DECISION LETTER APPENDICIES

1. **CZMA Application Materials**
    A. Project Overview & Detailed Timeline
    B. JCEP Federal Consistency Review Application & Exhibits List – April 12, 2019
    C. Applicable Enforceable Policies – August 1, 2019
2. **FERC Documentation**
    A. Oregon State Agency Scoping Comments on FERC's Notice of Intent to Prepare an Environmental Impact Statement for Docket No. PF 17-4-000 (Jordan Cove Energy Project LP and Pacific Connector Gas Pipeline LP)
    B. State of Oregon Cover Letter & Oregon State Agency Comments on DEIS - July 3, 2019
    C. JCEP Response to DEIS Comments – July 22, 2019
    D. FERC Endangered Species Act, Section 7 Biological Opinion – July 29, 2019
    E. State of Oregon Comments FERC Final Environmental Impact Statement for JCEP – December 23, 2019
    F. ODFW Supplemental FEIS Comments – February 5, 2020
    G. DEQ Supplemental FEIS Comments to FERC – February 10, 2020
3. **U.S. Army Corps of Engineers Application and Documentation**
    A. Joint Permit Application Cover Letter - October 23, 2017
    B. LNG Terminal Joint Permit Application
    C. Pacific Connector Pipeline Joint Permit Application
    D. U.S. Army Corps of Engineers Process Explanation Letter & Information Request – November 3, 2017
    E. U.S Army Corps of Engineers Environmental Data: JCEP Response – December 1, 2017
    F. U.S Army Corps of Engineers Public Notice Extension – July 17, 2018
4. **Local Land Use Information**
    A. LCOG Staff Report: Recommended Denial – August 13, 2019
    B. LUBA Appeal: OSCC vs. JCEP #2016-095
5. **DLCD Correspondence**
    A. CZMA Advisory – October 27, 2017
    B. JCEP Supplements to CZMA Application (project modifications) – May 6, 2019
    C. Review Initiated Letter – May 13, 2019
    D. 3-Month Notification and Information Request – July 12, 2019
    E. CZMA Public Notice – July 23, 2019
    F. JCEP Response to 3 Month Notification & Information Request – July 31, 2019
    G. Second Information Request & Clarification – August 15, 2019
    H. CZMA Information Response Tables – August 20, 2019
    I. Second Information Request Response from JCEP – August 23, 2019
    J. Letter to DOJ on CZMA Conditioning from JCEP – September 4, 2019
    K. Stay Agreement between DLCD and JCEP – October 7, 2019
    L. Conditioning Matrix & Memo, November 3, 2019
    M. Letter from JCEP to DLCD – December 20, 2019
    N. Response Letter to JCEP from DLCD - January 10, 2020 letter

O. Clarification Letter to JCEP from DLCD - January 29, 2020 letter

6. DEQ Correspondence

A. JCEP Application for DEQ 401 Water Quality Certification – February 6, 2018/ DEQ 401 Water Quality Certification Application Package – February 6, 2018
B. 401 Technical Memorandum - February 2, 2018
C. NPDES Permit Modification Application - January 31, 2019
D. DEQ 401 Water Quality Certification Denial – May 6, 2019
E. DEQ 401 Evaluation and Findings Report – Mary 2019

7. DSL Correspondence

A. DSL Removal-Fill Application – Part 1
B. DSL Removal-Fill Application – Part 2
C. Overview of Decision Process and Need for Additional Information Letter - April 10, 2019
D. DSL Denial of Extension for Removal-Fill Permit Review – January 21, 2020
E. JCEP Withdrawal of Removal-Fill Application – January 23, 2020
F. DSL Receipt of Withdrawal Removal-Fill and Proprietary Permit Applications – January 30, 2020
G. DSL Removal-Fill JCEP Review Timeline – January 30, 2020
H. DSL Redacted Removal-Fill Permit Findings

8. ODFW Correspondence

A. Comments to the City of Coos Bay, Comprehensive Plan Amendment 187-18-000153: Jordan Cove Energy Project Estuary Navigation and Reliability Improvements - August 27, 2019
B. Kentuck and APCO Fish passage Plan Submission – February 22, 2019
C. JCEP Fish Passage Plan – Temporary Bridge Installation at MP 44.29 – March 25, 2019
D. PCGP Fish Passage Plan – April 2019
E. ODFW Comments to Coos Bay Planning Commission - September 24, 2019
F. ODFW – Protest of BLM RMPA for JCEP – December 20, 2019
G. ODFW Jordan Cove Protest of USFS RLMP Amendment – January 6, 2020
H. ODFW Comments to DSL on Removal-Fill – January 15, 2020
I. ODFW Enforceable Policy Recommendation Letter – February 4, 2020

9. ODOE Correspondence

A. DOGAMI Comments Related to Geologic Hazards and JCEP - December 1, 2017
B. ODOE Withdrawal of Application for Exemption – April 12, 2019

10. Reports, Journal Articles, White Papers, and Supplemental Information

A. ODFW White Paper: 2019 ODFW Oregon Marbled Murrelet Habitat
B. Oregon Travel Impacts Report – June 2018
C. USCG Waterway Suitability Report – July 1, 2008
D. Site Selection and Design for LNG Ports and Jetties Information Paper No 14
E. LNG and Public Safety Issues Summary – 2015
F. Oregon Administrative Rule 660 Division 4 Approval

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F. Map 5: JCEP Estuary Project Map
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I. Map 8: JCEP LNG Facility Tsunami Hazard

12. Other Graphics & Tables

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13. FERC Documents

A. DEIS: https://www.ferc.gov/industries/gas/enviro/eis/2019/03-29-19-DEIS/03-29-19-DEIS.pdf
B. FEIS: https://www.ferc.gov/industries/gas/enviro/eis/2019/11-15-19-FEIS.asp

Federal Consistency Review of JCEP
Overview & Timeline

The following table outlines key dates associated with the Jordan Cove Energy Project Federal Consistency Review.

DATE	ITEM	APPENDIX REFERENCE
September 21, 2017	Federal application submitted the Federal Energy Regulatory Commission (FERC)	n/a
October 23, 2017	Initial notice of project from the U.S. Army Corps of Engineers	n/a
October 27, 2017	DLCD-OCMP Advisory Notice	5.A.
April 12, 2019	Federal Consistency Application Submitted from JCEP to DLCD	1.B.
May 6, 2019	Supplemental Resource Report – provided by JCEP to DLCD (project modification)	5.B.
May 13, 2019	DLCD Federal Consistency Review Initiation Notice	5.C.
July 12, 2019	Three Month Notice issued from DLCD to JCEP	5.D.
July 23, 2019	DLCD Issued 30 day Public Comment Notice	5.E.
July 31, 2019	JCEP Response to 3 Month Notification and Information Request	5.F.
August 1, 2019	Updated Applicable Enforceable Policies List Determined	1.C.
August 15, 2019	Additional Information request issued from DLCD to JCEP	5.G.
August 20, 2019	JCEP Response to Second Information Request - Table	5.H.
August 23, 2019	JCEP Response Summary to Second Information Request	5.I.
September 4, 2019	Letter from JCEP to Oregon DOJ Regarding Conditioning CZMA Federal Consistency Review	5.J.
September 21, 2019	DLCD Public Comment Period Closed on JCEP Application	5.E.
October 7, 2019	DLCD and JCEP Stay Agreement – Stay of CZMA Decision Deadline to February 28, 2020.	5.K.
November 4, 2019	Upon JCEP Request, Conditioning Memo and Matrix Provided to JCEP	5.L.
December 20, 2019	JCEP Letter of Concern sent to DLCD Directors Office	5.M.
January 10, 2020	DLCD Response Letter sent to JCEP (Responding to December 20, 2019 Letter)	5.N.
January 29, 2020	DLCD Clarification Letter sent to JCEP (clarifying January 10, 2020 Letter)	5.O.

Supplemental Coordination & Communication Timeline

The following dates are a **non-exhaustive** list of coordination efforts involving DLCD directly related to the Jordan Cove Energy Project Federal Consistency Review.

Phone Calls and Emails between JCEP and DLCD:

1. April 19, 2018
2. June 6, 2018
3. January 3, 2019
4. February 22, 2019
5. May 6, 2019
6. July 17, 2019
7. July 19, 2019
8. July 25, 2019
9. August 16, 2019
10. August 21, 2019
11. August 23, 2019
12. August 27, 2019
13. August 28, 2019
14. August 29, 2019
15. September 9, 2019
16. September 16, 2019
17. September 17, 2019
18. September 18, 2019
19. September 30, 2019
20. October 3, 2019
21. October 7, 2019
22. October 17, 2019
23. November 4, 2019
24. November 13, 2019
25. December 10, 2019
26. December 11, 2019
27. December 12, 2019
28. December 13, 2019
29. December 16, 2019
30. January 8, 2020
31. January 10, 2020
32. January 15, 2020

Meetings between JCEP and DLCD:

1. October 19, 2017
2. June 7, 2018
3. May 2, 2019
4. June 13, 2019
5. July 16, 2019

6. August 19, 2019 (Also Present: DSL, ODFW, DEQ, ODOE, OPRD, OWRD, DOJ)
7. September 5, 2019 (Also Present: DSL, ODFW, DEQ, ODOE, OPRD, OWRD, DOJ)
8. October 1, 2019
9. October 7, 2019
10. November 5, 2019
11. November 15, 2019
12. December 11, 2019
13. January 22, 2020 (Also Present: DOJ, DEQ)

Letters from JCEP

1. July 31, 2019 Response to Three-month Notification and Information Request dated July 12, 2019
2. August 20, 2019 Responses to First and Second Information Requests
3. August 23, 2019 Jordan Cove Response Summary and Response to DLCD's August 15, 2019 Second Information Request
4. September 4, 2019 to the Oregon Attorney General
5. December 20, 2019 to DLCD

Letters from DLCD, State Agency Partners, & the State of Oregon

1. October 27, 2017 from DLCD
2. May 13, 2019 from DLCD
3. July 12, 2019 from DLCD
4. August 15, 2019
5. September 6, 2019 from Oregon Attorney General
6. November 4, 2019
7. January 10, 2020 from DLCD
8. January 21, 2020 from DSL
9. January 29, 2020 from DLCD
10. January 30, 2020
11.

Tribal-State Agency Coordination Meetings

1. April 29, 2019
2. June 24, 2019
3. October 3, 2019
4. December 2, 2019

State and Federal Agency Partner Meetings

1. May 15, 2018 (DLCD, ODFW)
2. January 3, 2019 (DLCD, DOJ)
3. February 7, 2019 (DLCD, ODOE, DSL, DEQ, OWRD, RST, SHPO, DOJ, ODFW, DOGAMI, ODOT)
4. March 1, 2019 (DLCD, DOJ)
5. March 26, 2019 (DLCD, ODFW)
6. April 29, 2019 (DLCD, ODOE, DSL, DEQ, OWRD, RST, SHPO, DOJ, ODFW, DOGAMI, ODOT)
7. July 16, 2019 (DLCD, DOJ)

8. July 24, 2019 (DLCD, DEQ)
9. August 8, 2019 (DLCD, DOJ)
10. August 19, 2019 (DLCD, DOJ)
11. August 26, 2019 (DLCD, DOJ, NOAA OCM)
12. August 29, 2019 (DLCD, DOJ)
13. September 9, 2019 (DLCD, NOAA)
14. September 16, 2019 (DLCD, ODOE, DSL, ODFW, DOJ)
15. September 19, 2019 (DLCD, DOJ)
16. October 3, 2019 (DLCD, DOJ, ODOE, DEQ, DSL, ODFW, OWRD, OPRD)
17. October 17, 2019 (DLCD, ODFW)
18. October 25, 2019 (DLCD, DEQ)
19. November 4, 2019 (DLCD, DOJ)
20. November 5, 2019 (DLCD, DOJ)
21. November 14, 2019 (DLCD, DOJ)
22. December 2, 2019 (DLCD, DOJ, ODOE, DEQ, DSL, ODFW OWRD, OPRD)
23. December 3, 2019 (DLCD, DSL, DOJ)
24. January 2, 2020 (DLCD, DOJ)
25. January 16, 2020 (DLCD, DOJ)
26. January 29, 2020 (DLCD, DOJ)

APPENDIX 1.B.

Jordan Cove LNG LLC
5615 Kirby, Suite 500
Houston, Texas
77005
T: (713) 400-2800

www.jordancovelng.com
A Veresen Inc. company

April 12, 2019

VIA ELECTRONIC AND IN PERSON DELIVERY

Ms. Elizabeth Ruther
Oregon Department of Land Conservation and Development
635 Capitol Street, NE, Suite 150
Salem, OR 97301-2540

Re: Jordan Cove Energy Project and Pacific Connector Gas Pipeline's Joint Coastal Zone Management Act Certifications and Necessary Data and Information

Dear Ms. Ruther:

Jordan Cove Energy Project L.P. and Pacific Connector Gas Pipeline, LP ("Applicants") hereby submit their Joint Coastal Zone Management Act Certifications and Necessary Data and Information to the Oregon Department of Land Conservation and Development. Please find enclosed the application narrative. Exhibits can be found on the ShareFile link provided via email.

The Applicants believe that the activities described in the attached materials comply with and be conducted in a manner consistent with the Oregon Ocean and Coastal Management Program. We look forward to continued coordination with the Oregon Department of Land Conservation and Development throughout the application process. Should you have any questions please contact me at neades@pembina.com or (832) 255-3841.

Very truly yours,

Natalie Eades

Natalie Eades
Jordan Cove Energy Project L.P.
Pacific Connector Gas Pipeline, LP

Enclosure

Cc: Steven Shipsey (with enc.) (via email)
Jesse Ratcliffe (with enc.) (via email)
Patty Snow (with enc.) (via email)

JORDAN COVE ENERGY PROJECT

and

PACIFIC CONNECTOR GAS PIPELINE

JOINT COASTAL ZONE MANAGEMENT ACT CERTIFICATIONS AND NECESSARY DATA AND INFORMATION

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Table 3 Changes to Identified Enforceable Policies Post-Oregon Coastal Management Plan Approval

EXHIBITS

Exhibit A Copy of Consistency Certification to FERC

Exhibit B Applications to FERC
- Exhibit B.1 JCEP Resource Reports
- Exhibit B.2 PCGP Resource Reports

Exhibit C Draft NEPA Documents
- Exhibit C.1 DEIS

Exhibit D Corps Section 404 Application and Consistency Certification
- Exhibit D.1 Part 1 - JCEP
- Exhibit D.2 Part 2 - PCGP
- Exhibit D.3 Copy of Consistency Certification to the Corps

Exhibit E DSL Removal-Fill Application
- Exhibit E.1 Part 1 - JCEP
- Exhibit E.2 Part 2 - PCGP

Exhibit F DSL Proprietary Authorizations

Exhibit G DEQ 401 Water Quality Certification Package
- Exhibit G.1 Supplemental information, Feb. and May, 2018
- Exhibit G.2 Supplemental Information, Sept. 2018
- Exhibit G.3 Supplemental information, Nov. 2018

Exhibit H DEQ Type B State New Source Review (NSR) Air Contaminant Discharge Permit Application

Exhibit I DEQ Construction Stormwater NPDES 1200-C Permit Applications
- Exhibit I.1 Pipeline 1200-C Application
- Exhibit I.2 Kentuck 1200-C Application
- Exhibit I.3 TPP/101 1200-C Application
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- Exhibit I.5 Terminal 1200-C General Permit

Exhibit J DEQ Wastewater Discharge Permit
- Exhibit J.1 NPDES Wastewater Permit No. 101499
- Exhibit J.2 Application for NPDES Permit Modification, Jan. 2019

Exhibit K ODFW Fish Passage Plan Approval Applications
- Exhibit K.1 Application for Kentuck and APCO Bridge
- Exhibit K.2 Application for Access Road-Stream Crossing
- Exhibit K.3 Application for Pipeline Crossings within coastal zone
- Exhibit K.4 Summary of Communications with ODFW

Exhibit L Coos County Permits and Applications
- Exhibit L.1 PCGP Early Works
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- Exhibit L.3 JCEP NRIs
- Exhibit L.4 JCEP Omnibus I
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- Exhibit L.6 PCGP Original Route
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Exhibit M Douglas County Permit Applications
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Exhibit N City of North Bend Permit Applications
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- Exhibit N.2 JCEP APCO Dredge Disposal Activities

Exhibit O City of Coos Bay Permit and Application
- Exhibit O.1 Zoning Verification - Eelgrass Mitigation
- Exhibit O.2 JCEP NRIs

Exhibit P OWRD Limited Water Use License Applications
- Exhibit P.1 Application for Limited Water Use License - Coos River
- Exhibit P.2 Application for Limited Water Use License - East Fork Coquille River
- Exhibit P.3 Application for Limited Water Use License - Middle Fork Coquille River

Exhibit Q Correspondence with EFSC

Exhibit R SHPO Archeological Permits
- Exhibit R.1 LNG Terminal Permits

  Permit AP# 1806 for Industrial Wastewater Pipeline survey along TPP, 2013
  Permit AP# 1807 for Site 35CS221 Investigations, 2013
  Permit AP #2048 for Chappell Parkway Testing, 2015
  Permit AP# 2359 for Geoarchaeological Deep Testing, 2017
  Permit AP# 2507 for APCO Deep Testing in 2018
  Permit AP# 2508 for Roseburg Forest Products Deep Testing in 2018
  Permit AP# 2509 for Boxcar Hill Deep Testing in 2018
  Permit AP# 2512 for Site 35CS263 Investigations in 2018
  Permit AP #2513 for Site 35CS324 Investigations in 2018
  Permit AP #2514 for Site 35CS327 Investigations in 2018
  Permit AP #2518 and #2519 for Site 35CS326 Investigations, 2018
  Permit AP #2520 for site 35CS261 Investigations, 2018 (w/email)
  Permit AP #2539 for KBJ Geotechnical Investigations Archaeological Monitoring, 2018
  Permit AP #2540 for East Bay Bridge Archaeological Excavation, 2018
  Permit AP# 2629 for East Bay Road, 2019
- Exhibit R.2 Pipeline Permits

  Permit AP #980 for 35DO1053 Phase II testing, 2007
  Permit AP #1004 for 35DO313 Phase II testing, 2007
  Permit AP #1005 for 35DO1074 Phase II testing, 2007
  Permit AP #1006 for 35DO1075 Phase II testing, 2007
  Permits AP #1162, AP #1163 for 35DO1092 Phase II testing, 2008
  Permit AP #1750 for Phase I Survey, 2013
  Permit AP #1792 for 35CS26 Deep Testing/Site Identification, 2013
  Permit AP #2122 for 35CS226 Phase II testing, 2015
  Permit AP #2532 for North Point Phase II/Deep Testing (amended), 2018
  Permit AP #2545 for North Point Phase II Testing/Deep Testing, 2018
  Permit AP #2592 for North Point Phase II Testing/Deep Testing, 2018
- Exhibit R.3 Cultural Resources Protection Agreement and Unanticipated Discovery Plan

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Exhibit S Substantially Complete List of Enforceable Policies from DLCD

Exhibits supporting the Application have been provided to DLCD electronically. The Applicant will provide supplemental filings with authorizations as they are received.

1. PROJECT OVERVIEW

On September 21, 2017, Jordan Cove Energy Project L.P. ("JCEP") filed an application pursuant to Section 3(a) of the Natural Gas Act ("NGA"), as amended,[1] and Parts 153 and 380 of the regulations of the Federal Energy Regulatory Commission ("FERC" or the "Commission"),[2] for authorization to site, construct, and operate certain liquefied natural gas facilities ("LNG Terminal"). On the same day, Pacific Connector Gas Pipeline, LP ("PCGP") filed an application pursuant to Section 7(c) of the NGA,[3] and Parts 157 and 284 of the Commission's regulations,[4] for a certificate of public convenience and necessity authorizing PCGP to construct, install, own, and operate a new natural gas pipeline ("Pipeline"). JCEP and PCGP are together referred to as "Applicants." The Pipeline and the LNG Terminal are together referred to as the "Project." The Project requires federal licenses and permits, and because the Project is located within Oregon's coastal zone (or, in the case of the Pipeline, the portion located within the coastal zone), it is subject to consistency review by the State of Oregon under the federal Coastal Zone Management Act, 16 U.S.C. § 1451("CZMA").

The CZMA requires that federal agency activities affecting any use or resource of a state's coastal zone must be consistent with the enforceable policies of the State's federally approved coastal management program. The Department of Land Conservation and Development ("DLCD") is the designated state agency that implements the Oregon Coastal Management Program ("OCMP") and undertakes the CZMA consistency review in Oregon. To coordinate and simplify public review and comment of the CZMA consistency review process, DLCD has asked Applicants to combine their CZMA submissions into one document so that they can be reviewed through a single public process. This document, along with exhibits provided to the DLCD as documented in (together, the "Application"), consolidate materials for that review. Consolidated review is provided consistent with applicable National Oceanic and

[1] 15 U.S.C. § 717b(a) (2012).
[2] 18 C.F.R. Pts. 153 and 380 (2017).
[3] 15 U.S.C. § 717f (2012).
[4] 18 C.F.R. Pts. 157 and 284.

Atmospheric Administration ("NOAA") regulations, 15 C.F.R. § 930.59(a), which is the federal agency charged with implementing CZMA.

1.1 SUMMARY OF PROJECT COMPONENTS

Each component of the Project is summarized at an introductory level in this Section 1.1. Each component is then described more fully in its own section: Section 2 (LNG Terminal) and Section 3 (Pipeline). In addition, those Sections include Applicants' certifications of consistency as well as the necessary data and information ("NDI") for consistency review.

1.1.1 LNG Terminal

JCEP proposes to construct the LNG Terminal on the bay side of the North Spit of Coos Bay, Oregon. The LNG Terminal will be capable of receiving and liquefying 1.2 million dekatherms per day ("Dth/d") of natural gas, producing a maximum of 7.8 million metric tons per annum ("mtpa") of liquefied natural gas ("LNG") for export, storing the LNG in two 160,000 cubic meter full-containment storage tanks, and loading the LNG onto LNG carriers for delivery to Asian markets. The LNG Terminal includes a marine terminal slip containing two berths - a berth for LNG carriers and an emergency lay berth for disabled vessels and an access channel (together with the marine slip, the "Slip") connecting the Slip to the Coos Bay Navigation Channel ("Channel"). The LNG Terminal also includes minor enhancements to the Channel to improve navigation reliability and enhance safety ("NRIs").

Associated facilities and components to support the LNG Terminal include the placement of dredged material disposal ("DMD") at APCO, which is a parcel of land owned by the Applicants in the City of North Bend. The DMD has supporting infrastructure such as temporary dredge lines to move the material from the NRIs to APCO, a bridge at APCO, and construction laydown facilities at APCO. JCEP proposes to create an eelgrass mitigation site, which is located within the City of Coos Bay, and a wetlands mitigation project at Kentuck, which is in Coos County jurisdiction. Intersection improvements are proposed at the junction of Highway 101 and Trans Pacific Parkway. This includes a proposed asymmetrical widening to the north to

facilitate two additional turn lanes. JCEP has requested land use authorizations for all necessary components at the LNG Terminal site which are detailed in two land use applications: Omnibus I and Omnibus II. The LNG Terminal site is shaped like a dumbbell with the LNG processing components located on the western side and administrative buildings, temporary workforce housing, and the pipeline metering station on the eastern side, with a utility and access corridor connecting the eastern and western parcels. The access corridor generally contains a roadway, utilities, and a pipeline.

The LNG Terminal requires two authorizations that are listed federal license or permit activities in the OCMP subject to consistency review: (1) an order from the FERC pursuant to Section 3 of the NGA, 15 U.S.C. § 717b, to site, construct, and operate a natural gas liquefaction and export facility; and (2) a permit from the United States Army Corps of Engineers ("Corps") under Section 10 of the Rivers and Harbors Act, 33 U.S.C. § 403, for work in or affecting navigable waters of the United States and under Section 404 of the Clean Water Act, 33 U.S.C. § 1344, for discharges of dredged or fill material into waters of the United States.

1.1.2 Pacific Connector Gas Pipeline

PCGP proposes to construct and operate the Pipeline, an approximately 229-mile, 36-inch-diameter interstate natural gas transmission system and related facilities. The Pipeline will be capable of transporting 1.2 million Dth/d of natural gas from a point of origin near the intersection of two existing interstate natural gas pipelines (Ruby Pipeline LLC ("Ruby") and Gas Transmission Northwest LLC ("GTN")) to the proposed LNG Terminal. The Pipeline will include a new compressor station, three new meter stations, five new pig launcher/receiver units, 17 new mainline block valves, and communications towers and equipment buildings.

The Pipeline requires two authorizations that are listed federal license or permit activities in the OCMP subject to consistency review: (1) a Certificate of Public Convenience and Necessity under Section 7 of the NGA, 15 U.S.C. § 717f, from FERC to construct and operate an interstate natural gas pipeline; and (2) a permit from the Corps under Section 10 of the Rivers

and Harbors Act, 33 U.S.C. § 403, for work in or affecting navigable waters of the United States and under Section 404 of the Clean Water Act, 33 U.S.C. § 1344, for discharges of dredged or fill material into waters of the United States relating to the portion of the Pipeline within the coastal zone.

1.2 CZMA REQUIREMENTS

The CZMA requires that applicants for federal license and permit activities affecting any use or resource of a state's coastal zone must submit to the permitting agency a certification that the activity is consistent with the enforceable policies of the relevant state's coastal zone management program. The applicant must also furnish a copy of that certification to the state, along with the "necessary data and information" required by the state for its consistency analysis. As noted above, this filing for the Project combines the certifications and NDI submissions made by Applicants for the Project into a consolidated document for ease of public review.

The Corps directed JCEP and PCGP to combine their respective applications for Corps permits into a single application. Applicants did so, submitting that application on October 23, 2017 ("2017 Corps Application"). *See* Ex. B. The 2017 Corps Application describes impacts associated with the Project. JCEP and PCGP submitted separate applications to FERC under Sections 3 and 7 of the Natural Gas Act in September 2017. *See* Exs. B.1 and B.2.

Pursuant to 15 C.F.R. § 930.58, Applicants must submit the information set forth in this Section 1.2 in support of their certification of consistency, and pursuant to 15 C.F.R. § 930.60, DLCD has 30 days to advise of any missing information.

1.2.1 A copy of the application for the federal license or permit

NOAA's regulations governing the CZMA consistency certification process require Applicants to supply a copy of the application for the federal permit or license. 15 C.F.R. § 930.58(a). Copies of the applications for the relevant FERC certificates and Corps permits are included as Exhibits B and D hereto.

1.2.2 All material relevant to a state's management program provided to the federal agency in support of the application

NOAA regulations also require that consistency certifications include all material relevant to a state's management program provided to the federal agencies in support of the applications. 15 C.F.R. § 930.58(a)(1)(i). As set forth *infra*, these materials are included in this Application and the Exhibits hereto.

1.2.3 To the extent not provided pursuant to the above, a detailed description of the proposed activity, its associated facilities, the coastal effects, and any other information relied upon by the applicant to make the certification that "[t]he proposed activity complies with the enforceable policies of the Oregon Coastal Management Program and will be conducted in a manner consistent with such program"

NOAA regulations also require a detailed description of the proposed activity, its associated facilities, the coastal effects, and any other information relied upon by the applicant to make the consistency certification. 15 C.F.R. § 930.58(a)(1)(ii). The information necessary for DLCD to make the required certification is included in this Application and the Exhibits hereto. See discussion *infra* in Section 1.2.5.

1.2.4 Information specifically identified in the management program as required necessary data and information for an applicant's consistency certification

This combined submittal includes all necessary data and information for DLCD to perform its 30-day review and to commence the CZMA statutory six-month review period for the Project.

DLCD staff and Applicants' representatives have consulted to review the Project and identify applicable enforceable policies and the relevant state authorities listed in the OCMP. DLCD shared an Oregon Department of Energy ("ODOE") memorandum, "Oregon State Agency Reviews for the Jordan Cove Energy Project and Pacific Connector Gas Pipeline," with Applicants during a meeting on October 19, 2017, as a tentative list. Following that meeting, Applicants and state and local agencies continued to coordinate regarding applicable permits. ODOE then published a revised version of the memorandum on January 8, 2018 on ODOE's

website. Applicants provided a draft CZMA application narrative to DLCD on April 19, 2018. DLCD provided written comments on the draft application on June 6, 2018. Applicants' representatives and DLCD staff met on June 7, 2018 to review DLCD staff's comments. On February 22, 2019, DLCD provided a substantially complete list of the enforceable policies of the OCMP applicable to the Project. A copy of that list is provided as Exhibit S.

Applicants consulted both versions of the ODOE memorandum, DLCD staff comments, and the DLCD-provided list of applicable enforceable policies in preparing this Application and compiling the list of relevant state and local authorities listed below.

Local Land Use:

- Coos County comprehensive plan, Coos Bay Estuary Management Plan, and land use ordinance (limited to LNG Terminal and portion of the Pipeline within Coos County)
- City of North Bend comprehensive plan and land use ordinance (limited to LNG Terminal and Pipeline HDD/Early Works)
- City of Coos Bay comprehensive plan and land use ordinance (limited to eelgrass and the NRIs)
- Douglas County comprehensive plan and land use ordinance (limited to Pipeline in Coastal Zone)

Networked State Agency Authorities:

- <u>Oregon Department of Environmental Quality</u>
  - Type B State NSR application for a Standard Air Contaminant Discharge Permit (limited to LNG Terminal)
  - 401 Water Quality Certification (limited to LNG Terminal and Pipeline in Coastal Zone)
  - NPDES 1200-C Construction Stormwater General Permits (limited to: (1) LNG Terminal site, (2) Kentuck Slough mitigation site, (3) the North Point site, and (4) Pipeline in Coastal Zone)
  - NPDES Wastewater Discharge Permit (limited to LNG Terminal)

- Oregon Department of State Lands
  - Removal-Fill Permit (limited to LNG Terminal and Pipeline in Coastal Zone)
  - Proprietary Authorizations (limited to LNG Terminal and Pipeline in Coastal Zone)
- Oregon Water Resources Department
  - Limited Water Use Licenses (limited to Pipeline in Coastal Zone)
- Oregon Department of Fish and Wildlife
  - Department Consultation
  - Fish Passage Authorizations (limited to Pipeline, road crossings, Kentuck, and APCO in Coastal Zone)
  - In-Water Blasting Permit (limited to Pipeline in Coastal Zone)
- Oregon State Historic Preservation Office
  - Archeological Permits (limited to LNG Terminal and Pipeline in Coastal Zone)
- Oregon Department of Agriculture
  - Department Consultation

This combined submittal includes as Exhibits copies of applications that have been submitted for the relevant state and local authorities listed above, and copies of the permits where they have been granted. In some circumstances, where permit applications cannot yet be filed due to specific timing requirements (for example, limited water use licenses must be submitted during the water year the water is to be used), Applicants have submitted substantially complete copies of the permit applications to be filed with the respective agency in the future. As those permit applications are filed and permits are issued, Applicants will submit those applications and approvals to DLCD as supplements to this Application.

1.2.5 An evaluation that includes a set of findings relating the coastal effects of the proposal and its associated facilities to the relevant enforceable policies of the management program

Under the CZMA, applicants must "demonstrate that the activity will be consistent with the enforceable policies of the management program[,]" showing "adequate consideration of policies which are in the nature of recommendations." 15 C.F.R. § 930.58(a)(3). According to the *1987 Oregon Coastal Management Program*, the enforceable policies of the OCMP include: (1) Oregon's Statewide Planning Goals, (2) the applicable acknowledged county or city comprehensive plans and land use regulations, and (3) selected state authorities (*e.g.*, the Oregon Department of State Lands, the Oregon Department of Fish and Wildlife, the Oregon Department of Environmental Quality, etc.).[5] See list of enforceable policies at Exhibit S.

This Application addresses consistency with the applicable enforceable policies of the OCMP in Tables 1, 2, and 3 of this Application. Table 1.1 sets forth the applicable local land use authorizations and authorization applications required for the Project, and Table 1.2 demonstrates how the Project, through these authorizations, will comply with the applicable OCMP enforceable policies implemented by Statewide Planning Goals and county and city comprehensive plans and land use regulations. Table 2 details the OCMP enforceable policies implemented by applicable provisions of the Oregon Revised Statutes ("ORS") and administered by the aforementioned networked state agencies, and provides narratives and references to the pertinent state permits, permit applications and consultations demonstrating consistency with those enforceable policies.

Most of the enforceable policies of the OCMP are implemented through prior editions of the corresponding land use authorities or ORS. *See* Ex. S. For example, the 2013 edition of ORS Ch. 196 is approved in the OCMP. Because the relevant land use approvals and permits required for the Project are sufficient to demonstrate compliance with only the *current* edition of these standards, not the editions approved in the OCMP, it is necessary to address any changes to the

[5] 1987 OCMP, Section II and Appendix.

applicable enforceable policies that have occurred since the date approved in the OCMP to the date the permits or permit applications were sought. Therefore, Table 3 identifies and summarizes any changes to the applicable enforceable policies of the OCMP since the date of approval to present. Any changes and the Project's consistency with the approved edition of the enforceable policies are discussed and addressed in turn throughout Tables 1.2 and 2. Together, these tables demonstrate that the Project complies with the enforceable policies of the OCMP and will be conducted in a manner consistent with the program.

1.2.6 Conditioning of CZMA Certification

To demonstrate consistency with the DLCD-identified enforceable policies of the OCMP, Applicants will need to obtain § 1200-C Construction Stormwater Permits from the Oregon Department of Environmental Quality and Limited Water Use Licenses from the Oregon Water Resources Department. These ministerial authorizations are issued close in time to the commencement of construction, because it is difficult, if not impossible, to secure these permits prior to pre-construction final engineering. Issuance of these permits in close temporal proximity to construction is a routine — and for the Limited Water Use Licenses, required — agency practice.

15 C.F.R. § 930.62(d) provides that during the period when the State agency is reviewing CZMA consistency certification, "the applicant and the State agency should attempt, if necessary, to agree upon conditions, which, if met by the applicant, would permit State agency concurrence." *See also* 15 C.F.R. § 930.4 (providing for State "conditional concurrence"). Applicants will continue to engage with networked state permitting agencies to obtain and file "substantially complete" permit applications, and requests that DLCD find consistency, conditioned upon pre-construction issuance of these permits. Additional detail is provided infra in Table 2.

2. LIQUEFACTION PLANT AND LNG EXPORT TERMINAL CERTIFICATIONS AND NECESSARY DATA AND INFORMATION

2.1 CERTIFICATIONS

2.1.1 Certification to FERC regarding the Liquefaction Plant and LNG Export Terminal

A copy of JCEP's coastal zone consistency certification to FERC is provided as Exhibit A.

2.1.2 Certification to Corps regarding the Liquefaction Plant and LNG Export Terminal

A copy of JCEP's coastal zone consistency certification to the Corps is provided as part of the 2017 Corps Application, which is provided in relevant part as Exhibit D.3.

2.2 LIQUEFACTION PLANT AND LNG EXPORT TERMINAL NECESSARY DATA AND INFORMATION

2.2.1 Project Description

2.2.1.1 Summary of Facilities

The LNG Terminal will be capable of receiving natural gas from the Pipeline, processing the gas, liquefying the gas into LNG, storing the LNG, and loading the LNG onto ocean-going carriers at its marine dock. The LNG Terminal will be designed to receive a maximum of 1.2 million Dth/d of natural gas and produce a maximum of 7.8 mtpa of LNG for export. It is anticipated that approximately 110-120 LNG carriers per year will be required to transport the LNG from the LNG Terminal based on the estimated size of the LNG carriers expected to call upon the facility.

The facilities at the LNG Terminal include:

Gas Inlet and Gas Conditioning Facilities:

- a connection to the Pipeline metering station;
- gas inlet facilities; and

- a gas conditioning train, consisting of mercury removal via sulfur-impregnated activated carbon, carbon dioxide and other acid gases removal via an amine system, and dehydration via a molecular sieve adsorbent system.

Liquefaction Facilities:

- five liquefaction trains using the PRICO® LNG process (a Black & Veatch proprietary technology);
- gas turbine driven refrigeration, including a single-body, two-stage refrigerant compressor for each liquefaction train;
- waste heat recovery system from the gas turbines;
- heavy hydrocarbon removal units; and
- LNG expander, LNG flash drum, and boil-off gas ("BOG") system.

LNG Storage:

- two full-containment, seismic-isolated LNG storage tanks, each designed for a working capacity of 160,000 m^3.

LNG Loading and Marine Facilities:

- LNG loading line and LNG loading facilities;
- two LNG carrier berths, an emergency lay berth, and a product loading berth, each consisting of a sheet pile wall, mooring structures, and breasting structures;
- material offloading facility for delivery of LNG Terminal components that are too large or heavy to be delivered by road or rail, constructed using a sheet pile wall system; and
- access channel for approximately 110-120 LNG carriers annually connecting the slip to the Channel at approximately Channel Mile 7.3.

Terminal Utility (Support) Systems:

- two BOG compressor trains feeding the fuel gas system, one operating continuously to handle holding mode BOG volumes and the second only needed during loading mode or during an off-design condition that results in increased BOG generation;

- steam system providing heat for the gas conditioning systems and utility power generation;
- control systems including an operations building;
- safety systems that include flare and facility shutdowns;
- utility, potable water, and fire water systems; and
- the use of instrument air, utility air, and nitrogen.

Navigation Reliability Improvements:

- four submerged areas lying adjacent to the Channel that will be dredged to allow for transit of LNG vessels under a broader weather window.

Additional information regarding all of these facilities is provided below.

All facilities will be constructed in accordance with governing regulations, including the regulations of the United State Coast Guard ("USCG") for Liquefied Natural Gas Waterfront Facilities, 33 C.F.R. Part 127; the U.S. Department of Transportation Federal Safety Standards for Liquefied Natural Gas Facilities, 49 CFR Part 193; and the National Fire Protection Association Standard 59A for LNG facilities and the codes and standards referenced therein.

Development of the liquefaction plant will occur almost entirely within upland areas. Minor wetland impacts in the northern portion of the liquefaction plant will occur as a result of the need to place surplus fill material on land owned and/or controlled by JCEP. The export terminal will be located on the east side of the slip. The export terminal will be developed on both upland and estuarine areas. Installation of the LNG loading arm and associated equipment will occur entirely on upland areas and will not result in any wetland or other aquatic impacts. The placement of fill for installation of the barge berth will result in some impacts to estuarine resources.

Access to the marine slip will be via a newly constructed access channel that will connect the slip to the Channel at approximate Channel Mile 7.3 at the beginning of the confluence between the Jarvis Turn and the Upper Jarvis Range A. The access channel will flare from the narrowest portion at the mouth of the slip, with a minimum width of 780 feet, to the intersection

with the Channel with an approximate width of 2,200 feet. The proposed access channel will allow for the safe transit of vessels between the berth and the Channel, and allow the safe turning of vessels during an inbound transit so that the LNG carrier can be backed into the slip and berthed bow out, according to industry best practice standards.

The total access channel would cover approximately 22 acres below the Highest Measured Tide elevation of 10.26 feet (NAVD88). The walls of the access channel would be sloped to meet the existing bottom contours at an angle of approximately 3 feet horizontal to 1 foot vertical (3:1). The marine slip and access channel will have a minimum depth of -45 feet below the mean lower low water ("MLLW" (-45.97 feet NAVD 88)) to ensure minimum under-keel clearance is achieved for the safe maneuvering and berthing of loaded LNG carriers. An allowance over and above the minimum depth will be made for advanced maintenance dredge and incidental over-dredge, in accordance with industry best practices. Dredging of the access channel would affect about 15 acres of currently existing deep subtidal area below -15.3 feet in depth below MLLW.

The new marine slip will be constructed by excavating an existing upland area. The majority of the marine slip will be excavated from existing uplands owned by JCEP. Part of the marine slip would be constructed within state waters of Coos Bay to the MLLW line, for which JCEP will obtain an easement from the Oregon Department of State Lands (ODSL). The slip will be bounded on the east and west sides by sheet pile walls, creating a vertical face to support mooring structures. The northern side of the slip will be sloped to meet the existing bottom contours at an angle of 3 feet horizontal to one foot vertical (3:1). The inside dimensions at the toe of the slope of the slip will measure a minimum of 800 feet between the vertical sheet pile walls along the east/west axis, and approximately 1,500 feet and 1,200 feet along the western and eastern boundaries, respectively. The slip is sized to provide the flexibility needed to safely maneuver an LNG carrier from the access channel into the slip when another LNG carrier is already berthed on the east or west sides and for tugs to move a temporarily disabled LNG vessel

away from the loading berth on the east side of the slip to the emergency lay berth on the west side of the slip if necessary.

The physical berth will be constructed of steel sheet piles to support surface structures (*i.e.*, the loading area) or provide the foundation for the breasting and mooring structures. Under the loading facility, the wall will extend from the bottom of the slip at elevation -45.97 (minimum) to approximate elevation +34.5 (NAVD88). This face will extend north and south to capture the outermost breasting structures and then turn to the east, creating a setback wall for the remainder of the slip. Mooring and breasting structures will be provided at both the loading berth and the emergency lay berth for the safe breasting, berthing, and mooring of the LNG carriers docked at either berth. Six mooring structures (three on each side of the LNG berth centerline) will be used to secure the LNG carrier at both the LNG loading berth and the emergency lay berth. The structures will be behind the sheet pile wall, set back approximately 145 feet from the face of each berth. These structures will have concrete platforms founded on steel pilings and will each have remote release mooring hooks with capstans, as well as all required equipment and instrumentation for safe mooring operations.

Four breasting structures will be located adjacent to the product loading facility ("PLF"): two north of the PLF and two south of the PLF. Like the mooring structures, each breasting structure will have a concrete platform founded on steel pilings and will have remote release mooring hooks with capstans, as well as all required equipment and instrumentation for safe mooring operations. Each breasting structure will also support a fender assembly sized to absorb and distribute berthing and mooring loads for the full range of LNG carriers that the LNG berth is designed for, thus preventing damage to the LNG carriers or the LNG berth. The fender system will allow the carriers to be moored a safe distance off the vertical face of the sheet pile wall. The emergency lay berth will have four breasting structures with fenders and capstans spaced equally about the mid-ship. There will be additional breasting fender structures, two to the north and two to the south of the main breasting structures, for a total of eight. The exact number, type, and location of the breasting structures for the emergency lay berth will be defined

during detail design to meet Oil Companies International Marine Forum requirements for non-parallel vessel approach and the full range of vessel sizes.

The PLF utilizes a pile-supported concrete slab that provides structural support to the marine loading arms, terminal gangway, and other ancillary equipment. The PLF is designed to support a number of elements that facilitate the safe transfer of LNG product between the LNG facility and the LNG carriers. The PLF will be constructed on top of the sheet pile wall at approximate elevation +34.5, and will be about 130 feet long and 86 feet wide. The foundation will be reinforced concrete supported by steel pilings.

The transfer equipment consists of four marine loading arms and ancillary equipment. There will be two dedicated liquid loading arms, one hybrid arm, and one ship vapor return arm to meet the design loading rate of 12,000 m^3/h. The hybrid arm will be designed for dual service capable of transferring LNG to the LNG carriers or returning vapor from the LNG carriers to the BOG vapor management system. During normal operation the hybrid arm will be used in liquid service along with the two liquid arms, and the vapor return arm will be used to return vapor to the BOG vapor management system.

An emergency lay berth on the west side of the slip will be provided with facilities to safely moor a temporarily disabled LNG carrier. Berthing facilities will be supported by the west side sheet pile wall with a top-of-wall elevation of approximately +20 feet (NAVD 88). The lay berth will have pile-supported breasting structures with fenders extending above the vertical sheet pile and mooring structures on the land side of the sheet pile. A grated platform with a gangway will be placed behind the berthing breasting structures to allow for safe access and egress from the disabled LNG carrier at berth. Support infrastructure will include an access road down from the area of the tug berth building, duct bank with cabling for powering the mooring hooks and capstans, and limited lighting of the ship access area.

Along the western property line, a tsunami flow control wall will be constructed. The flow control wall shall be of sufficient height and strength to prevent overtopping into the buffer zone and limit the drag due to the tsunami current loads on LNG carriers within the marine slip.

The wall height shall be approximately 34.5 feet and determined in accordance with the design tsunami criteria. The wall will run from the southwest side of the LNG tank impoundment area down to the entrance to the slip.

The Marine Off-Loading Facility ("MOF") will be constructed to deliver components of the LNG Terminal that are too large or heavy to be delivered by road or rail. The MOF will cover about 3 acres on the southeast side of the slip, adjacent to Roseburg Forest Products. The MOF will be constructed using the same sheet pile wall system as the LNG loading berth and the emergency lay berth. The top of the MOF will be at elevation approximately +13.0 feet (NAVD88), and the bottom of the exposed wall will be at the access channel elevation. The MOF will provide approximately 450 feet of dock face for the mooring and unloading of a variety of vessel types. During construction of the LNG Terminal, in addition to receiving equipment and large modules (upwards of 6,000 short tons) by break bulk cargo carriers, roll on roll off cargo carriers, and barges, the MOF will allow other bulk materials to be delivered by sea to minimize impacts on the local road network. After project construction, the MOF will be retained as a permanent feature of the LNG Terminal to support maintenance and replacement for large equipment components that are too large to be transported by rail and road.

The tug berth at the north side of the marine slip will accommodate four tugboats, as well as two sheriff's boats and six other visitor boats with similar characteristics as the sheriff's boats. For design purposes, the tugs are assumed to be 80-metric-ton bollard pull boats approximately 100 feet long with a beam of 40 feet. The basis for the sheriff's boat is the Willard USCG Long Range Interceptor. The tug dock will generally be about 470 feet long and 18 feet wide; in addition, there is 360 feet of 8-foot-wide floats for mooring and accessing the security vessels. The tug dock will be concrete supported by steel piles. The security vessel docks will be precast concrete floats anchored by steel pile. The security boat dock will support two separate boat houses. The tug dock will be accessible from land by a pile-founded trestle, thus allowing vehicle and pedestrian access for service and support of operations. An onshore tug operations

building will provide storage, meeting, and sanitary facilities for the crews of the tug and security boats.

JCEP plans to excavate four submerged areas lying adjacent to the federally authorized Channel. These minor enhancements will allow for transit of LNG vessels under a broader weather window, as confirmed in the United States Coast Guard Letter of Recommendation and Analysis dated May 10, 2018. This allows for greater navigational efficiency and reliability to enable JCEP to export the full capacity of the optimized design production of 7.8 mtpa from the LNG Terminal. The total volume of capital dredge material from these excavations is approximately 700,000 cubic yards. Dredge material may be distributed between two upland disposal sites, termed APCO[6] site 1 and APCO site 2, or placed entirely at APCO site 2 if shown to be feasible. The dredge areas are named Dredge Area 1 to 4 and located adjacent to the Channel roughly between River Mile ("RM") 2 to RM 7 respectively.

- Enhancement #1 – Coos Bay Inside Range channel and right turn to Coos Bay Range: Excavation at this site will reduce the constriction to vessel passage at the inbound entrance to Coos Bay Inside Range for any ship making the 95 degree turn from the Entrance Range through the Entrance Turn and Range. JCEP proposes to widen the Coos Bay Inside Range channel from the current 300 feet to 450 feet, thereby making it easier for all vessels transiting the area to make this turn. In addition, the total corner cutoff on the Coos Bay Range side will be lengthened from the current 850 feet to about 1,400 feet from the turn's apex.
- Enhancement #2 – Turn from Coos Bay Range to Empire Range channels: The current corner cutoff distance from the apex of this turn is about 500 feet, making it difficult for vessels to begin turning sufficiently early to be able to make the turn and be properly positioned in the center of the next channel range. JCEP

[6] APCO is also referred to as the North Point site. APCO is composed of one island and one section of land in the City of North Bend, just east of the airport.

proposes to widen the turn area from the Coos Bay Range to the Empire Range from the current 400 feet to 600 feet at the apex of the turn and lengthen the total corner cutoff area from the current 1,000 feet to about 3,500 feet.

- Enhancement #3 – Turn from the Empire Range to Lower Jarvis Range channels: JCEP proposes to add a corner cut on the west side in this area that will be about 1,150 feet, thereby providing additional room for vessels to make this turn.
- Enhancement #4 – Turn from Lower Jarvis Range to Jarvis Turn Range channels: JCEP proposes to widen the turn area here from the current 500 feet to 600 feet at the apex of the turn and lengthen to total corner cutoff area of the turn from the current 1,125 feet to about 1,750 feet, thereby allowing vessels to begin their turn in this area earlier.

Maintenance materials will be disposed of in the upland dredge disposal sites located on APCO site 1 and APCO site 2, and management of the dredge areas would be the responsibility of Jordan Cove. APCO site 1 and site 2 are currently not connected, *i.e.*, one is attached to the mainland and the other is an island. As such, JCEP is constructing a temporary bridge to be used to construct a permanent bridge to connect APCO sites 1 and 2. The bridge will facilitate the placement of dredge material disposal. JCEP has requested land use approval from the City of North Bend for construction of the bridge and related components.

Placement of dredge material at the APCO sites would be through one of the following three methods:

- Discharge of a hydraulically dredged slurry from a dredge pipe, pumped directly from the dredge areas;
- Pumped offloading of dredged material from a scow (with the material dredged using either a hydraulic CS dredge or a clamshell); and
- Mechanical offloading of dredged material from a scow (with the material dredged using either a hydraulic CS dredge or a clamshell).

Associated Off-Site Project Components:

Additionally, because the Project will generate construction-related traffic that may have operational impacts on the nearby transportation network, specifically the intersection of U.S. Highway 101 and the TransPacific Parkway ("TPP"), the Oregon Department of Transportation is requiring, that Applicants mitigate such traffic impacts by widening the intersection of U.S. Highway 101 and the TPP to include: an additional 600-foot-long dedicated eastbound turn lane; temporary signalization of the intersection that will be removed following construction of the LNG terminal; and the use of a riprap embankment in unvegetated mudflats on the north side of the TPP/U.S. Highway 101 intersection to facilitate widening of the road for the turn lane (together, the "TPP Improvements").

2.2.1.2 Purpose

The Project is a market-driven response to the burgeoning and abundant natural gas supply in the U.S. Rocky Mountain and western Canada markets, and the growth of international demand, particularly in Asia.

The overall Project purpose and need is to construct a natural gas liquefaction and deep-water export terminal capable of receiving and loading ocean-going LNG carriers, in order to export natural gas derived from a point near the intersections of the GTN Pipeline system and Ruby Pipeline system.

The Pipeline origin near the intersection of the GTN Pipeline system and Ruby Pipeline system is strategically located to give reliable and secure supplies of natural gas from two natural gas supply basins—one in the U.S. Rocky Mountains (through the existing Ruby Pipeline) and a second in western Canada (through the existing GTN Pipeline)—capable of delivering volumes of at least 1.2 million Dth/d in order to support export of 7.8 mtpa of LNG.

The LNG Terminal, proposed to be located on the bay side of the North Spit of Coos Bay, would support receipt, liquefaction, storage, and loading of LNG onto ocean-going LNG carriers for delivery to export markets, giving those supplies an efficient and cost-effective

outlet. The Pipeline is needed to transport natural gas from near the intersection of the GTN Pipeline system and Ruby Pipeline system to the LNG Terminal.

2.2.1.3 Schedule

To meet the projected in-service date in the first half of 2024, construction activities for the Project are expected to begin during the first half of 2020. Construction of the LNG Terminal and marine facilities is expected to take approximately 60 months. Dredging required to create the access channel and for the navigation reliability improvements will occur during the allowable in-water work window (October 1 through February 15).

2.2.2 Consistency with Statewide Planning Goals and Local Land Use Regulations

To establish consistency with the OCMP, JCEP must demonstrate consistency with the enforceable policies implemented through Statewide Planning Goals and local land use regulations. As detailed in Exhibit S, DLCD has identified as enforceable policies the 2013 Statewide Planning Goals and the 2013 (and in some cases, the 2015) editions of applicable local land use regulations, including county and city comprehensive plans and development ordinances.

Under ORS 197.175, the Statewide Planning Goals are to be implemented by local governments through the adoption of comprehensive plans that are consistent with the goals. In turn, the comprehensive plans are to be implemented through adoption and enforcement of land use regulations. Once the local government adopts, and the Oregon Land Conservation and Development Commission ("LCDC") acknowledges, a local government's comprehensive plan and land use regulations implementing that plan, the local government is to make land use decisions consistent with those acknowledged plan and regulations. Therefore, for any project component approved in a local land use decision as compliant under the applicable local comprehensive plan and implementing land use regulations, the project component necessarily is also consistent with Statewide Planning Goals.

The Coos County, City of Coos Bay, and City of North Bend comprehensive plans and land use regulations have been acknowledged by LCDC. Therefore, consistency with the Statewide Planning Goals is necessarily demonstrated by obtaining the required local land use approvals. To the extent that any post-acknowledgement plan amendments are required, consistency with Statewide Planning Goals is independently demonstrated below in Table 1.2.

The LNG Terminal and associated project components are shown in Figure 1.1-1 within JCEP's Application to FERC, *see* Ex. B.1, and discussed *supra* in Section 2.2.1.1. *See also* FERC LNG Terminal Application, Resource Report 1, General Project Description, provided in Ex. B.1. For purposes of land use authorizations, the LNG Terminal includes the following uses, accessory uses, and activities:

- LNG terminal
- Slip and access channel
- Barge berth
- Fire station and training center
- Gas processing area
- Road and utility corridor
- Fill
- Shoreline stabilization (including vegetative, riprap, retaining walls, and bulkheads)
- Dredging
- Dredge material disposal
- Land transportation facility

Other, associated off-site projects, including the Kentuck mitigation site, propose the following uses and activities:

- Mitigation
- Restoration
- Excavation to create new water surface
- Tide-gating
- Fish and wildlife habitat management

The LNG Terminal and associated project components, including the Kentuck mitigation site and TPP Improvements, are located within Coos County. However, three related components are located outside of Coos County: the eelgrass mitigation site (located in the City

of Coos Bay) and the NRIs and dredge material disposal activities at APCO (located in the City of Coos Bay and the City of North Bend).

The LNG Terminal and associated project components will comply with current Statewide Planning Goals and applicable Coos County, City of Coos Bay, and City of North Bend land use regulations. And, as discussed *supra* in Section 1.2.5 and demonstrated *infra* in Tables 1.1, 1.2, and 3, the LNG Terminal and associated project components are likewise consistent with the enforceable policies implemented by the OCMP-approved editions of the Statewide Planning Goals and applicable Coos County, City of Coos Bay, and City of North Bend land use regulations. Pertinent land use approvals and land use approval applications are provided in Exhibits L–O.

2.2.3 Consistency with State Agency Authorities

In addition to demonstrating consistency with the Statewide Planning Goals and applicable local land use regulations, JCEP also must demonstrate consistency with the OCMP enforceable policies implemented through applicable provisions of the ORS and administered by networked state agency authorities.

The LNG Terminal and associated project components comply with the current applicable provisions of the ORS administered by state agency authorities. And, as discussed *supra* in Section 1.2.5 and demonstrated *infra* in Tables 2 and 3, the LNG Terminal and associated project components are likewise consistent with the enforceable policies implemented by the OCMP-approved editions of the applicable provisions of the ORS administered by networked state agency authorities. Pertinent permits, permit applications, and other agency documentation are provided in Exhibits E–K and P–R.

3. PIPELINE CERTIFICATIONS AND NECESSARY DATA AND INFORMATION

3.1 CERTIFICATIONS

3.1.1 Certification to FERC regarding the Pipeline

A copy of PCGP's coastal zone consistency certification to FERC is provided as Exhibit A.

3.1.2 Certification to Corps regarding the Pipeline

A copy of PCGP's coastal zone consistency certification to the Corps is provided as part of the 2017 Corps Application, provided, in relevant part, as Exhibit D.3.

3.2 PIPELINE NECESSARY DATA AND INFORMATION

3.2.1 Project Description

3.2.1.1 Summary of Facilities

PCGP has applied to FERC for authorization under NGA Section 7(c) to construct and operate:

- approximately 229 miles of 36-inch-diameter pipeline;
- two turbine-driven centrifugal compressor units, each providing 31,100 ISO horsepower of compression (for a total installed operating capacity of 62,200 ISO horsepower), and one spare unit of 31,100 ISO horsepower (which is redundant and for reliability purposes only) at the Klamath Compressor Station in Klamath County, Oregon, approximately 1.75 miles northeast of Malin, Oregon;
- natural gas meter stations at three locations: the Jordan Cove Meter Station at MP 1.47R in Coos County, Oregon and the Klamath-Beaver and Klamath-Eagle meter stations, co-located with the compressor station in Klamath County, Oregon;
- new communications towers and equipment buildings;
- mainline block valves at approximately 17 locations along the pipeline; and

- five pig launcher/receiver units.

The 229-mile-long Pipeline would extend from a point of origin near the intersection of the Ruby Pipeline system and GTN Pipeline system, crossing portions of Klamath, Jackson, Douglas, and Coos Counties, Oregon to a western terminus at the Jordan Cove Meter Station on the LNG Terminal site in Coos County, Oregon. The description in this section addresses the entire Pipeline, although most of the Pipeline will be constructed outside of the Oregon Coastal Zone. The extent of the Pipeline within the Coastal Zone is from milepost 0.00 to 53.01. A map of the proposed Pipeline route is shown in Figure 1.1-1 within JCEP's Application to FERC, *see* Ex. B.1.

The federal permits and licenses applicable to the Pipeline outside the Coastal Zone are not listed activities subject to review for consistency under the OCMP, *see* 15 C.F.R. § 930.53(a)(2), and therefore are not addressed in this Application.

3.2.1.2 Purpose

The Pipeline origin near the intersection of the GTN Pipeline system and Ruby Pipeline system is strategically located to give reliable and secure supplies of natural gas from two natural gas supply basins capable of delivering volumes of at least 1.2 million Dth/d in order to support export of 7.8 mtpa of LNG.

3.2.1.3 Schedule

PCGP anticipates starting construction on the Pipeline in the first half of 2020 to allow the new facilities to be placed in service within a timeframe required by contractual commitments. PCGP plans to conduct clearing in some forested areas starting in 2020 prior to mainline construction in 2021. The Pipeline will be installed via trenchless construction techniques (either horizontal directional drills ("HDD") or via a Direct Pipe® installation technology) on five major waterbodies (Coos Bay Estuary, Coos River, South Umpqua River, Rogue River, and Klamath River) to mitigate the impacts to these waterbodies. These crossings

are scheduled to begin in 2020 with the Coos Bay Estuary crossings and continue through 2023 when the Pipeline is scheduled to be completed.

Mainline and facility construction is planned to begin spring 2021 with the in-service date scheduled for fourth quarter 2022. Restoration of construction disturbance in each given area is expected to begin once construction is completed in that area; restoration will be completed by the end of the winter season when forest, wetland, and riparian plantings will be installed. Depending on site-specific conditions, it may be necessary to continue restoration through the spring. Timber clearing in areas of northern spotted owl and marbled murrelet will be conducted outside the critical breeding seasons. Construction activities are scheduled to take advantage of the drier periods of the year to minimize winter construction and to reduce potential environmental impacts and construction safety risks.

PCGP plans to conduct forest clearing starting in the fourth quarter of 2020 prior to mainline construction, to minimize overall work space and temporary extra work area ("TEWA") requirements. TEWA requirements have been minimized by proposing a two-year construction window because the same work areas used to stage right-of-way logging timber clearing activities and provide log storage and decking space would then be utilized for pipeline construction activities. Logging concurrently with pipeline construction would require additional space to work safely and efficiently, and potential clearing delays could force construction activities into the winter rainy season, increasing the potential for erosion and safety hazards. Therefore, scheduling clearing and mainline pipeline construction activities over a two-year period will minimize winter construction requirements resulting from seasonal and biological construction windows.

3.2.2 Consistency with Statewide Planning Goals and Local Land Use Regulations

To establish consistency with the OCMP, PCGP must demonstrate consistency with the enforceable policies implemented through Statewide Planning Goals and local land use regulations. As detailed in Exhibit S, DLCD has identified as enforceable policies the 2013

Statewide Planning Goals and the 2013 (and in some cases, the 2015) editions of applicable local land use regulations, including county and city comprehensive plans and development ordinances.

Under ORS 197.175, the Statewide Planning Goals are to be implemented by local governments through the adoption of comprehensive plans that are consistent with the goals. In turn, the comprehensive plans are to be implemented through adoption and enforcement of land use regulations. Once the local government adopts, and LCDC acknowledges, a local government's comprehensive plan and land use regulations implementing that plan, the local government is to make land use decisions consistent with those acknowledged plan and regulations. Therefore, any project component approved in a local land use decision as compliant under the applicable local comprehensive plan and implementing land use regulations, the project component necessarily is also consistent with Statewide Planning Goals.

The Coos County, Douglas County, and City of North Bend comprehensive plans and land use regulations have been acknowledged by LCDC. Therefore, consistency with the Statewide Planning Goals is necessarily demonstrated by obtaining the required local land use approvals. There is one post-acknowledgment plan amendment required for the Pipeline, which addresses the HDD crossing in Coos County and constitutes a requested amendment to the text of the Coos County Coos Bay Estuary Management Plan ("CBEMP") to allow subsurface low-intensity utilities in the DDNC-DA CBEMP management unit. The consistency of this post-acknowledgement plan amendment with Statewide Planning Goals is independently demonstrated in Table 1.2.

The Pipeline will comply with current Statewide Planning Goals and applicable Coos County, Douglas County, and City of North Bend land use regulations. And, as discussed *supra* in Section 1.2.5 and demonstrated *infra* in Tables 1.1, 1.2, and 3, the Pipeline is likewise consistent with the enforceable policies implemented by the OCMP-approved editions of the Statewide Planning Goals and applicable Coos County, Douglas County, and City of North Bend

land use regulations. Pertinent land use approvals and land use approval applications are provided in Exhibits L–N.

3.2.3 Consistency with State Agency Authorities

In addition to demonstrating consistency with the Statewide Planning Goals and applicable local land use regulations, PCGP also must demonstrate consistency with the OCMP enforceable policies implemented through applicable provisions of the ORS and administered by networked state agency authorities.

The Pipeline will comply with the current applicable provisions of the ORS administered by state agency authorities. And, as discussed *supra* in Section 1.2.5 and demonstrated *infra* in Tables 2 and 3, the portion of the Pipeline within the coastal zone is consistent with the enforceable policies implemented by the OCMP-approved editions of the applicable provisions of the ORS administered by networked state agency authorities. Pertinent permits, permit applications, and other agency documentation are provided in Exhibits E–K and P–R.

Table 1.1: LNG Terminal and Pipeline - Local Land Use Authorizations

Land Use Entitlement	Agency	Authority & Enforceable Policies	Component	Description & Status
LNG Terminal and Associated Facilities ("Omnibus I")	Coos County Planning	Coos County Comprehensive Plan; Coos Bay Estuary Management Plan; Coos County Zoning and Land Development Ordinance	LNG Terminal and associated facilities, including Kentuck and upland mitigation sites	Request for administrative conditional use approval of an LNG Terminal and associated facilities. Approved, then appealed and remanded. Narrative addressing issues on remand submitted. *See* Ex. L.4.
LNG Terminal Components ("Omnibus II")	Coos County Planning	Coos County Comprehensive Plan; Coos Bay Estuary Management Plan; Coos County Zoning and Land Development Ordinance	LNG Terminal associated facilities, including workforce housing, meteorological tower	Request conditional use approval for project components including: workforce housing, meteorological tower, construction laydown, rock apron for pile dike, etc. Application filed. *See* Ex. L.5.
Trans Pacific Parkway/ Highway 101 Intersection ("TPP/101")	Coos County Planning	Statewide Planning Goals; Coos County Comprehensive Plan; Coos Bay Estuary Management Plan; Coos County Zoning and Land Development Ordinance	TPP/101	Request map and text amendment and approval for placement of fill to widen TPP/101 Intersection. Application filed. *See* Ex. L.2.
Navigational Reliability Improvements ("NRIs")	Coos County Planning	Statewide Planning Goals; Coos County Comprehensive Plan; Coos Bay Estuary Management Plan; Coos County Zoning and Land Development Ordinance	NRIs	Request map and text amendment and approval to widen and deepen three corners adjacent to the Channel. Application filed. *See* Ex. L.3.
Navigational Reliability Improvements ("NRIs")	City of Coos Bay, Public Works & Community Development	Statewide Planning Goals; City of Coos Bay Comprehensive Plan; Coos Bay Estuary Management Plan; City of Coos Bay Land Development Ordinance	NRIs	Request map and text amendment and approval to widen and deepen one corner adjacent to the Channel. Application filed. *See* Ex. O.2.
Zoning Verification: Final Order for ZON2007-00034 dated June 15, 2007 (Eelgrass Mitigation)	City of Coos Bay, Public Works & Community Development	Statewide Planning Goals; City of Coos Bay Comprehensive Plan; Coos Bay Estuary Management Plan; City of Coos Bay Land Development Ordinance	Eelgrass Mitigation	Request to establish a 1-2 acre eelgrass bed mitigation site in aquatic unit 52-NA. Approved. *See* Ex. O.1.
Dredge Material Disposal Activities	City of North Bend Planning	Statewide Planning Goals; City of North Bend Comprehensive Plan; Coos Bay Estuary Management Plan; City of North Bend Zoning Ordinance	NRIs/APCO	Disposal of dredge material at APCO, pilings, dredge lines, offloading facilities, bridge. Application filed. *See* Ex. N.2.
Original Pipeline Route (MP 0.00 – 45.70)	Coos County Planning	Coos County Comprehensive Plan; Coos Bay Estuary Management Plan; Coos County Zoning and Land Development Ordinance	Pipeline	Majority of pipeline route in Coos County. Approved and extended. *See* Ex. L.6.
Blue Ridge Pipeline Route (MP 11.1 – 21.8)	Coos County Planning	Coos County Comprehensive Plan; Coos Bay Estuary Management Plan; Coos County Zoning and Land Development Ordinance	Pipeline	Alternative alignment in Coos County. Approved and extended. *See* Ex. L.7.
Brunschmid/Stock Slough Pipeline Route (MP 9.41 – 12.39 & 9.68 – 10.33)	Coos County Planning	Coos County Comprehensive Plan; Coos Bay Estuary Management Plan; Coos County Zoning and Land Development Ordinance	Pipeline	Alternative alignment in Coos County. Approved and extended. *See* Ex. L.8.
HDD/Early Works (MP 0.00 – 0.66 & 1.58 – 7.33)	Coos County Planning	Coos County Comprehensive Plan; Coos Bay Estuary Management Plan; Coos County Zoning and Land Development Ordinance	Pipeline	HDD crossing from Kentuck to APCO and APCO to South Dunes. Includes map and text amendment. Application filed. *See* Ex. L.1.
HDD/Early Works (MP 0.66 – 1.58)	City of North Bend Planning	Statewide Planning Goals; City of North Bend Comprehensive Plan; Coos Bay Estuary Management Plan; City of North Bend Zoning Ordinance	Pipeline	HDD crossing from Kentuck to APCO and APCO to South Dunes. Application filed. *See* Ex. N.1.
Pipeline Route within the Coastal Zone (MP 45.70 – 53.01)	Douglas County Planning	Douglas County Comprehensive Plan; Douglas County Land Use and Development Ordinance	Pipeline	Approximately 7 miles of pipeline in Douglas County. Application filed. *See* Ex. M.1.

Table 1.2: Pipeline and LNG Terminal - Consistency with Land Use Enforceable Policies

Jurisdiction	Authority and Enforceable Policies	Component	Statement of Consistency
Oregon Land Conservation and Development Commission ("LCDC")	<u>Statewide Planning Goals</u> Goal 2 - Land Use Planning Goal 6 - Air, Water and Land Resources Quality Goal 16 - Estuarine Resources Goal 17 - Coastal Shorelands	Trans Pacific Parkway/ Highway 101 Intersection ("TPP/101")	As discussed *supra* in Section 2.2.2, there are four post-acknowledged plan amendments required for the Project: (1) TransPacific Parkway/U.S. Highway 101 intersection improvements; (2) the NRIs in Coos County; (3) the NRIs in the City of Coos Bay; and (4) the HDD Crossing in Coos County for the Pipeline. Because these amendments have not been acknowledged by LCDC, consistency with Statewide Planning Goals is not established necessarily by virtue of the respective land use authorizations. Thus, the amendments and their consistency with Statewide Planning Goals are discussed below. In November 2018, JCEP applied to the Coos County Planning Department requesting authorization to allow public transportation improvements to the intersection of U.S. Highway 101 and TransPacific Parkway as follows: a. A post-acknowledgement amendment of the Coos Bay Estuary Management Plan ("CBEMP") map to change the zoning designation of approximately 1.37 acres of land on the north side of TransPacific Parkway from 10-NA to 11-RS; b. A post-acknowledgement amendment of the CBEMP to take a reasons exception to Statewide Planning Goal 16, to allow the above zone change; c. Amendment to the text of the Coos County Land and Development Ordinance to change the boundary description of the 10-NA and 11-RS estuarine districts to reflect the above zone change; d. Review of a proposal to widen TransPacific Parkway, an existing land transportation facility, in Coos County's 11-RS zone for compliance with general conditions; and e. Approval of an Administrative Conditional Use for the use of fill and riprap in the 11-RS zone to allow widening of TransPacific Parkway, an existing "land transportation facility." These proposed changes' compliance with existing Statewide Planning Goals is detailed in JCEP's Narrative in Support of its Land Use Application for Intersection Improvements, Sec. 2 (Nov. 2, 2018), provided in Ex. L.2. Based on the list of identified enforceable policies provided by DLCD, the OCMP utilizes the current edition of the Statewide Planning Goals. As demonstrated in the Narrative in support of the Land Use Application referenced above, the TPP Improvements will comply with the current edition of the Statewide Planning Goals and, therefore, is necessarily consistent with the OCMP enforceable policies implemented through the Statewide Planning Goals.
		Navigation Reliability Improvements ("NRIs")	On November 21, 2018, JCEP applied with Coos County and, on February 4, 2019 with the City of Coos Bay, for authorization to dredge four submerged areas adjacent to the Coos Bay Deep Draft Navigation Channel to improve navigation efficiency and reliability as follows: <u>Coos County:</u> a. Post-acknowledgment amendments to the CBEMP map at three Coos Bay locations to change the zoning designation at three locations from 59-CA to DDNC-DA; b. A post-acknowledgment amendment of the CBEMP, which is part of the Coos County Comprehensive Plan, to take a reasons exception to Statewide Planning Goal 16 text amendment adopted of the CBEMP in the form of reasons exception to Statewide Planning Goal 16 to authorize the rezone of the NRI Sites to DDNC-DA; c. An amendment of the text of the Coos County Zoning and Land Development Ordinance to clarify that the DDNC-DA designation is appropriate for application to area adjacent to, and not only within, the designated federal navigation channel; and d. Administrative conditional use permit to authorize new and maintenance dredging at the NRI Sites in the DDNC-DA zone. These proposed changes' compliance with existing Statewide Planning Goals is detailed in JCEP's Narrative in Support of its Land Use Application for Intersection Improvements, Sec. 2 (Nov. 2, 2018), provided in Ex. L.3. <u>City of Coos Bay:</u> a. Post-acknowledgement amendments to the CBEMP map to change the zoning designation from 52-NA to DDNC-DA; b. A post-acknowledgment text amendment of the CBEMP, which is part of the City of Coos Bay Comprehensive Plan, to take a reasons exception to Statewide Planning Goal 16 to authorize the rezone of the NRI Site to DDNC-DA; c. Estuarine and Coastal Shoreline Uses and Activities Permit in the DDNC-DA estuarine zone to allow new and maintenance dredging at the rezoned NRI Site; and d. Estuarine and Coastal Shoreline Uses and Activities Permit in the 52-NA, 53-CA, 54-DA, and 55-CA estuarine zones to allow a temporary pipeline to transport the dredge spoils from the NRI Site to approved disposal sites. These proposed changes' compliance with existing Statewide Planning Goals is detailed in JCEP's Narrative in Support of its Land Use Application for Coos Bay Estuary Navigation Reliability Improvements, at 5-42 (Feb. 4, 2019), provided in Ex. O.2. Based on the list of identified enforceable policies provided by DLCD, the OCMP has approved the current edition of the Statewide Planning Goals. *See* Ex. S. As demonstrated in the Narrative in support of the application referenced above, the NRIs will comply with the current edition of the Statewide Planning Goals and, therefore, is necessarily consistent with the OCMP enforceable policies implemented through the Statewide Planning Goals.
		Pipeline	On November 21, 2018, PCGP applied to Coos County requesting approval to construct approximately 3.67 miles of the Pipeline, as part of the Early Works Alignment. *See* Ex. L.1. The application seeks a post-acknowledgement text amendment to allow subsurface low-intensity utilities in the DDNC-DA CBEMP management unit. This proposed change's consistency with existing Statewide Planning Goals is detailed in PCGP's Narrative in Support of the November 21, 2018 application, at 18-73, provided in Ex. L.1. Based on the list of identified enforceable policies provided by DLCD, the OCMP has approved the current edition of the Statewide Planning Goals. *See* Ex. S. As demonstrated in the Narrative in support of the application referenced above, this Pipeline alignment will comply with the current edition of the Statewide Planning Goals and, therefore, is necessarily consistent with the OCMP enforceable policies implemented through the Statewide Planning Goals.
Coos County Planning Department	<u>Coos County Comprehensive Plan ("CCCP")</u> Sec. 5.2, Strategies 2, 14 - Plan policies regarding Land Use & Community Development Sec. 5.3, Strategies 1, 10, 12, 13 - Plan policies regarding Agricultural Lands Sec. 5.4, Strategies 1, 3, 9 - Plan policies regarding Forest Lands Sec. 5.5, Strategies 1, 2, 4 - Plan policies regarding Mineral and Aggregate Resources Sec. 5.6, Strategies 1, 6 - Plan policies regarding Fish and Wildlife Habitats Sec. 5.7, Strategy 3 - Plan policies regarding Historical & Archaeological Resources, Natural Areas, etc. Sec. 5.10, Strategies 1, 2, 3, 5, 7, 8, 9, 10, 11 - Plan policies regarding Dunes, and Ocean and Coastal Lake Shorelands Sec. 5.11 Strategies 1, 4, 6, 7 - Plan policies regarding Natural Hazards Sec. 5.18 Strategies 4, 4a, 5, 6 - Plan policies regarding Public Facilities Sec. 5.22, Strategy 2 - Plan policies regarding Urbanization	LNG Terminal and associated facilities (including Kentuck and upland mitigation sites, workforce housing, and meteorological tower)	JCEP has applied for conditional use approval from Coos County for the LNG Terminal and associated facilities (*see* Omnibus I described in Table 1.1). A Conditional Use Permit previously was approved (the "CUP") on August 30, 2016 (Final Decision and Order No. 16-08-071PL). *See* Ex. L.4. However, the CUP currently is being addressed before Coos County on limited issues that were remanded by the Land Use Board of Appeals ("LUBA").[7] On April 5, 2019, JCEP submitted additional application materials addressing LUBA's limited remand. In addition to conditional use approval for the LNG Terminal and related facilities, the application requested a Floodplain Development Permit for a portion of the Project located in the Industrial zoning district; a Driveway Confirmation Permit for access connections to the Project site; determinations that various permitted uses and activities, including a fire station, processing facility, land transportation facility, utility facility excavation to create new water surface, fill, mitigation, and restoration comply with applicable standards; and time extensions for four conditional use permits previously approved by Coos County, including County File No. ACU-13-22 (upland LNG terminal), County File No. ACU-13-23 (port slip and access waterway), County File Nos. ACU-12-12/ABI-12-02 (fill in 6-WD management unit), and County File Nos. ACU-12-16/ACU-12/17/ACU-12/18 (fill in Industrial zone and 7-D management unit). *See* Ex. L.4, Narrative In Support of the Applications Filed by JCEP (Apr. 5, 2019). Additionally, on April 11, 2019, JCEP applied for approval to construct other facilities related to the LNG Terminal, including but not limited to workforce housing, a meteorological tower, and an industrial wastewater pipeline. *See* "Omnibus II" application at Ex. L.5. JCEP will supplement this CZMA Application with the permit once issued by the County, and Coos County's remand decision on Omnibus I once issued. The LNG Terminal and associated facilities' compliance with the current edition of the CCCP is discussed in detail in the prior CUP and the Omnibus I and II applications. *See* Ex. L.4, Narrative at 5-31, and CUP at 29-189; Ex. L.5. As demonstrated therein, the LNG Terminal and associated facilities will comply with the current edition of the CCCP. The 2013 edition of the CCCP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CCCP since 2013. Thus, the LNG Terminal and associated facilities are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CCCP.
		TPP/101	On November 2, 2018, JCEP applied for approval to complete the required improvements at the intersection of the TPP at U.S. Highway 101, including, as described *supra* in the Statewide Planning Goals discussion, requests to rezone the TPP Improvement site, to amend the CBEMP, to take an exception to Goal 16 to allow the rezoning, and to amend the text of the CCZLDO to change the boundary descriptions of the 10-NA and 11-RS zones. *See* Ex. L.2. The TPP Improvements' consistency with the current edition of the CCCP is described throughout its Narrative in Support of the Nov. 2, 2018 application, at 3-70, provided in Ex. L.2. The 2013 edition of the CCCP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CCCP since 2013. Thus, the TPP Improvements are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CCCP.
		NRIs	On November 21, 2018, JCEP applied for approval to complete NRIs for the Deep Draft Navigation Channel of the Coos Bay Estuary, including certain comprehensive plan, CBEMP map, and CCZLDO amendments, as described *supra* in the Statewide Planning Goals discussion; and to allow new and maintenance dredging in the County's DDNC-DA zone; accessory temporary dredge transport line in the 59-CA, 55A-CA, 2-NA, DDNC-DA, and 3-DA districts; and an accessory buoy in the 5-DA district. The NRIs' consistency with the current CCCP is described throughout its Narrative in Support of the Nov. 21, 2018 application, at 6-45, provided in Ex. L.3. The 2013 edition of the CCCP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CCCP since 2013. Thus, the NRIs in Coos County are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CCCP.
		Pipeline	PCGP has obtained conditional use approval from Coos County for an alignment of the Pipeline that crosses Haynes Inlet ("Original Route") (County File No. HBCU-10-01/REM-11-01), as well as two alternative alignments: Brunschmid/Stock Slough alignment (County File No. HBCU-13-04) and Blue Ridge alignment (County File No. HBCU-13-06). *See* Exs. L.6-8. Additionally, PCGP has requested approval of an alternative alignment of the Pipeline, after determining that realigning the Pipeline to avoid crossing Haynes Inlet and utilizing HDD (as opposed to open cut trenching) as a means for crossing Coos Bay would minimize regulatory impacts than the open trench crossing through Haynes Inlet. *See* Ex. L.1. (Note, the Early Works alignment also crosses the City of North Bend and is discussed further *infra*.) <u>Original Route:</u> In March 2012, PCGP obtained conditional use approval from Coos County for an alignment of the Pipeline that crosses Haynes Inlet, continues through Coos Bay, the Kentuck Slough under the Coos River, and following along an existing powerline. *See* Final Decision and Order on Remand, Coos County Board of Commissioners, No. 12-03-018PL, provided in Ex. L.6. On November 20, 2018, that approval was extended through April 2, 2019. *See* Coos County Final Decision and Order, No. 18-11-073PL, Att. A, at 39-40, provided in Ex. L.6. On March 28, 2019 PCGP applied for another extension, and that request is currently pending with Coos County. The original Pipeline's alignment's compliance with the 2012 through current CCCP is detailed throughout the approvals and extensions from Coos County, provided in Ex. L.6. <u>Brunschmid/Stock Slough Alignment:</u> In February 2014, PCGP obtained conditional use approval for the Brunschmid/Stock Slough alignment, to avoid an approved mitigation site on the north side of the Coos River. *See* Coos County Final Decision and Order, No. 14-01-007PL (Feb. 4, 2014), provided in Ex. L.8. That approval was subsequently extended to February 25, 2019. *See* Final Decision and Order, Coos County Board of Commissioners, No. 18-11-073PL, Att. A, at 40, and provided in Ex. L.8. On February 22, 2019, PCGP applied for another extension, and that request remains pending with Coos County. The Brunschmid/Stock Slough alignment's compliance with the 2014 and subsequent CCCP is detailed throughout the approvals and extensions from Coos County, provided in Ex. L.8. <u>Blue Ridge Alternative Alignment:</u> In October 2014, PCGP obtained an alternative alignment along a ridgeline (aka, "Blue Ridge"). This route was intended to avoid sensitive lowland wetlands areas. Despite these changes, the new segment still crosses the same type of zoning as the original alignment, thus, as Coos County recognized, "the issues are similar to issues that have previously been addressed" in the Brunschmid route. *See* Coos County Final Decision and Order, No. 14-09-062PL, Att. A, Findings of Fact and Conclusions of Law, HBCU 13-06, at 1 (Oct. 21, 2014), provided in Ex. L.7. The Blue Ridge Alignment approval was most recently extended to November 11, 2019. *See* Coos County Planning Department Staff Report Approving Extension of Conditional Use Application Authorization, at 5 (Jan. 24, 2019), provided in Ex. L.7. The Blue Ridge Route's compliance with the 2014 through current CCCP is detailed throughout the approvals and extensions from Coos County, provided in Ex. L.7. [Please note, in the DEIS, a route is referred to as the "Blue Ridge Variation," which is not the same as the Blue Ridge route and is in fact a route that traverses the sensitive lowland areas.] <u>Early Works Alignment:</u> On November 21, 2018, PCGP applied for approval to construct approximately 3.67 miles of the Pipeline within Coos County, as part of the Early Works Alignment. *See* Ex. L.1. This alignment passes through both Coos County and the City of North Bend, from Milepost 0.0, at the meter station at the JCEP campus on the North Spit, traveling south beneath Coos Bay and into the City of North Bend at approximately Milepost 0.66. After that, the Pipeline continues to the east, again beneath Coos Bay, before exiting the City of North Bend and re-entering the unincorporated area of the County at Milepost 1.58. Next, the Pipeline exits the estuary in approximately the Kentuck Slough area. The alignment then generally turns to the southeast along approximately the same route as the PCGP pipeline. This alignment would transverse land in the Industrial, Exclusive Farm Use, and Forest zoning districts and in CBEMP management units 7-D, 7-NA, 13A-NA, DDNC-DA, 45A-CA, 15-NA, 13B-NA, 14-DA, 14-WD, and 15-RS. As discussed *supra* with respect to compliance with Statewide Planning Goals, the permit application seeks text amendment to allow subsurface low-intensity utilities in the DDNC-DA CBEMP management unit; a conditional use permit to authorize the Pipeline in the Forest zoning district; compliance determinations for the Pipeline in the Exclusive Farm Use, Industrial, 7-D, 7-NA, 13A-NA, DDNC-DA, 45A-CA, 15-NA, 13B-NA, 14-DA, 14-WD, and 15-RS, where it is permitted, subject to compliance with conditions; and a Floodplain Development Permit to allow grading and installation of a pipeline in a Special Flood Hazard Area in the balance of the County. This alignment and portion of the Pipeline's compliance with the current CCCP is described throughout the Narrative in Support of the Nov. 21, 2018 application, at 18-73, provided in Ex. L.1. The 2013 edition of the CCCP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CCCP since 2013. Therefore, based on the information in the Narrative supporting the Early Works alignment and post-2013 extensions of the initial pre-2013 Original Route, Brunschmid, and Blue Ridge alignment conditional use approvals, the Pipeline is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CCCP.
	<u>Coos Bay Estuary Management Plan ("CBEMP")</u> Sec. 3.3 Policy 4, including 4a - Resource Capability Consistency and Impact Assessment Sec. 3.3 Policy 5, including 5a-5d - Estuarine Fill and Removal Sec. 3.3 Policy 8 - Estuarine Mitigation Requirements Sec. 3.3 Policy 9 - Solutions to Erosion and Flooding Problems Sec. 3.3 Policy 14 - General Policy on Uses within Rural Coastal Shorelands Sec. 3.3 Policy 16, including 16a and 16b - Protection of Sites Suitable for Water-Dependent Uses and Special Allowance for new Non-Water- Dependent Uses in "Urban Water-Dependent (UW) Units" Sec. 3.3 Policy 18 - Protection of Historical, Cultural and Archaeological Sites Sec. 3.3 Policy 19 - Management of "Wet-Meadow" Wetlands within Coastal Shorelands Sec. 3.3 Policy 20, including 20b and 20c - Dredged Material Disposal Sites Sec. 3.3 Policy 22, including 22b -Mitigation Sites: Protection Against Preemptory Uses Sec. 3.3 Policy 30 - Restricting Actions in Beach and Dune Areas with "Limited Development Suitability" and Special Consideration for Sensitive Beach and Dune Resources Sec. 5 - ALL Management Units	LNG Terminal and associated facilities	The CBEMP is set forth in the CCCP, Volume II, Part I, Sections 3 and 5. As described above with respect to compliance with the applicable provisions of CCCP Sec. 5, the LNG Terminal and associated facilities' compliance with the current edition of the CBEMP is discussed in detail in the prior CUP and the Omnibus I and II applications. *See* Ex. L.4, Narrative at 5-31,CUP at 29-189; Ex. L.5. As demonstrated therein, the LNG Terminal and associated facilities will comply with the current edition of the CBEMP. The 2013 edition of the CBEMP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CBEMP since 2003. Thus, the LNG Terminal and associated facilities are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBEMP.
		TPP/101	The CBEMP is set forth in the CCCP, Volume II, Part I, Sections 3 and 5. As described above with respect to compliance with the applicable provisions of CCCP Sec. 5, the TPP Improvements' consistency with the current CBEMP is described at length in its Narrative in Support of the Nov. 2, 2018 application, at 17–84, provided in Ex. L.2. The 2013 edition of the CBEMP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CBEMP since 2003. Thus, the TPP Improvements are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBEMP.
		NRIs	The CBEMP is set forth in the CCCP, Volume II, Part I, Sections 3 and 5. As described above with respect to compliance with the applicable provisions of CCCP Sec. 5, the NRIs' compliance with the current CBEMP is described at length in its Narrative in Support of the Nov. 21, 2018 application, at 6-45, provided in Ex. L.3. The 2013 edition of the CBEMP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CBEMP since 2003. Thus, the NRIs are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBEMP.
		Pipeline	The CBEMP is set forth in the CCCP, Volume II, Part I, Sections 3 and 5. As described above with respect to compliance with the applicable provisions of CCCP Sec. 5, the Original Route, Brunschmid, and Blue Ridge alignments' compliance with the CBEMP are discussed and demonstrated in the conditional use approvals and extensions provided in Exs. L.6-8. The Early Works alignment's compliance with the current CBEMP is described at length in the Narrative in Support of the Nov. 21, 2018 application, at 18-73, provided in Ex. L.1. The 2013 edition of the CBEMP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CBEMP since 2003. Thus, the Pipeline is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBEMP.

[7] *See Oregon Shores Conservation Coalition v. Coos County*, 76 Or LUBA 346 (LUBA No. 2016-095, November 27, 2017), *aff'd without opinion*, 291 Or App 251 (2018), *rev denied*, 363 Or 481 (2018).

Table 1.2: Pipeline and LNG Terminal - Consistency with Enforceable Policies

Jurisdiction	Authority and Enforceable Policies	Component	Statement of Consistency
	Coos County Zoning and Land Development Ordinance ("CCZLDO") Secs. 2.1.100 – 2.1.200; Definitions (Exception: OCRM does not approve "Continental Shelf") Sec. 4.2.500; Urban Residential Zoning District: Table 4.2.d Sec. 4.2.600; Commercial – Industrial Zoning District: Table 4.2.e Table 4.5.100; Purpose: Land Development Standards Sec. 4.5.175; Site-Specific Zoning Districts Sec. 4.5.180.2; Riparian protection standards re existing structures Sec. 4.5.201; Management Objective DDNC-DA Sec. 4.5.202; Uses, Activities, Special Conditions Table DDNCDA Sec. 4.5.240; Management Objectives for 3-WD Sec. 4.5.241; Uses, Activities, Special Conditions Table 3-WD Sec. 4.5.245; Management Objectives for 3W-NS Sec. 4.5.246; Uses, Activities, Special Conditions Table 3W-NS Sec. 4.5.255; Management Objectives for 4-CS Sec. 4.5.256; Uses, Activities, Special Conditions Table 4-CS Sec. 4.5.260; Management Objectives for 5-WD Sec. 4.5.261; Uses, Activities, Special Conditions Table 5-WD Sec. 4.5.265; Management Objectives for 5A-NS Sec. 4.5.266; Uses, Activities, Special Conditions Table 5A-NS Sec. 4.5.275; Management Objectives for 6-WD Sec. 4.5.276; Uses, Activities, Special Conditions Table 6-WD Sec. 4.5.280; Management Objectives for 6-DA Sec. 4.5.281; Uses, Activities, Special Conditions Table 6-DA Sec. 4.5.285; Management Objectives 7-D Sec. 4.5.286; Uses, Activities, Special Conditions 7-D Sec. 4.5.290; Management Objectives 7-NA Sec. 4.5.291; Uses, Activities, Special Conditions Table 7-NA Sec. 4.5.335; Management Objectives for ; 58-NA Sec. 4.5.336; Uses, Activities, Special Conditions Table ; 58-NA Sec. 4.5.370; Management Objectives for 8-WD Sec. 4.5.371; Uses, Activities, Special Conditions Table 8-WD Sec. 4.5.400; Management Objectives 11-RS Sec. 4.5.401; Uses, Activities, Special Conditions Table 11-RS Sec. 4.5.402; Land Development Standards Table 4.5 Sec. 4.5.425; Management Objectives 13-NA Sec. 4.5.426; Uses, Activities, Special Conditions Table 13-NA Sec. 4.5.440; Management Objectives 14-WD Sec. 4.5.441; Uses, Activities, Special Conditions Table 14-WD Sec. 4.5.445; Management Objectives 14-DA Sec. 4.5.446; Uses, Activities, Special Conditions Table 14-DA Sec. 4.5.450; Management Objectives 15-RS Sec. 4.5.451; Uses, Activities, Special Conditions Table 15-RS Sec. 4.5.455; Management Objectives 15-NA Sec. 4.5.456; Uses, Activities, Special Conditions Table 15-NA Sec. 4.5.525; Management Objectives 45A-CA Sec. 4.5.526; Uses, Activities, Special Conditions Table 45A-CA Sec. 4.6.230; Procedural Requirements for Development within Special Flood Hazard Areas Table 4.7a; Special Regulatory Considerations Prescribed By The Coos County Comprehensive Plan Sec. 4.8.200; Uses Permitted Sec. 4.8.600; Mandatory Siting Standards Required for Dwellings and Structures in the Forest Zone Sec. 4.8.700; Fire Siting and Safety Standards Sec. 4.9.200; Uses Permitted Outright Sec. 4.9.300; Administrative Conditional Use Sec. 4.9.400; Review Criteria for Conditional Use	LNG Terminal and associated project components	As described above with respect to compliance with the applicable provisions of CCCP Sec. 5, the LNG Terminal and associated facilities' compliance with the current edition of the CCZLDO, too, is discussed in detail in the prior CUP and the Omnibus I and II applications. *See* Ex. L.4, Narrative at 5-31, CUP at 29-189; Ex. L.5. As demonstrated therein, the LNG Terminal and associated facilities will comply with the current edition of the CCZLDO. The 2013 edition of the CCZLDO is approved in the OCMP. As detailed in Table 3, there do not appear to have been any substantive changes to the applicable provisions of the CCZDLO since 2013. Thus, the LNG Terminal and associated facilities are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CCZLDO.
		TPP/101	As described above with respect to compliance with the applicable provisions of CCCP Sec. 5, the TPP Improvements' consistency with the current CCZLDO, too, is described throughout the Narrative in Support of the Nov. 2, 2018 application, at 17–84, provided in Ex. L.2. The 2013 edition of the CCZLDO is approved in the OCMP. As outlined detailed in Table 3, there do not appear to have been any substantive changes to the applicable provisions of the CCZDLO since 2013. Thus, the TPP Improvements are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CCZLDO.
		NRIs	As described above with respect to compliance with the applicable provisions of CCCP Sec. 5, the NRIs' consistency with the current CCZLDO, too, is described throughout the Narrative in Support of the Nov. 21, 2018 application, at 6-45, provided in Ex. L.3. The 2013 edition of the CCZLDO is approved in the OCMP. As outlined detailed in Table 3, there do not appear to have been any substantive changes to the applicable provisions of the CCZDLO since 2013. Thus, the NRIs are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CCZLDO.
		Pipeline	As described above with respect to compliance with the applicable provisions of CCCP Sec. 5, the Original Route, Brunschmid, and Blue Ridge alignments' compliance with the CCZLDO are discussed and demonstrated in the conditional use approvals and extensions provided in Exs. L.6-8. The Early Works alignment's compliance with the current CBEMP is described at length in the Narrative in Support of the Nov. 21, 2018 application, at 18-73, provided in Ex. L.1. The 2013 edition of the CCZLDO is approved in the OCMP. As outlined detailed in Table 3, there do not appear to have been any substantive changes to the applicable provisions of the CCZDLO since 2013. Thus, the Pipeline is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CCZLDO.
City of Coos Bay, Public Works & Community Development Department * Note, DLCD has not supplied Applicants with a list of applicable enforceable policies implemented for the City of North Bend. As such, Applicants have identified the above provisions as applicable to the components to be located in the City of North Bend based on the pertinent land	City of Coos Bay Comprehensive Plan ("CBCP") Section 7.10, ER.1 Estuarine Resources (adoption of CBEMP provisions)	NRIs	As discussed above with respect to Statewide Planning Goals, JCEP has applied for approval to authorize the NRIs on approximately 3.3 acres in the 52-NA zone. On February 4, 2019, JCEP submitted to the Lane Council of Governments[8] additional information requested to support the approval. *See* Ex. O.2. This specific NRI location is currently zoned 52-NA under the CBEMP and is proposed for rezoning to the DDNC-DA designation. The NRIs are location-specific and it would not be possible for JCEP to locate them anywhere that does not require a new exception. In addition, JCEP is requesting an Estuarine and Coastal Shoreline Uses and Activities Permit to allow the proposed new dredging. *See* Narrative at 2, Ex. O.2. The NRIs' compliance with the current version of the CBCP is detailed in the Narrative in Support of its Application before the City of Coos Bay Planning Commission, at 5-43, provided in Ex. O.2. The 2013 edition of the CBCP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CBCP since 2013. Thus, the NRIs are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBCP.
		Eelgrass mitigation	On June 15, 2007, JCEP received approval to establish a 1-2 acre eelgrass bed mitigation site, an allowed use, in aquatic unit 52-NA within the City of Coos Bay. The eelgrass mitigation project's compliance with the 2007 edition of the CBCP is demonstrated by the City of Coos Bay Zoning Verification, Final Order for ZON2007-00034 dated June 15, 2007, provided as Ex. O.1. The 2013 edition of the CBCP is approved in the OCMP. DLCD has not provided, and JCEP was unable to obtain, a copy of the 2007 edition of the CBCP to confirm any changes. However, because the only provision of the CBCP identified by DLCD as an enforceable policy is Sec. 7.10, adopting the provisions of the CBEMP, here, compliance with the CBEMP necessarily demonstrates compliance with Sec. 7.10 of the CBCP. The eelgrass mitigation site's compliance with the CBEMP is discussed below.
	CBEMP within City of Coos Bay limits Lower Bay/Upper Bay DA All requirements, Aquatic Unit/Deep-Draft Navigation Channel	NRIs	As discussed above with respect to compliance with the CBCP, the NRIs' compliance with the current version of the CBEMP, too, is detailed in the Narrative in Support of the Application before the City of Coos Bay Planning Commission, at 5-43, provided in Ex. O.2. The 2013 edition of the CBEMP, as adopted in the CBCP, is approved in the OCMP. As outlined in Table 3, there have been no changes to the CBEMP since 2013. Thus, the NRIs are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBEMP.
		Eelgrass mitigation	As discussed above with respect to compliance with the CBCP, the eelgrass mitigation project's compliance with the 2007 version of the CBEMP is demonstrated by the City of Coos Bay Zoning Verification, Final Order for ZON2007-00034 dated June 15, 2007, provided as Ex. O.1. The 2013 edition of the CBEMP, as adopted in the CBCP, is approved in the OCMP. As outlined in Table 3, there have been no changes to the CBEMP since 2003. Therefore, compliance with the CBEMP in 2007 necessarily demonstrates compliance with the 2013 edition of the CBEMP. Therefore, the eelgrass mitigation is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBEMP.
	City of Coos Bay Land Development Ordinance ("CCBLDO") Chapter 17.340, 17.340.010 – 17.340.080 Estuarine and Coastal Shorelands Uses and Activity	NRIs	As discussed above with respect to compliance with the CBCP, the NRIs' compliance with the current version of the CCBLDO, too, is detailed in the Narrative in Support of the Application before the City of Coos Bay Planning Commission, at 5-43, provided in Ex. O.2. The 2013 edition of the CCBLDO is approved in the OCMP. As outlined in Table 3, with the exception of a few minor procedural changes not relevant here, there have been no substantive changes to the applicable provisions of the CCBLDO since 2013. Therefore, the NRIs are and will be conducted in a matter consistent with the OCMP enforceable policies implemented through the CCBLDO.
		Eelgrass mitigation	As discussed above with respect to compliance with the CBCP, the eelgrass mitigation project's compliance with the 2007 version of the CCBLDO, too, is demonstrated by the City of Coos Bay Zoning Verification, Final Order for ZON2007-00034 dated June 15, 2007, provided as Ex. O.1. Similar to the discussion above with respect to the CBCP, the portion of the CCBLDO DLCD has identified as an applicable enforceable policy, CCBLDO Ch. 17.340, incorporates and utilizes the requirements of the CBEMP. Therefore, here too, compliance with the 2007 CBEMP necessarily demonstrates compliance with the 2013 edition of CCBLDO Ch. 17.340. The eelgrass mitigation site's compliance with the CBEMP is discussed above. Thus, the eelgrass mitigation is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBEMP.
City of North Bend Planning Department	City of North Bend Comprehensive Plan ("CNBCP") Chapter XII, Coastal, Article 12.5.100.1 Chapter XIII, Land Use, Article 13.7.100	Pipeline	On December 27, 2018, PCGP applied for approval to develop an approximately 0.92-mile Early Works alignment of the Pipeline within the City of North Bend on land in the M-H zoning district and in CBEMP management units 48-CA, 48-CS, 47-UW, and 47-DA. The application also seeks an Estuary Permit to authorize the use in the four CBEMP management units and an application for a Floodplain Development Permit to authorize the use in certain portions of the M-H zoning district. *See* Ex. N.1. Compliance with the current edition of the CNBCP is detailed in the Narrative in Support of the Dec. 27, 2018 application, at 15-25, provided in Ex. N.1. The 2013 edition of the CNBCP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CNBCP since 2013. Thus, the Early Works Pipeline alignment is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CNBCP.
		Dredge Disposal Activities at APCO Site	On April 8, 2019, JCEP submitted an application for approval of an Estuarine Permit and a Floodplain Development Permit to authorize uses and activities related to dredge material disposal at APCO. APCO is primarily zoned Heavy Industrial and the placement of the dredge material will include ancillary activities (e.g., placement of dredge material at APCO, pilings, dredge lines, offloading equipment and the construction of a temporary work bridge and a permanent bridge), all of which are anticipated to be allowed uses under the City's land use regulations. *See* Ex. N.2. Compliance with the current edition of the CNBCP is detailed in the Narrative in Support of the Apr. 8, 2019 application, at 4-46, provided in Ex. N.2. The 2013 edition of the CNBCP is approved in the OCMP. As outlined in Table 3, there have been no changes to the CNBCP since 2013. Thus, the dredge disposal activities at APCO are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CNBCP.
	CBEMP within City of North Bend limits 47-UW All requirements, Urban Waterfront 48-CA All requirements, Conservation Aquatic 48A-CA All requirements, Conservation Aquatic 48-CS All requirements, Conservation Shoreland 50-NA All requirements, Natural Aquatic	NRIs	As discussed above with respect to compliance with the CNBCP, the NRIs' compliance with the current version of the CBEMP, too, is detailed in the Narrative in Support of the Dec. 27, 2018 application, at 15-25, provided as Ex. N.1. The 2013 edition of the CBEMP, as adopted in the CNBZO, is approved in the OCMP. As outlined in Table 3, there have been no changes to the CBEMP since 2013. Thus, the NRIs are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBEMP.
		Dredge Disposal Activities at APCO Site	As discussed above with respect to compliance with the CNBCP, the APCO Dredge disposal activities' compliance with the current version of the CBEMP, too, is detailed in the Narrative in Support of the Apr. 8, 2019 application, at 4-46, provided in Ex. N.2. The 2013 edition of the CBEMP, as adopted in the CNBZO, is approved in the OCMP. As outlined in Table 3, there have been no changes to the CBEMP since 2013. Thus, the APCO Dredge

[8] The City of Coos Bay Planning Staff has engaged the Lane Council of Governments as a consultant to provide planning services and support on JCEP's NRI application.

Jurisdiction	Authority and Enforceable Policies	Component	Statement of Consistency
use applications. Should DLCD wish to identify these applicable enforceable policies in the future, Applicants will amend and supplement this Application to demonstrate compliance with those enforceable policies.	51-CA All requirements, Conservation Aquatic 52-NA All requirements, Natural Aquatic		disposal activities are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CBEMP.
	City of North Bend Zoning Ordinance ("CNBZO") Section 3, Definitions Section 5, Classification of Zones Section 6, Zoning Map Sections 53 - 58, Light Industrial District M-L Sections 59 - 61, Heavy Industrial District M-H Sections 64 - 69, Floodplain Zone F-P	NRIs	As discussed above with respect to compliance with the CNBCP, the NRIs' compliance with the current version of the CNBZO, too, is detailed in the Narrative in Support of the Dec. 27, 2018 application, at 15-25, provided in Ex. N.1. The 2013 edition of the CNBZO is approved in the OCMP. As outlined in Table 3, the only substantive change identified in the CNBZO since 2013 was the addition of temporary workforce housing as an allowed conditional use in the heavy industrial zone. With the exception of minor amendments to unrelated provisions and recodification within the North Bend Municipal Code, there have been no other changes to the CNBZO since 2013. Thus, the NRIs are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CNBZO.
		Dredge Disposal Activities at APCO Site	As discussed above with respect to compliance with the CNBCP, the APCO Dredge disposal activities' compliance with the current version of the CNBZO, too, is detailed in the Narrative in Support of the Apr. 8, 2019 application, at 4-46, provided in Ex. N.2. The 2013 edition of the CNBZO is approved in the OCMP. As outlined in Table 3, the only substantive change identified in the CNBZO since 2013 was the addition of temporary workforce housing as n allowed conditional use in the heavy industrial zone. With the exception of minor amendments to unrelated provisions and recodification within the North Bend Municipal Code, there have been no other changes to the CNBZO since 2013. Thus, the APCO Dredge disposal activities are and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the CNBZO.
Douglas County Planning Department	Douglas County Comprehensive Plan ("DCCP") Rural Land Use Policies; Rural Resource Designations; Criteria for designating rural resource lands Rural Land Use Policies; Overlay Zones; Table specifies overlay zone designations and relationship to plan policies for twenty overlay zones	Pipeline	On April 5, 2019, PCGP submitted an application for approval to develop an approximately 7.5-mile alignment of the Pipeline within the coastal zone in Douglas County, on land in the Exclusive Farm Use-Grazing (FG), Timberland Resource (TR), and Farm Forest (FF) zones. The Pipeline qualifies as a utility facility necessary for public service and is allowed outright in the FG zone and is allowed as a conditional use within the TR and FF zones as a new distribution line with rights-of-way 50 feet or less in width. *See* Ex. M.1. Compliance with the DCCP is detailed throughout the Narrative in Support of the Apr. 5, 2019 application, at 6-30, provided in Ex. M.1. The 2015 edition of the DCCP is approved in the OCMP. As outlined in Table 3, with the exception of a comprehensive restructuring, there do not appear to have been any substantive changes made to the specific DCCP provisions applicable to the Pipeline since 2015. Thus, the Pipeline in Douglas County is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the DCCP.
	Douglas County Land Use and Development Ordinance ("DCLUDO") Chapter 1: Intro and General Provisions; Sections 1.010-1.090; Purpose, scope, compliance, definitions Chapter 3: Zoning; Article 3.1; Introductory Provisions Chapter 3: Zoning; Article 3.2; Timberland Resources (TR) Chapter 3: Zoning; Article 3.3; Exclusive Farm Use-Grazing (FG) Chapter 3: Zoning; Article 3.5; Farm Forest (FF) Chapter 3: Zoning; Article 3.6 (Except 3.36.000-3.36.040) Agriculture and Woodlot (AW) Chapter 3: Zoning; Article 3.32; Supplementary Provisions for Natural Resource Areas Chapter 3: Zoning; Article 3.39; Conditional use review	Pipeline	The Pipeline's compliance with the specific applicable provisions of the DCLUDO is detailed throughout the Narrative in Support of the Apr. 5, 2019 application, at 6-30, provided in Ex. M.1. The 2014 edition of the DCLUDO,is approved in the OCMP. As outlined in Table 3, with the exception of procedural changes surrounding LUBA remands and boundary line adjustment restrictions per measure 49 waivers, no substantive changes have been made to the DCLUDO since 2014. Thus, the Pipeline in Douglas County is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through the DCLUDO.

Table 2: Pipeline and LNG Terminal - Consistency with State Agency Enforceable Policies

Enforceable Policy (ORS §)	State Authorization	Networked Agency	Component	Authorization Status & Statement of Consistency
196.682 Permits required for removal or fill; conditions on issuance of permit 196.687 Regulation of alteration or fill of artificially created wetlands 196.800 Definitions 196.805 Policy 196.815 Application for permit; rules; fees; disposition of fees 196.818 Wetland delineation reports; review by Department of State Lands; fees; rules 196.825 Criteria for issuance of permit; conditions; consultation with public bodies; hearing; appeal 196.830 Estuarine resource replacement as condition for fill or removal from estuary; considerations; other permit conditions 196.845 Investigations and surveys 196.825 Criteria for issuance of permit; conditions consultation with public bodies; hearing; appeal 196.855 Noncomplying removal of material or filling as public nuisance 196.880 Fill under permit presumed not to affect public rights; public rights extinguished 196.905 Applicability; rules	Removal-Fill permit	Oregon Department of State Lands ("DSL")	LNG Terminal and Pipeline in Coastal Zone	JCEP filed a removal-fill application in November 2017 for all components of the LNG Terminal (including the slip and access channel) and Pipeline. DSL reviewed and provided an incompleteness response. JCEP filed a revised application on November 7, 2018. DSL then went out on public notice and comment which ended on February 3, 2019. DSL is currently reviewing comments received during the public comment period. Detailed information about removal-fill and marine facility-construction activities associated with the LNG Terminal is provided in the Removal-Fill Application, Part 1, Att. E, the Dredge Material Management Plan, provided in Ex. E.1 to this Application. Additional marine facility construction activities are described in the Removal-Fill Application, Part 1, Atts. A.1 and D, provided in Ex. E.1 to this Application. The specific measures that Applicants have taken or will take to meet the applicable requirements of the removal-fill laws and regulations, including avoiding and minimizing fill and removal in waters of the state and providing compensatory mitigation with respect to the LNG Terminal and associated facilities, are detailed in the Removal-Fill Permit Application Part I and its attachments, including but not limited to the Project Description, Att. A.1; the Compensatory Wetland Mitigation Plan, Att. I; and the Wetland Impacts Avoidance and Minimization Technical Memorandum, Att. B.2; all provided in Ex. E.1 to this Application. Detailed information about removal-fill and impact mitigation with respect to the Pipeline within the coastal zone is available in Part 2 of the Removal-Fill Application, including specifically, Atts. A, B, and C, all of which are provided in Ex. E.2. These documents demonstrate that the Project complies with the current edition of ORS Ch. 196. The 2013 edition of ORS Ch. 196 is approved in the OCMP. With the exception of a few unrelated amendments, detailed in Table 3, the applicable provisions of ORS Ch. 196 have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Ch. 196.
274.005 Definitions 274.025 Jurisdiction over submersible and submerged lands generally 274.040 Sale or lease of submersible lands; easements; occupation of submerged and submersible lands for water works 274.043 Exemptions from leasing requirements; rules; registration; use without charge; use with charge; indemnification 274.060 Regulation of harbor improvements; oyster beds; public easement in submerged and submersible lands 274.400 Beds of Streams, Lakes, Bays; Definition for ORS 274.400 to 274.412 274.402 Exclusive jurisdiction to assert title to submerged or submersible lands in navigable waterway 274.550 Removal of material without payment of royalties; eligible material and uses 274.705 Tidal Submersible and Submerged; Definitions for ORS 274.705 to 274.860 274.710 Jurisdiction of department over tidal submerged lands; easements; leases for oil, gas and sulfur 274.860 Protection and location of filled lands 274.905 Submersible, submerged and new lands; Definitions for ORS 274.905 to 274.940 274.920 Creation of new lands upon submersible or submerged lands 274.940 Reservation of historically filled lands or new lands	Leasing Tidal Submerged and Submersible Lands	Oregon Department of State Lands ("DSL")	LNG Terminal in Coastal Zone	To obtain the State of Oregon's authorization to use the beds of State-owned waterbodies, Applicants have consulted with DSL to determine the required proprietary waterway authorizations. Since February 2015, Applicants have had regular correspondence with Gerry Hutson, Proprietary Coordinator – Aquatic Resource Management for DSL. DSL provided Applicants with a draft work scope of proprietary authorizations pertaining to the current Project as early as April 12, 2017. Applicants and DSL have had ongoing meetings, including most recently, when JCEP met with Ms. Hutson at DSL's Salem offices in November 2018, and have been engaged in regular email and phone correspondence both before and since that time. Both JCEP and PCGP are currently working with Ms. Hutson to finalize the list of authorizations needed. The following are expected proprietary authorizations needed within the coastal zone, though the list is still in the process of being confirmed: **<u>Pipeline</u>** **Easements on Non-Trust Lands:** • Stock Slough (APP 56483) – new location, legal needs revision • Vogel Creek (APP 56492) – new location, legal needs revision • Coos River (APP 56495) – same location • Kentuck Slough (APP 56494) – new location, legal needs revision • HDD Crossing from South Dunes site to APCO – new application • HDD Crossing from North Bend to Kentuck Slough – new application **<u>LNG Terminal and Associated Components</u>** **Easements on Non-Trust Lands:** • Scour Apron and Access Channel – may need easement for riprap support • Pile Dike Rock Apron west of Access Channel – may need easement or 5-year registration • Stormwater Outflows to Coos Bay – Required if outflows are located on State-owned lands. JCEP confirming whether any exist. • Stormwater Outflows to Kentuck Slough – On waterside of East Bay Dr. into Coos Bay. JCEP confirming if needed. • Bridge easement for APCO – A permanent bridge will cross over the State-owned tidal channel. • Dredge disposal pipeline – Temporary easement for the pipeline along the bay to carry the dredge material from the channel widening of the four corners to the APCO disposal site. • Temporary fill for the slip construction and Material Off Loading site extending into State-owned waters **Leasing and Registration on State-Owned Submerged and Submersible Lands:** • One Data Buoy for the Access Channel – registration is required and can be renewed every 5 years. **Special Uses on State-Owned Land:** • Short Term Access Agreement for temporary barge for dredge material offloading at Kentuck Slough mitigation site • Short Term Access Agreement for temporary construction of a steel cradle over eelgrass to assist in dredge disposal at APCO **State-Owned Submerged and Submersible Lands Subject to Remediation and Habitat Restoration Activities:** • Eelgrass Conservation Easement • Kentuck Slough Mitigation Project Conservation Easement • Kentuck Slough Access Agreement **Sand and Gravel Licenses:** • Scour Apron and Access Channel • Ingram Yard Facility Siting and the Marine Slip • Navigational Reliability Improvements This ongoing consultation with DSL supports that the Project will comply with the current edition of ORS Ch. 274. Consistency will be demonstrated in full once the proprietary authorization applications are submitted and authorizations are issued. The 2013 edition of ORS Ch. 274 is approved in the OCMP. With the exception of a few unrelated amendments, detailed in Table 3, the applicable provisions of ORS Ch. 274 have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Ch. 274.
390.010 Policy of state toward outdoor recreation resources 390.235 Permits and conditions for excavation or removal of archaeological or historical material; rules; criminal penalty 390.237 Removal without permit; exceptions	Archeological Permits	Oregon State Historic Preservation Office ("SHPO")	LNG Terminal and Pipeline in Coastal Zone	Applicants have, since 2013, applied for and received over 20 SHPO permits authorizing necessary investigations, surveys, and testing activities associated with the LNG Terminal and Pipeline. A complete list of permits obtained is provided in Exhibit R. Additionally, Applicants continue to submit SHPO permit applications associated with ongoing work. As further evidence of compliance with this enforceable policy, Applicants have executed a Cultural Resources Protection Agreement ("CRPA") with the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians. Ex. R.3. Attached to the CRPA as Exhibit B is an Unanticipated Discovery Plan ("UDP"). The UDP details the process that will be followed in the event of an unanticipated discovery for human remains and archeological objects. The CRPA and UDP collectively provide additional assurance that Applicants will comply with the provisions of ORS Ch. 390. Applicants have not and will not excavate or alter any archaeological sites on public lands; make an exploratory excavation on public lands to determine the presence of an archaeological site; remove from public lands any material of an archaeological, historical, prehistorical, or anthropological nature; or excavate or remove any archaeological, historical, prehistorical, or anthropological materials from the land without first obtaining the necessary permit from SHPO. As such, the Project has complied and will continue to comply with the current edition of the applicable provisions of ORS Ch. 390 throughout the construction process. The 2013 edition of ORS Ch. 390 is approved in the OCMP. With the exception of one unrelated amendment, detailed in Table 3, the applicable provisions of ORS Ch. 390 have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Ch. 390.
454.605 Definitions for ORS 454.605 to 454.755 454.607 Policy 454.610 Regulation of gray water discharge; permit; rules 454.655 Permit required for construction; application; time limit; special application procedure for septic tank installation on parcel of 10 acres or more 454.657 Variance from subsurface sewage disposal system rules or standards; conditions; hearing	NPDES Wastewater Discharge Permit	Oregon Department of Environmental Quality	LNG Terminal	Neither gray water discharge nor septic system is proposed in association with the Project. Thus, neither ORS 454.610 nor ORS 454.655 applies. As documented in JCEP's January 31, 2019 NPDES Permit modification application, two sanitary package plant wastewater treatment facilities are to be constructed to treat wastewater generated by construction offices, construction workforce housing, and washcar facilities (portable worker sanitation/washing facilities). *See* Ex. J.2, NPDES Form 2D; NPDES Permit Modification Report at 5, 10. Wastewater treatment solids will be appropriately disposed of at an offsite disposal facility. No wastewater will be disposed of onsite. NPDES Permit Modification Report at 6, 10. The sewage system will be constructed and operated in compliance with all applicable requirements. As such, and as discussed further in Exhibit J.2, the Project will comply with the current edition of ORS Ch. 454. The 2013 edition of ORS Ch. 454 is approved in the OCMP. As documented in Table 3, the applicable provisions of ORS Ch. 454 have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Ch. 454.
468A.005 Definitions for air pollution laws 468A.010 Policy 468A.020 Application of air pollution laws	Type B State NSR application for a Standard Air	Oregon Department of Environmental	LNG Terminal	The LNG Terminal was previously permitted as a Prevention of Significant Deterioration ("PSD") source under ACDP No. 06-0118-ST-01 in 2015. However, after the terminal design changed, omitting plans for a 420 MW on-site power generation facility, in September 2017, JCEP applied to DEQ for a New Source

Enforceable Policy (ORS §)	State Authorization	Networked Agency	Component	Authorization Status & Statement of Consistency
468A.025 Air purity standards; air quality standards; treatment and control of emissions; rules 468A.040 Permits; rules 468A.045 Activities prohibited without permit; limit on activities with permit 468A.050 Classification of air contamination sources; registration and reporting of sources; rules; fees 468A.055 Notice prior to construction of new sources; order authorizing or prohibiting construction; effect of no order; appeal 468A.060 Duty to comply with laws, rules and standards 468A.070 Measurement and testing of contamination sources; rules 468A.075 Variances from air contamination rules and standards; delegation to local governments; notices	Contaminant Discharge Permit ("ACDP")	Quality ("DEQ")		Review application for an air contaminant discharge permit ("ACDP") for the Project. *See* Ex. H, JCEP ACDP Application, Sept. 2017. Within 12 months after LNG Terminal operations begin, JCEP will apply to DEQ for a renewable federal Clean Air Act Title V permit to authorize air emissions during the operating life of the LNG Terminal. *See* Ex. H, ACDP Application at 20. The LNG Terminal site, in Coos County, Oregon, is in attainment or unclassified for all pollutants. Air quality in the vicinity of the LNG Terminal meets all ambient air quality criteria and will continue to meet these criteria during the construction and operation of the LNG Terminal. The ACDP will ensure that the LNG Terminal meets these criteria and complies with all applicable federal and state air emissions regulations. As such, and as discussed at length in the ACDP Application, the Project will comply with the current edition of ORS Ch. 468A. The 2013 edition of ORS Ch. 468A is approved in the OCMP. With the exception of a few unrelated amendments, detailed in Table 3, the applicable provisions of ORS Ch. 468A have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Ch. 468A.
468B.005 Definitions for water pollution control laws 468B.015 Policy 468B.020 Prevention of pollution 468B.025 Prohibited activities 468B.048 Rules for standards of quality and purity; factors to be considered; meeting standards 468B.050 Water quality permit; issuance by rule or order; rules 468B.052 Fees for water quality permit to operate suction dredge 468B.055 Plans and specifications for disposal, treatment and sewerage systems 468B.060 Liability for damage to fish or wildlife or habitat; agency to which damages payable 468B.075 Definitions for 468B.080 468B.080 Prohibitions relating to garbage or sewage dumping into waters of state 468B.085 Depositing vehicles or manufactured structures into water prohibited 468B.120 Definitions for 468B.120 to 468B.135 468B.125 Policy to reduce phosphorous pollution 468B.130 Prohibition on sale or distribution of cleaning agents containing phosphorous; rules 468B.135 Exemptions 468B.150 Definitions for 468B.150 to 468B.190 468B.155 State goal to prevent ground water contamination 468B.160 Ground water management and use policy 468B.300 Definitions for 468B.300 to 468B.500 468B.305 Entry of oil into waters of state prohibited; exceptions 468B.310 Liability for violation of 468B.305; exceptions 468B.315 Duty to collect and remove oil; dispersal of oil 468B.320 Action by state; liability for state expense; order; appeal 468B.337 Liquefied natural gas 468B.345 Oil spill contingency plan required to operate facility or covered vessel in state or state waters; exceptions 468B.350 Standards for contingency plans; oil spill response zones; rules 468B.355 Contingency plans; participation in maritime association; lien; liability of maritime association; exemption from liability 468B.360 Review of contingency plan 468B.365 Plan approval; change affecting plan; certificate of approval 468B.370 Determination of adequacy of plan; practice drills; rules 468B.375 Inspection of facilities and vessels; coordination with State of Washington 468B.380 Tank vessel inspection program; rules 468B.385 Modification of approval of contingency plan; revocation of approval; violation 468B.390 Compliance with federal Oil Pollution Act of 1990; proof of financial responsibility 468B.450 Willful or negligent discharge of oil; civil penalty; authority of director to mitigate 468B.460 Rules 468B.475 Legislative finding; need for evidence of financial assurance for ships transporting oil 468B.485 Methods of establishing financial assurance	401 Water Quality Certification; NPDES Wastewater Discharge Permit (LNG Terminal only); NPDES 1200-C Construction Stormwater Permit	Oregon Department of Environmental Quality ("DEQ")	LNG Terminal and Pipeline within Coastal Zone	DEQ implements ORS Ch. 468B through, as relevant here, its Clean Water Act Section 401 Certification and NPDES Industrial Wastewater and Stormwater permitting programs. Accordingly, the Project's consistency with the enforceable policies represented throughout ORS Ch. 468B is supported by the following permits and permit applications and in the FERC Application, Resource Report 2, Water Use and Quality, provided in Ex. B. **Section 401 Certification**: On October 23, 2017, Applicants submitted an application under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act ("Section 404/10 Application") to the U.S. Army Corps of Engineers. Concurrently, Applicants provided the Section 404/10 Application to DEQ to commence its review under Section 401 of the Clean Water Act with respect to Section 401 certification. DEQ is currently reviewing the application. The Project's compliance with Section 401 of the Clean Water Act is detailed in the Section 404/10 Application, provided in Ex. D, and the subsequent supplementary 401 Certification Application submittals, provided in Ex. G, including specifically, the Technical Memorandum from DEA, at 3-31 (Apr. 15, 2018). **NPDES Industrial Wastewater**: JCEP has an NPDES Wastewater Discharge Permit for current site conditions at the future LNG Terminal location, which allows discharge of treatment of leachate from an existing landfill through an ocean outfall line. *See* Ex. J.1, NPDES Permit No. 101499. On January 31, 2019, JCEP submitted an NPDES Permit Modification Application to reflect proposed changes to waste streams in the LNG Terminal wastewater discharges. As discussed in detail in the NPDES Permit Modification Application Report, operational wastewater discharges at the LNG Terminal will be treated through permanent treatment facilities associated with the site. *See* Ex. J.2, NPDES Permit Modification Application Report, at 7-9, Fig. 3. JCEP will comply with the conditions of the permit, which will ensure compliance with all applicable instream water quality standards and other applicable federal and state requirements. Other aspects of the LNG Terminal's compliance with the enforceable policies implemented through the NPDES industrial wastewater permitting program, including contact stormwater treatment systems, are detailed in the LNG Terminal NPDES Permit Modification Application, specifically, in the NPDES Industrial Discharge Permit Modification Application Report, provided at p. 40 of the modification application in Ex. J.2. **NPDES 1200-C Construction Stormwater**: During construction of the LNG storage tanks and other facilities, disturbed soils will be exposed to potential erosion. To minimize these impacts, land disturbing and construction activities will be conducted in compliance with NPDES General Permits 1200-C for stormwater discharges during construction activities. There will be four 1200-C permits to cover the following areas: (1) the LNG Terminal site, (2) the Kentuck Slough mitigation site, (3) APCO, and (4) the Pipeline within the coastal zone. Because the 1200-C permit applications cannot be approved until construction level detail is available, Applicants, DLCD, and DEQ are coordinating on the 1200-C applications. To support a finding of consistency with the enforceable policies, Applicants have included as exhibits to this Application, copies of substantially complete 1200-C applications. *See* Exs. I.1-5. Applicants expect that DLCD will certify CZMA consistency at this time, conditioned upon obtaining all final 1200-C permits based on final design and engineering, prior to construction, as is a routine practice in these situations. *See* 15 C.F.R. § 930.62(d). These documents, permits, and permit applications demonstrate that the Project will comply with the current edition of ORS Ch. 468B. The 2013 edition of ORS Ch. 468B is approved in the OCMP. With the exception of a few unrelated amendments, detailed in Table 3, the applicable provisions of ORS Ch. 468B have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Ch. 468B.
468.936 Unlawful air pollution in the second degree 468.939 Unlawful air pollution in the first degree 468.941 Determination of number of punishable offenses under ORS 468.936 and 468.939 468.943 Unlawful water pollution in the second degree 468.946 Unlawful water pollution in the first degree 468.949 Determination of number of punishable offenses under ORS 468.943 and 468.946 468.951 Environmental endangerment	Type B State NSR application for a Standard ACDP; 401 Water Quality Certification; NPDES Wastewater Discharge Permit; NPDES 1200-C Construction Stormwater Permits	Oregon Department of Environmental Quality	LNG Terminal and Pipeline within Coastal Zone	ORS 468.936-.951 criminalize violations of the aforementioned air and water quality laws. As discussed and demonstrated *supra*, the Project has and will continue to comply with all air and water quality laws. As such, no environmental crimes will be committed, and the Project will necessarily comply with the current edition of ORS 468.936-.951. The 2013 edition of ORS Ch. 468 is approved in the OCMP. As documented in Table 3, the applicable provisions of ORS Ch. 468 have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Ch. 468.
*The OCMP has approved the 1987 edition of ORS Ch. 469 469.300 Definitions 469.310 Policy 469.320 Siting certificate required; exceptions 469.500 (currently numbered 469.507(1)-(4)) 469.510 (currently numbered 469.501e, .501g, .501i, .501k, .501m, and 469.504)	n/a	Oregon Department of Energy, Oregon Energy Facility Siting Council ("EFSC")	n/a	ORS 469.500(1) (1987) authorizes EFSC to adopt standards for "all thermal power plants." Under ORS 469.300(21) (1987), a "thermal power plant" is a "facility using any source of thermal energy with a nominal electric generating capacity of more than 25,000 kilowatts, for generation and distribution of electricity . . . ." The Project is not a "thermal power plant" subject to EFSC jurisdiction because it will not have a nominal generating capacity of more than 25,000 kilowatts. *See* Ex. Q. As such, the enforceable policies implemented in ORS 469.300-.320, .500-510 (1987) do not apply. Rather, where EFSC has no jurisdiction over the facility, it is the local land use authority (here, Coos County), and not EFSC, that is responsible for the necessary land use approvals. Consistency with applicable land use-related enforceable policies is discussed in Table 1.2.
496.012 Wildlife Policy 496.004 Definitions 496.007 "Game bird" defined 496.009 "Game fish" defined 496.012 Wildlife policy 496.162 Establishing seasons, amounts and manner of taking wildlife; rules 496.171 Th or E Wildlife Species. Definitions for ORS 496.171 to 496.182; applicability date 496.182 Protection and conservation programs; mitigation of adverse impact on local economies; compliance by state agencies; rules 498.301 Policy 498.306 Screening or by-pass devices for water diversions; fees; costs 498.316 Exemption from screening or by-pass devices 506.006 General definitions 506.011 Types of marine life defined 506.016 "Salmon" defined 506.025 "Unlawful to buy" defined 506.028 "Conservation" defined 506.109 Food fish management policy 506.220 Erecting markers of closed waters; interference with markers 506.450 Definitions for ORS 506.450 to 506.465; rules 506.455 Policy 506.610 When possession prima facie evidence of taking fish unlawfully 509.001 Definitions 509.112 Wasting food fish 509.115 Placing in waters fish harmful to food fish 509.120 Using electricity to disturb food fish 509.122 Definitions for ORS 509.125 to 509.155 509.125 Placing substances in water to drive fish from closed areas 509.130 Placing substances in water or using explosives to take or destroy food fish 509.140 Placing explosives or harmful substances in waters in course of lawful work; permit 509.505 Placing in water matter injurious to shellfish 509.510 Taking shellfish from marked beds without permission; disturbing beds 509.580 Definitions for ORS 509.580 to 509.590, 509.600 to 509.645 and 509.910; rules 509.585 Fish passage required for artificial obstructions; statewide inventory; waiver of requirement by commission; rules; exemptions 509.600 Destroying, injuring or taking fish near fishway; permits to take fish 509.610 Maintenance of fish passage required 509.625 Power of department to inspect artificial obstructions and have fish passage constructed or remove obstruction	Consultation with Oregon Department of Fish and Wildlife; Fish Passage Plans; In-Water Timing Guidelines	Oregon Department of Fish and Wildlife ("ODFW")	All Project Components	Applicants and their predecessors began communicating with ODFW in relation to the Wildlife Policy set out in ORS 496.12 in July 2006. The most recent meetings with ODFW were in March 2019. Exhibit K.4 describes in detail communications (including meetings, emails, and submittals) with ODFW and other state and federal agencies regarding habitat mapping and mitigation planning associated with the Project. Additionally, the Wildlife Policy is addressed by FERC in the Draft Environmental Impact Statement for the Project. *See* 2019 DEIS, Sections 1.5.2.5, 4.5.1.1, and 4.5.1.1, provided as Ex. C.1. Engagement with ODFW is ongoing to finalize habitat mapping, classifying habitats according to the Wildlife Policy, and developing mitigation to offset impacts. With respect to fish passage, JCEP submitted a Fish Passage Plan Permit Application for the Kentuck and APCO sites on February 22, 2019. *See* Ex. K.1. PCGP has prepared, but has not yet submitted, Fish Passage Plan Permit applications for Pipeline Stream Crossings and for locations where roads affected by Pipeline construction are located near waterbodies. *See* Exs. K.2, K.3. PCGP will supplement this application by providing final Fish Passage Plan Permit applications once they are submitted to ODFW. Additionally, unless authorized otherwise, dredging and other in-water work associated with the construction of the Project will be performed during ODFW's preferred in-water work period for protecting fish and wildlife resources. For the Coos Bay Estuary and River, the preferred period is October 1 through February 15. *See* Ex. E.1, JCEP Removal-Fill Permit Application, Section 8; *see also* ODFW, Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources, 6 (June 2008), https://www.dfw.state.or.us/lands/inwater/Oregon_Guidelines_for_Timing_of_%20InWater_Work2008.pdf. No in-water blasting will occur within the coastal zone. The ongoing consultation with ODFW, fish passage measures, and in-water work timing protocols demonstrate that the Project will comply with the current edition of ORS Chs. 496, 498, 506, and 509. As documented in Table 3, the applicable provisions of ORS Chs. 496, 498, 506, and 509 have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Chs. 496, 498, 506, and 509.
536.220 Policy on water resources generally; integrated state water resources strategy 536.700 "Drainage basin" defined 536.710 Policy 537.010 Definition of "Water Rights Act" 537.110 Public ownership of waters 537.120 Right of appropriation; vested rights protected 537.130 Permit to appropriate water required; notification to owner of certain land 537.135 Permit required to appropriate water for recharging ground water sources;	Limited Water Use License	Oregon Water Resources Department ("OWRD")	Pipeline in Coastal Zone	PCGP has prepared applications for short-term or fixed duration Limited Waster Use Licenses to draw from the Middle Fork Coquille River, East Fork Coquille River, and Coos River to support hydrostatic testing and/or dust control during construction of the Pipeline. Details, including compliance with the water appropriation requirements set forth in ORS Chs. 536 and 537, are provided in the Limited Water Use License Applications. *See* Exs. P.1-3. Because these applications cannot be submitted until during the relevant water year the water is to be used, these applications have not yet been submitted to OWRD. Applicants expect that DLCD will certify CZMA consistency at this time, conditioned upon obtaining all Limited Water Use Licenses within the appropriate timeframe, *i.e.*, within the applicable water year, as is a

Enforceable Policy (ORS §)	State Authorization	Networked Agency	Component	Authorization Status & Statement of Consistency
minimum perennial streamflow required for permit; exception 537.140 Application for permit; contents; maps and drawings 537.150 Filing of application; determination of completeness; initial review; preliminary determination; notice; public comments; fees 537.160 Approval for beneficial use; agreement authorizing use of ditch for waste or seepage water 537.170 Contested case hearing on application; final order; appeal 537.240 Federal permit; time for obtaining; cancellation; time for beginning and completing work 537.400 Reservoir permits 537.410 Failure to commence or complete work, or to properly apply water, as grounds for cancellation of permit; irrigation districts, municipalities and public utilities excepted 537.420 Notice of hearing 537.440 Cancellation of permit; priorities of other permits 537.445 Hearing upon proposal to cancel permit or appropriation; cancellation suspended pending review 537.450 Rules for proof as to work and use of water under permits; noncompliance as evidence in cancellation proceedings 537.505 Short title 537.515 Definitions for ORS 537.505 to 537.795 and 537.992 537.525 Policy 537.535 Unlawful use or appropriation of ground water, including well construction and operation 537.545 Exempt uses; map; filing of use; fee; rules 537.575 Permits granted, approved or pending under former law 537.585 Beneficial use of ground water prior to August 3, 1955, recognized as right to appropriate water when registered 537.595 Construction or alteration of well commenced prior to August 3, 1955, recognized as right to appropriate water when registered 537.605 Registration of right to appropriate ground water claimed under ORS 537.585 or 537.595; registration statement 537.610 Recording registration statement; issuing certificate of registration; effect of certificate; rules; fees 537.615 Application for permit to acquire new right or enlarge existing right to appropriate ground water; plans and drawings 537.620 Determination of completeness of application; initial review; preliminary determination; notice; public comments 537.625 Final order; appeal; contents of permit 537.630 Time allowed for construction work under permit; extension; certificate of completion; survey; ground water right certificate; requirements for supplemental water right 537.635 Assignment of application, certificate of registration or permit 537.680 Taking testimony; inspecting evidence; contesting claim 537.685 Findings of fact and order of determination 537.690 Filing evidence, findings and determinations; court proceedings 537.695 Conclusive adjudication 537.705 Ground water appurtenant; change in use, place of use or point of appropriation 537.730 Designation of critical ground water area; rules; notice 537.780 Powers of Water Resources Commission; rules; limitations on authority 537.795 ORS 537.505 to 537.795 supplementary				routine practice in these situations. *See* 15 C.F.R. § 930.62(d The proposed LNG Terminal facility will use a combination of potable and raw groundwater. *See* Ex. B.1, FERC Terminal Application, Resource Report 2, Water Use and Quality at 4-7; NPDES Permit Modification Application Report, at 4. Potable and raw groundwater will be supplied from the Coos Bay North Bend Water Board ("CBNBWB") via existing pipelines. The CBNBWB potable water system relies primarily on surface water from reservoirs that is treated in the CBNBWB drinking water treatment plant. Potable water will satisfy normal operational water needs at the LNG Terminal, including fire water makeup, utility water, and potable water. A portion of the utility water will be demineralized for use as makeup to a steam system and acid gas removal unit. Raw groundwater, supplied from the CBNBWB raw water pipeline, will be used for construction water, including LNG tank hydrotesting. The raw water pipeline will remain connected after construction, use of raw water is not anticipated for normal facility operations, though raw water will be used to supplement discharge flow out the industrial wastewater pipeline ("IWWP") to maintain a minimum flow rate for operation of the wastewater diffuser. Additional information about water sourcing and consistency with current water resources laws is discussed in the FERC Application, Resource Report 1, at secs. 1.3.8.6, 1.5.8.8, and Resource Report 2, at secs. 2.1, 2.2., App. B.2 and Table 2.1-1, provided in Ex. B. As the prepared Pipeline permit applications and the above documents show, the Project will comply with the current edition of ORS Chs. 536 and 537. The 2013 edition of these chapters is approved in the OCMP. With the exception of a few unrelated amendments, detailed in Table 3, the applicable provisions of ORS Chs. 536 and 537 have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Chs. 536 and 537.
564.100 Definitions for ORS 564.100 to 564.135 564.115 Protection and conservation programs; action by state agencies; alternatives; findings required if agency fails to adopt alternatives 564.120 Transactions in threatened or endangered [plant] species; restrictions; prohibition	Consultation with Oregon Department of Agriculture	Oregon Department of Agriculture ("ODA")	LNG Terminal and Pipeline in Coastal Zone	Applicants' predecessors were in contact with ODA from as early as 2006 regarding potential impacts to State-listed plant species. Since 2007 to as recently as 2018, plant surveys have been completed on private lands where survey permission has been received, and the following Oregon-listed threatened or endangered plant species have been documented on or in close proximity (within 30 meters) of the Pipeline on private lands: Applegate's milkvetch (federally and state endangered), Kincaid's lupine (federally and state threatened), Gentner's fritillary (federally and state endangered), and Pt. Reyes' birds-beak (no federal status; state endangered). No listed plants were observed on State-managed lands. With FERC DEIS-recommended revisions, *see* Ex. C.1, DEIS, Section 4.6.1.6, to the proposed Pipeline route to avoid potential direct effects to Gentner's fritillary, no direct impacts to the species listed above are expected associated with the Project. See also DEIS at § 4.6.3.3, Table 4.6.1-1. Surveys for Cox's mariposa lily (federal species of concern; state endangered) have been completed on BLM-managed lands, but no permission to survey private lands adjacent to documented populations on BLM-managed lands has been received. Given the presence on BLM-managed lands and suitable habitat for Cox's mariposa lily, it is suspected that this species likely also occurs on adjacent private lands and, therefore, could be affected by the Pipeline. Species observations on private lands to which Applicants have been able to obtain access starting in 2007 have been sent to the Oregon Biodiversity Information Center for their database. In accordance with current ODA guidelines, once the final Pipeline route has been determined, surveys will be completed for the final route and the survey results will be submitted to ODA. Potential impacts to state-listed plant species are discussed further in the FERC Application Resource Report 3, Fish, Wildlife, and Vegetation, at sec. 3.4, and Table 3.4-1. Thus, the Project will comply with the current edition of ORS Ch. 564. As documented in Table 3, the applicable provisions of ORS Ch. 564 have not changed since 2013. Therefore, the Project is and will be conducted in a manner consistent with the OCMP enforceable policies implemented through ORS Ch..

Table 3. Changes to Identified Enforceable Policies Post-Oregon Coastal Management Plan Approval

The following table, based on the initial DLCD-provided list of enforceable policies of the OCMP, outlines changes between the current edition of referenced statutory provisions and the edition approved in the OCMP. Any changes are identified in the right-hand column. Where no changes were identified, the right-hand column is left blank. For certain provisions that have been recodified over the years, the current numbering is provided in the right-most column.

ENFORCEABLE POLICIES	Statute Section Title	Post-OCMP Approval Changes (Unchanged provisions left blank)
ORS Chapter 196 (Removal-Fill)	.682 Permits required for removal or fill; conditions on issuance of permit	
	.687 Regulation of alteration or fill of artificially created wetlands	
	.800 Definitions for ORS 196.600 to 196.905	
Statute Edition 2013 approved in Program	.805 Policy	
	.810 Permit required to remove material from bed or banks of waters; status of permit; exceptions; rules	196.810, .815, and .825 amended to address specific requirements for ocean renewable energy facilities. (Laws 2015, c. 386, § 11, eff. June 11, 2015).
	.815 Application for permit; rules; fees; disposition of fees	
	.816 General permits allowing removal of certain amount of material for maintaining drainage; rules; waiver of fees	
	.817 General permits; rules	
	.818 Wetland delineation reports; review by Department of State Lands; fees; rules	See above
	.825 Criteria for issuance of permit; conditions; consultation with public bodies; hearing; appeal	
	.830 Estuarine resource replacement as condition for fill or removal from estuary; considerations; other permit conditions	
	.845 Investigations and surveys	
	.850 Waiving permit requirement in certain cases; rules; notice; review; fees; disposition of fees	
	.855 Noncomplying removal of material or filling as public nuisance	196.905 amended to exempt from requirements certain removal-fill activities in exclusive farm use, forest use, or mixed farm and forest zones. (Laws 2017, c. 428, § 1, eff. Jan. 1, 2018).
	.880 Fill under permit presumed not to affect public rights; public rights extinguished	
	.905 Applicability; rules	
ORS Chapter 273 (State Lands-Generally)	.551 Drilling Leases; Mining and drilling leases on state lands; fee	
	.553 South Slough Estuary; South Slough National Estuarine Research Reserve; agreement between Oregon and federal government; rules	
	.554 South Slough National Estuarine Research Reserve Management Commission; powers; rules; fees; membership; procedures; expenses	
Statute Edition 2013 approved in Program	.775 Mineral and Geothermal Resource Rights; Definitions for ORS 273.775 to 273.790	
	.780 Retention of mineral and geothermal resource rights by state; exploration permit or lease; sale or exchange	
	.785 Application of ORS 273.551 and 273.775 to 273.790; rules	
ORS Chapter 274 (Submersible and Submerged)	.005 Definitions	274.040 amended to exempt ocean renewable energy facilities from certain lease requirements. (Laws 2015, c. 386, § 7, eff. June 11, 2015). 274.043 amended to allow DSL to add exemptions to leasing requirements by rulemaking. (Laws 2015, c. 205, § 1, eff. June 2, 2015).
	.025 Jurisdiction over submersible and submerged lands generally	
	.040 Sale or lease of submersible lands; easements; occupation of submerged and submersible lands for water works	
Statute Edition 2013 approved in Program	.043 Exemptions from leasing requirements; rules; registration; use without charge; use with charge; indemnification	
	.060 Regulation of harbor improvements; oyster beds; public easement in submerged and submersible lands	
	.400 Beds of Streams, Lakes, Bays; Definition for ORS 274.400 to 274.412	
	.402 Exclusive jurisdiction to assert title to submerged or submersible lands in navigable waterway	
	.425 Definition for ORS 274.430 to 274.520	
	.430 State ownership of meandered lakes; status as navigable and public waters	
	.440 Acquisition of future rights to meandered lakes denied; extension of riparian ownership; lands overflowed by high water	
	.525 Removing Materials; City use of stream bed material	
	.530 Lease or license of stream beds for removal of material; rules for measurement of volume removed	
	.550 Removal of material without payment of royalties; eligible material and uses	
	.560 Lease terms; bond or security; prohibited lease or purchase option; monthly reports and payments; rules	

	.705 Tidal Submersible and Submerged; Definitions for ORS 274.705 to 274.860	
	.710 Jurisdiction of department over tidal submerged lands; easements; leases for oil, gas and sulfur	
	.715 Sulfur leases	
	.725 Scope of leases and permits; persons ineligible	
	.735 Application for survey permit; effect of permit; rules	
	.740 Issuance of survey permit; renewal; reports	
	.745 Drilling logs and records	
	.760 Considerations involved in granting lease or easement	
	.770 Prohibited drilling requirements	
	.790 Royalties	
	.805 Drill sites	
	.810 Commencement of drilling; operational requirements	
	.820 Water contamination or pollution	
	.825 Nonconflicting use of leased lands	
	.830 Protecting lands from drainage	
	.835 Conformance to laws and regulations; periodic negotiations	
	.840 Continuation of lease after cessation of production	
	.850 Cancellation of lease; partial retention of leasehold; removal of equipment	
	.855 Restoration of leasehold to original condition	
	.860 Protection and location of filled lands	
	.867 ***(currently numbered 274.879)*** Financial assurance	
	.885 Lease of kelp fields	
	.890 Time allowed lessee for survey and erection of plant; filing copy of survey with department	
	.895 Removing kelp without lease	
	.905 Submersible, submerged and new lands; Definitions for ORS 274.905 to 274.940	274.905 amended to add definition of “historically filled lands” and revise definition of “new lands” to include only lands created since May 28, 1963. (Laws 2015, c. 804, § 5, eff. July 27, 2015, operative Jan. 1, 2016).
	.920 Creation of new lands upon submersible or submerged lands	274.940 amended to prescribe procedures for how state may assert title to or other interest in historically filled lands (*Id.*)
	.940 Reservation of historically filled lands or new lands	
ORS Chapter 390	.010 Policy of state toward outdoor recreation resources	
(Parks and Recreation; Ocean Shores)	.235 Archeological Sites and Historic Material; Permits and conditions for excavation or removal of archaeological or historical material; rules; criminal penalty	390.235 revised with respect to public universities’ handling of archeological materials. (Laws 2015, c. 767, § 171, eff. July 27, 2015).
	.237 Removal without permit; exceptions	
Statute Edition 2013 approved in Program	.605 Ocean Shores; Definitions	
	.610 Policy	
	.615 Ownership of Pacific shore; declaration as state recreation area	
	.640 Permit required for improvements on ocean shore; exceptions	
	.650 Improvement permit procedure; fee; waiver or reduction	
	.655 Standards for improvement permits	
	.661 Improvement without permit or contrary to permit conditions as public nuisance	
	.663 Investigation of violation within ocean shore; cease and desist order; enforcement of order by state and local police	
	.666 Revocation, suspension or nonrenewal of improvement permit	
	.669 Action by state or any person to abate public nuisance; temporary restraining order or preliminary injunction; compensation to public	
	.678 Motor vehicle and aircraft use regulated in certain zones; zone markers; proceedings to establish zones	
	.705 Prohibition against placing certain conduits across recreation area and against removal of natural products	

	.715 Permits for pipe, cable or conduit across ocean shore, state recreation areas and submerged lands .725 Permits for removal of products along ocean shore; rules .729 Permits for operation of all-terrain vehicles on ocean shore .760 Exceptions from vegetation line .770 Vegetation line described .805 Scenic Waterways; Definitions for ORS 390.805 to 390.925 .826 Designated scenic waterways .835 Highest and best use of waters within scenic waterways; prohibitions; authority of various agencies; water rights; conditions; recreational prospecting; placer mining .845 Administration of scenic waterways and related adjacent lands; limitations on use; condemnation; rules	
ORS Chapter 454 *(Sewage and Disposal Systems)* *Statute Edition 2013 approved in Program*	.605 Definitions for ORS 454.605 to 454.755 .607 Policy .610 Regulation of gray water discharge; permit; rules .655 Permit required for construction; application; time limit; special application procedure for septic tank installation on parcel of 10 acres or more .657 Variance from subsurface sewage disposal system rules or standards; conditions; hearing	
ORS Chapter 465 *(Hazardous Waste and Materials)* *Statute Edition 2001 approved in Program*	EPs within ORS 465.003 to 465.037 EPs within ORS 465.101 to 465.180 EPs within ORS 465.200 to 465.455 EPs within ORS 465.475 to 465.482 EPs within ORS 465.500 to 465.555 EPs within ORS 465.900 to 465.992	
ORS Chapter 468 *(Env Quality Generally)* *Statute Edition 2013 approved in Program*	.936 Unlawful air pollution in the second degree .939 Unlawful air pollution in the first degree .941 Determination of number of punishable offenses under ORS 468.936 and 468.939 .943 Unlawful water pollution in the second degree .946 Unlawful water pollution in the first degree .949 Determination of number of punishable offenses under ORS 468.943 and 468.946 .951 Environmental endangerment	
ORS Chapter 468A *(Air Quality)* *Statute Edition 2013 approved in Program*	468A.005 Definitions for air pollution laws 468A.010 Policy 468A.020 Application of air pollution laws 468A.025 Air purity standards; air quality standards; treatment and control of emissions; rules 468A.040 Permits; rules 468A.045 Activities prohibited without permit; limit on activities with permit 468A.050 Classification of air contamination sources; registration and reporting of sources; rules; fees 468A.055 Notice prior to construction of new sources; order authorizing or prohibiting construction; effect of no order; appeal 468A.060 Duty to comply with laws, rules and standards 468A.070 Measurement and testing of contamination sources; rules 468A.075 Variances from air contamination rules and standards; delegation to local governments; notices	468A.020 amended to refer to air “pollution” rather than “quality” laws and to exempt from certain requirements carbon dioxide emissions from biomass combustion or decomposition. (Laws 2015, c. 500, § 1, eff. June 18, 2015).

Motor Vehicle Pollution Control	EPs within 468A.350 to 468A.455
Solid Fuel Burning Devices	EPs within 468A.460 to 468A.515
Chlorofluorocarbons and Halon Control	EPs within 468A.625 to 468A.645
Aerosol Spray Control	EPs within 468A.650 to 468A.660
Asbestos Abatement Projects	EPs within 468A.700 to 468A.760
Indoor Air Pollution Control	EPs within 468A.775 to 468A.785
Diesel Engines	EPs within 468A.793 to 468A.803

ORS Chapter 468B *Statute Edition 2013 approved in Program* *Water Pollution Control-Surface Water*	468B.005 Definitions for water pollution control laws 468B.015 Policy 468B.020 Prevention of pollution 468B.025 Prohibited activities 468B.040 Certification of hydroelectric power project; comments of affected state agencies 468B.045 Certification of change to hydroelectric power project; notification of federal agency 468B.046 Reauthorization of hydroelectric project not to limit authority of department related to certification of project for water quality purposes 468B.048 Rules for standards of quality and purity; factors to be considered; meeting standards 468B.050 Water quality permit; issuance by rule or order; rules 468B.052 Fees for water quality permit to operate suction dredge 468B.055 Plans and specifications for disposal, treatment and sewerage systems 468B.060 Liability for damage to fish or wildlife or habitat; agency to which damages payable 468B.070 Prohibited activities for certain municipalities 468B.075 Definitions for 468B.080 468B.080 Prohibitions relating to garbage or sewage dumping into waters of state 468B.083 When motor vehicle parts may be placed in waters of state; rules 468B.085 Depositing vehicles or manufactured structures into water prohibited 468B.090 Permit authorized for discharge of shrimp and crab processing byproducts; conditions 468B.093 General permit for discharge of geothermal spring water to surface water 468B.095 Use of sludge on agricultural, horticultural or silvicultural land; rules	468B.052 repealed, abolishing specific fees for permits to operate certain suction dredges (Laws 2017, c. 300, § 9, eff. Jan. 1, 2018.)
Water Pollution Control-Phosphate Cleansing Agents	468B.120 Definitions for 468B.120 to 468B.135 468B.125 Policy to reduce phosphorous pollution 468B.130 Prohibition on sale or distribution of cleaning agents containing phosphorous; rules 468B.135 Exemptions	
Water Pollution Control-Persistent Pollutants	EPs within 468B.138 to 468B.144	
Water Pollution Control-Ground Water	468B.150 Definitions for 468B.150 to 468B.190 468B.155 State goal to prevent ground water contamination 468B.160 Ground water management and use policy	
Animal Waste Control		
Oil or Haz Material Spillage-Generally	EPs within 468B.200 to 468B.230 468B.300 Definitions for 468B.300 to 468B.500 468B.305 Entry of oil into waters of state prohibited; exceptions 468B.310 Liability for violation of 468B.305; exceptions 468B.315 Duty to collect and remove oil; dispersal of oil 468B.320 Action by state; liability for state expense; order; appeal	468B.310 amended to exempt land bank authorities from liability under Oregon's cleanup law in certain circumstances. (Laws 2015, c. 631, § 11, eff. Jan. 1, 2016).
Oil or Haz Material Spillage-Contingency Planning	468B.337 Liquefied natural gas 468B.345 Oil spill contingency plan required to operate facility or covered vessel in state or state waters; exceptions 468B.350 Standards for contingency plans; oil spill response zones; rules 468B.355 Contingency plans; participation in maritime association; lien; liability of maritime association; exemption from liability 468B.360 Review of contingency plan 468B.365 Plan approval; change affecting plan; certificate of approval 468B.370 Determination of adequacy of plan; practice drills; rules 468B.375 Inspection of facilities and vessels; coordination with State of Washington	

	468B.380 Tank vessel inspection program; rules	
	468B.385 Modification of approval of contingency plan; revocation of approval; violation	
	468B.390 Compliance with federal Oil Pollution Act of 1990; proof of financial responsibility	
Oil or Haz Material Spillage-Willful Discharge	468B.450 Willful or negligent discharge of oil; civil penalty; authority of director to mitigate	
	468B.460 Rules	
Oil or Haz Material Spillage-Shipping	468B.475 Legislative finding; need for evidence of financial assurance for ships transporting oil	
	468B.485 Methods of establishing financial assurance	
ORS Chapter 469	.300 Definitions	1987 version of ORS Ch. 469 addressed directly in Table 2.
(Energy)	.310 Policy	
Statute Edition 1987 approved in Program	.320 Siting certificate required; exceptions	
	.500 ***(currently numbered 469.507. Following are EPs: .507(1), .507(2), .507(3), .507(4))***	
	.510 ***(currently numbered 469.501 and 469.504. Following are EPs: .501e, .501g, .501i, .501k, .501m, and 469.504)***	
ORS Chapter 496	.004 Definitions	
(Wildlife Administration)	.007 “Game bird” defined	
	.009 “Game fish” defined	
Statute Edition 2013 approved in Program	.012 Wildlife policy	
	.162 Establishing seasons, amounts and manner of taking wildlife; rules	
	.171 Th or E Wildlife Species. Definitions for ORS 496.171 to 496.182; applicability date	
	.182 Protection and conservation programs; mitigation of adverse impact on local economies; compliance by state agencies; rules	
ORS Chapter 498	.301 Policy	
(Fish Screening)	.306 Screening or by-pass devices for water diversions; fees; costs	
	.316 Exemption from screening or by-pass devices	
Statute Edition 2013 approved in Program		
ORS Chapter 506	.006 General definitions	
(Commercial Fishing and Fisheries)	.011 Types of marine life defined	
	.016 “Salmon” defined	
Statute Edition 2013 approved in Program	.025 “Unlawful to buy” defined	
	.028 “Conservation” defined	
	.109 Food fish management policy	
	.220 Erecting markers of closed waters; interference with markers	
	.450 Definitions for ORS 506.450 to 506.465; rules	
	.455 Policy	
	.610 When possession prima facie evidence of taking fish unlawfully	
ORS Chapter 509	.001 Definitions	
(Additional Fishery Requirements)	.112 Wasting food fish	
	.115 Placing in waters fish harmful to food fish	
Statute Edition 2013 approved in Program	.120 Using electricity to disturb food fish	
	.122Definitions for ORS 509.125 to 509.155	
	.125 Placing substances in water to drive fish from closed areas	
	.130 Placing substances in water or using explosives to take or destroy food fish	
	.140 Placing explosives or harmful substances in waters in course of lawful work; permit	
	.505 Placing in water matter injurious to shellfish	
	.510 Taking shellfish from marked beds without permission; disturbing beds	
	.580 Definitions for ORS 509.580 to 509.590, 509.600 to 509.645 and 509.910; rules	

	.585 Fish passage required for artificial obstructions; statewide inventory; waiver of requirement by commission; rules; exemptions .600 Destroying, injuring or taking fish near fishway; permits to take fish .610 Maintenance of fish passage required .625 Power of department to inspect artificial obstructions and have fish passage constructed or remove obstruction
ORS Chapter 517 *(Mining and Mining Claims)* *Statute Edition 1987 approved in Program*	EPs within ORS 517.750 to 517.790
ORS Chapter 520 *(Conservation of Gas and Oil)* *Statute Edition 1987 approved in Program*	EPs within ORS 520.005 to 520.095
ORS Chapter 527 *(Forest Practices)* *Statute Edition 1991 approved in Program*	.620 Definitions for ORS527.610 to 527.770 .630 Policy .660 Committtees to review rules .670 Commencement of operations; when notice and written plan required; notice of chemical application; appeal of plan .700 Appeals from order of State Forester; hearings procedure; stay of operation .710 Duties and powers of board; rules to protect resources; inventory for resource protection; consultation with other agencies .722 Restrictions on local government adoption of rules regulating forest operations; exceptions .990 Criminal penalties
ORS Chapter 536 *(Water Resources Administration)* *Statute Edition 2013 approved in Program*	.220 Policy on water resources generally; integrated state water resources strategy .700 Drainage basin" defined .710 Policy

Ground Water	.349 Processing request for in-stream water right. .350 Legal status of in-stream water right. .352 Precedence of uses. .400 Reservoir permits. .410 Failure to commence or complete work, or to properly apply water, as grounds for cancellation of permit; irrigation districts, municipalities and public utilities excepted. .420 Notice of hearing. .440 Cancellation of permit; priorities of other permits. .445 Hearing upon proposal to cancel permit or appropriation; cancellation suspended pending review. .450 Rules for proof as to work and use of water under permits; noncompliance as evidence in cancellation proceedings. .505 Short title. .515 Definitions for ORS 537.505 to 537.795 and 537.992. .525 Policy. .535 Unlawful use or appropriation of ground water, including well construction and operation. .545 Exempt uses; map; filing of use; fee; rules. .575 Permits granted, approved or pending under former law. .585 Beneficial use of ground water prior to August 3, 1955, recognized as right to appropriate water when registered. .595 Construction or alteration of well commenced prior to August 3, 1955, recognized as right to appropriate water when registered. .605 Registration of right to appropriate ground water claimed under ORS 537.585 or 537.595; registration statement. .610 Recording registration statement; issuing certificate of registration; effect of certificate; rules; fees. .615 Application for permit to acquire new right or enlarge existing right to appropriate ground water; plans and drawings. .620 Determination of completeness of application; initial review; preliminary determination; notice; public comments .625 Final order; appeal; contents of permit. .630 Time allowed for construction work under permit; extension; certificate of completion; survey; ground water right certificate; requirements for supplemental water right. .635 Assignment of application, certificate of registration or permit .680 Taking testimony; inspecting evidence; contesting claim. .685 Findings of fact and order of determination. .690 Filing evidence, findings and determinations; court proceedings. .695 Conclusive adjudication. .705 Ground water appurtenant; change in use, place of use or point of appropriation. .730 Designation of critical ground water area; rules; notice .780 Powers of Water Resources Commission; rules; limitations on authority. .795 ORS 537.505 to 537.795 supplementary.	537.610 and 537.620 amended to increase registration certificate and permit fees. (Laws 2017, c. 571, §§ 5, 6, eff. July 19, 2017, operative July 1, 2017). See above. 537.630 amended to define “undeveloped portion” of a water right and add certain requirements for permit for municipal use. (Laws 2017, c. 704, § 4, eff. Aug. 15, 2017).
ORS Chapter 543 (Hydroelectric Projects) *Statute Edition 2013 approved in Program*	.012 Applicability of chapter to reauthorization of existing hydroelectric project. .014 repealed by 2015 c.386 §15 .015 Policy. .017 Minimum standards for development of hydroelectric power; public interest considerations; rules. .060 Investigations; access to project, maps, books and other project data. .110 Appropriation and use of water for power is governed by this chapter. .120 Water power projects to be in conformity with this chapter. .140 Projects or developments constructed by federal government excepted from law. .150 Municipal corporations and utility districts; applicability of laws; powers of commission respecting districts. .210 Preliminary permits; application; contents; fee.	

	.225 Hearing on application; notice; policy. .250 Permit; duration; transfer; cancellation; priority; terms and conditions; denial. .255 Determination of cumulative impacts of proposed hydroelectric power projects; consolidated review; applicability. .260 Licenses; duration; terms and conditions; termination; denial of application; preference of municipality or utility district. Hy .265 Testing of fish protection measures as condition for hydroelectric project permit or license; scope and cost. .270 Preference in granting permit or license; municipal use. .280 Fee payments by licensee. .290 Filing of maps, plans, estimates and other materials; incorporation as part of license; alteration; further statements and data. .300 Conditions governing license; fees; waiver of conditions. .410 Construction of project; time for commencement and completion; supply of service; extension of time; nonperformance; termination of license. .440 Transfer of license, rights or property; effect. .610 Acquisition of project by state or municipality. .760 Definition of water right. .765 Certificate to use water for hydroelectric purposes within artificial delivery system; expedited application process; certificate conditions; annual payments; fees.	
ORS Chapter 564 *(Threatened of Endangered Plants)* *Statute Edition 2013 approved in Program*	.100 Definitions for ORS 564.100 to 564.135 .115 Protection and conservation programs; action by state agencies; alternatives; findings required if agency fails to adopt alternatives .120 Transactions in threatened or endangered species; restrictions; prohibition	

STATEWIDE PLANNING GOALS

Statewide Planning Goal 2	Pg 2. Part II- Exceptions	
Statewide Planning Goal 6	Pg 1. First paragraph (unbolded)	
Statewide Planning Goal 8	Pg 2. Siting Standards Pg 3-7 Definitions	
Statewide Planning Goal 16	Pg 1. Column 2: Introduction: Protection for estuarine ecosystems and priorities listed for management and use of estuarine resources. Pg 2. Column 1 thru Pg 4 Column 2: Management Units: Estuary resources maintained through three management units; definition of units and list of specific uses allowed in each unit. Pg 4 Column 2: Implementation Requirements, #1: Impacts assessment needed for actions that could alter the estuarine ecosystem and contents of assessment described. Pg 5 Column 1: Implementation Requirements, #2: Limitations on dredging/filling Pg 6 Column 1: Implementation Requirements, #5: Mitigation required when dredge/fill is permitted in intertidal or tidal marsh areas. Pg 6 Column 1: Implementation Requirements, #6: Prohibition on dredge material disposal in intertidal or tidal marsh areas Pg 6 Column 1: Implementation Requirements, #7: Limitions on size and shape of over water-structures and alternatives to over-water structures must be considered.	
Statewide Planning Goal 17	Pg. 2 Column 2 thru Pg. 3 Column 1: Identification of Coastal Shorelands; definition of coastal shorelands. Pg. 3 Column 1: Coastal shoreland Uses: Protection for significant areas and allowed uses. Pg. 3 Column 1 to Column 2: Location of shorelands: Protection for water-dependent uses in certain areas of shorelands. Pg. 3 Column 2 to Pg. 4 Column 1: Permissible Nonwater-Dependent Uses; definition of permissible nonwater-dependent uses. Pg. 4 Column 2: Implementation Requirements: #3: Dredged material disposal site protection from new uses Pg. 4 Column 2 to Pg. 5 Column 1: Implementation Requirements: #4: Riparian vegetation shall be maintained and where appropriate restored and enhanced. Pg. 5 Column 1: Implementation Requirements: #5: Practices and non-structural solutions will be preferred to structural solutions. Pg. 5 Column 1: Implementation Requirements: #6: Existing public ownership maintained. Pg 7 Column 1: Examples of Incidental Uses: Definitions of conjunction and incidental to water-dependent use; clarifies permissible nonwater-dependent use definition.	

COOS COUNTY

COOS COUNTY COMPREHENSIVE PLAN (CCCP) *CCCP Volume I, Part 1, Section 5: Plan Provisions* **2013 version**	Section 5.2, Strategies 2, 14 Plan policies regarding Land Use & Community Development Section 5.3, Strategies 1, 10, 12, 13 Plan policies regarding Agricultural Lands Section 5.4, Strategies 1, 3, 9 Plan policies regarding Forest Lands Section 5.5, Strategies 1, 2, 4 Plan policies regarding Mineral and Aggregate Resources Section 5.6, Strategies 1, 6 Plan policies regarding Fish and Wildlife Habitats Section 5.7, Strategy 3 Plan policies regarding Historical & Archaeological Resources, Natural Areas, etc. Section 5.10, Strategies 1, 2, 3, 5, 7, 8, 9, 10, 11 Plan policies regarding Dunes, and Ocean and Coastal Lake Shorelands Section 5.11 Strategies 1, 4, 6, 7 Plan policies regarding Natural Hazards Section 5.18 Strategies 4, 4a, 5, 6 Plan policies regarding Public Facilities Section 5.22, Strategy 2 Plan policies regarding Urbanization	* On Feb. 22, 2019, DLCD provided the Applicants with local copies of approved prior editions of the applicable land use enforceable policies. Some of the local copies do not contain effective dates, that is, for some of the applicable enforceable policies, the exact date of the approved edition provided is unclear. In those cases, the Applicants compared the local copies provided by DLCD with the most current edition available through the local jurisdiction to identify any changes. The local copy of the approved Coos County Comprehensive Plan is one such example. Based on information from Coos County Planning's website, there do not appear to have been any changes between the local copy of CCCP Vol. 1, Part 1, Sec. 5 provided by DLCD and the edition currently available on Coos County Planning's website. See http://www.co.coos.or.us/Portals/0/Planning/Vol%201%20Part%201%20CCP.pdf?ver=2015-05-19-132047-017.
CCCP Volume II, Part 1, Sections 3 and 5: Coos Bay Estuary Management Plan **2013 version**	Section 3.2 (exception: OCM does not approve "Continental Shelf") Definitions same as 2013 Section 3.3 Policy 1 Estuary Classifications Section 3.3 Policy 2 General Schedule of Permitted uses and General Use Priorities Section 3.3 Policy 3 Use of "Coos Bay Estuary Special Considerations Map" as the Basis for Special Policies Implementation Section 3.3 Policy 4, including 4a Resource Capability Consistency and Impact Assessment Section 3.3 Policy 5, including 5a-5d Estuarine Fill and Removal Section 3.3 Policy 6 Fill in Conservation and Natural Estuarine Management Units Section 3.3 Policy 8 Estuarine Mitigation Requirements Section 3.3 Policy 9 Solutions to Erosion and Flooding Problems Section 3.3 Policy 10 Proliferation of Single-Purpose Docks and Piers Section 3.3 Policy 13 Overall Use Priorities within Coastal Shorelands Section 3.3 Policy 14 General Policy on Uses within Rural Coastal Shorelands Section 3.3 Policy 15 Land Divisions within Rural Shorelands Section 3.3 Policy 16, including 16a and 16b Protection of Sites Suitable for Water-Dependent Uses and Special Allowance for new Non-Water- Dependent Uses in "Urban Water-Dependent (UW) Units" Section 3.3 Policy 18 Protection of Historical, Cultural and Archaeological Sites Section 3.3 Policy 19 Management of "Wet-Meadow" Wetlands within Coastal Shorelands Section 3.3 Policy 20, including 20b and 20c Dredged Material Disposal Sites Section 3.3 Policy 22, including 22b Mitigation Sites: Protection Against Preemptory Uses Section 3.3 Policy 25 Waste/Storm Water Discharge Section 3.3 Policy 29 Restricting Actions in Beach and Dune Areas that are "Unsuitable for Development" Section 3.3 Policy 30 Restricting Actions in Beach and Dune Areas with "Limited Development Suitability" and Special Consideration for Sensitive Beach and Dune Resources Section 3.3 Policy 46a Flow-Lane Disposal of Dredged Material Allowed in Development Aquatic Management Units Section 5 ALL Management Units	In what appears to have been a clerical error, DLCD provided Applicants with a local copy of the Coquille River Estuary Management Plan, CCCP Vol. III, rather than the applicable Coos Bay Estuary Management Plan, CCCP Vol. II. Even so, according to the most current edition of the CCCP, Vol. 2, Part 1 available on Coos County Planning's website, there do not appear to have been any changes to CBEMP since 2003. See current version available on the Coos County Planning Website, codified in 2003, available at http://www.co.coos.or.us/Portals/0/Planning/Vol%202%20Part%201%20-%20CBEMP.pdf?ver=2015-05-18-145041-903 (last accessed April 10, 2019).
COOS COUNTY ZONING AND LAND DEVELOPMENT ORDINANCE *Chapters 1-3* **2013 version**	Chapter 1; Section 1.1.300 Requires compliance with provisions of Comprehensive Plan and Ordinances Chapter 2; Sections 2.1.100 – 2.1.200 (exception: OCPM does not approve "Continental Shelf") Definitions Chapter 3; Section 3.2.175 Special allowance for accessory dwellings Chapter 3; Section 3.2.500 Right of way enhancement Chapter 3; Section 3.2.550 Routine road maintenance Chapter 3; Section 3.2.700 Process for tribal review at archeological sites	Several definitions in 2.1.200 amended to address medical marijuana facilities. See ORD AM 15-05-006PL (June 24, 2015), Att. A. Several definitions added in 2017 to "address updates to Exclusions, Definitions, Industrial and Commercial Uses, Land Use Procedures, Lawfully Created Parcels, Property Line Adjustments, Road Standards." ORD AM 17-04-004PL (May 2, 2017).

Currently recodified as:

Chapter 4 **2013 version**	Section 4.1.100 Part B; Establishes overlay zones		
	Section 4.1.100 Part C; Establishes shoreland zones for Coquille River estuary		
	Section 4.1.100 Part D; Establishes aquatic unit zones for Coquille River estuary		
	Section 4.1.200; Zoning District Maps: specifies official zoning maps		
	Section 4.1.450; Interpretation of Shoreland boundary		
	Section 4.2.100; Use Matrices - General		
	Section 4.2.200; Open Space and Natural Resource District: Table 4.2a		
	Section 4.2.300; Resource Zoning Districts: refers to 4.8 and 4.9 for uses		
	Section 4.2.400; Rural Residential and Rural Unincorporated Table 4.2.c		
	Section 4.2.500; Urban Residential Zoning District: Table 4.2.d	Changes to current 4.3.200 reflected in ORD AM 18-09-009PL (Oct. 2, 2018), Att. A at 11-18.	4.3.200
	Section 4.2.600; Commercial – Industrial Zoning District: Table 4.2.e		4.3.200
	Section 4.2.700; Commercial – Industrial Rural Communities: Table 4.2.f		
	Section 4.2.800; Commercial – Industrial Urban Communities: Table 4.2.g		
	Section 4.2.900; Review Standards and Conditions (refers to tables)		
	Section 4.3.100; Use Matrix—CREMP Aquatic Units		
	TABLE 4.3a; CREMP Estuarine Uses/Activities Matrix		
	Section 4.4.100; Applies generally to 4.2.200 – 4.2.600		
	Section 4.4.200; Open Space and Natural Resource Districts		
	Section 4.4.300; General Standards for Resource Zoning Districts		
	Section 4.4.400; General Standards for Rural Residential Zoning Districts		
	Section 4.4.500; General Standards for Urban Residential Zoning Districts		
	SectioN 4.4.550; Manufactured Homes in Urban Residential Districts		
	Section 4.4.600; Commercial – Industrial Districts		
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	Section 4.5.175; Site-Specific Zoning Districts		3.2.175
	Section 4.5.180.2; Riparian protection standards re existing structures	Section 4.5.100 amended in 2015 to add requirements for carnivals and solar energy systems. ORD AM 14-09-011PL (Feb. 3, 2015).	3.2.180
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	Section 4.5.210; Management Objectives for ISSDNC-DA		
	Section 4.5.211; Table ISSDNC-DA		
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	Section 4.5.242.01; Management Objectives for 3-NWD		
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	Section 4.8.500; “Lot-of-Record” Dwellings		
	Section 4.8.525; Forest Dwellings		
	Section 4.8.600; Mandatory Siting Standards Required for Dwellings and Structures in the Forest Zone		4.6.140
	Section 4.8.700; Fire Siting and Safety Standards		4.6.140
	Section 4.8.750; Development Standards		
	Section 4.8.800; Land Divisions in the Forest Zone		
	Section 4.9.200; Uses Permitted Outright	Sec. 4.6.200-.230 amended to add as permitted or conditional uses utility facilities over and under public roads; certain water features; filming; wind, solar, and geothermal electricity; wineries; solid waste disposal sites; and other recreational , farm, and residential uses in the EFU zone. See ORD AM-15-05-004PL (July 15, 2015), Att. A.	4.6.200
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	Section 4.9.550; Non-Farm Dwellings		
	Section 4.9.600; Siting Standards for Dwellings and Structures in EFU Zone		
	Section 4.9.700; Development Standards		
	Section 4.9.900; Land Divisions		

CITY OF COOS BAY

CITY COOS BAY COMPREHENSIVE PLAN (CBCP) *CBCP Chapter 7*	Section 7.1, NRH.1 Natural Resources and Hazards Section 7.1, NRH.6 Natural Resources and Hazards Section 7.1, NRH.1.1 Regulation in dune areas to protect water quality Section 7.3, HP.3 Historic Preservation Section 7.4, R.6 Recreation and Open Space (buffer area) Section 7.7, PFS.10 Public Facilities and Services (coordination with Coos Bay-North Bend Water Board) Section 7.7, PFS.11 Public Facilities and Services (providing sewer service outside city limits) Section 7.9, UGM.9 Urban Growth Management (prohibits annexation solely for sewer service) Section 7.10, ER.1 Estuarine Resources (adoption of Coos Bay Estuary Management Plan provisions)
CITY COOS BAY LAND DEV. ORDINANCE *TITLE 17 Division 1* **2013 version**	Chapter 17.05, 17.05.20; 17.05.30 General Chapter 17.10, 17.10.010 Definitions Chapter 17.15 , 17.15.010 Land Development Map Chapter 17.20 , 17.20.010 – 17.20.020 Uses of Land Chapter 17.25, 17.25.010 – 17.25.110 Nonconformance
CITY COOS BAY LAND DEV. ORDINANCE *TITLE 17 Division 2* **2013 version**	Chapter 17.30, Table 17.30.010 Establishment of Zoning Districts Chapter 17.35, 17.35.020 – 17.35.050 R-1 Single Family Residential Chapter 17.40, 17.40.020 – 17.40.050 R-2 Single Family and Duplex Residential Chapter 17.45 17.45.020 – 17.45.050 R-3 Multiple Residential Chapter 17.50 17.50.020 – 17.50.050 R-4P Residential/Professional Chapter 17.55 17.55.020 – 17.55.050 R-5 Residential Certified Factory-built Home Park Chapter 17.60 17.60.020 – 17.60.050 R-W Restricted Waterfront Residential Chapter 17.65 17.65.020 – 17.65.050 MP Medical Park Chapter 17.70 17.70.020 – 17.70.050 C-1 Central Commercial Chapter 17.75 17.75.020 – 17.75.050 C-2 General Commercial Chapter 17.80 17.80.020 – 17.80.050 G-1 General Industrial Chapter 17.85 17.85.020 – 17.85.050 I-C Industrial/Commercial Chapter 17.90 17.90.020 – 17.90.050 W-I Waterfront Industrial Chapter 17.95 17.95.020 – 17.95.050 QP-1 Park/Cemetery Chapter 17.100 17.100.020 – 17.100.050 QP-2 Watershed Chapter 17.105 17.105.020 – 17.105.050 QP-3 Public Educational Facilities Chapter 17.110 17.110.020 – 17.110.030 QP-4 Transportation Facilities Chapter 17.115 17.115.020 – 17.115.060 QP-5 Buffer Chapter 17.120 17.120.020 – 17.120.050 R-6 Single Family/Duplex Residential & Factory-built Chapter 17.125 17.125.020 – 17.125.090 WH Waterfront Heritage Chapter 17.127 17.127.020 – 17.127.100 HP Hollering Place
CITY COOS BAY LAND DEV. ORDINANCE *TITLE 17 Division 3* **2013 version**	Chapter 17.145, 17.145.020 – 17.145.050 Access Management Chapter 17.170, 17.170.010 Utilities and Public Facilities Chapter 17.175, 17.175.010, Drainage Facilities Chapter 17.180, 17.180.010 – 17.180.050 Transportation Standards Chapter 17.185, 17.185.010 – 17.185.020 Open Space Chapter 17.190, 17.190.010 – 17.190.030 Recreational Area Chapter 17.195, 17.195.050 – 17.195.200 Flood Damage Prevention

	Chapter 17.205, 17.205.010 Estuarine and Coastal Shoreland Uses and Activities		
	Chapter 17.210, 17.210.010 Dredged Material Disposal Sites		
	Chapter 17.215, 17.215.010 Land Clearing, Erosion Control, Steep Slopes		
	Chapter 17.220, 17.220.010 Cultural Resources		
	Chapter 17.225, 17.225.010 – 17.225.030 Air Surface Protection		
	Chapter 17.235, 17.235.010 – 17.235.060 Manufactured Home Special Siting Standards		
	Chapter 17.240, 17.240.020-17.240.030 Empire Waterfront Settlement Design Review		
CITY COOS BAY LAND DEV. ORDINANCE	Chapter 17.275, 17.275.010 – 17.280.030 Manufacturing		
TITLE 17 Division 4	Chapter 17.280, 17.280.010 – 17.280.040 Manufacturing		
2013 version			
CITY COOS BAY LAND DEV. ORDINANCE	Chapter 17.320, 17.320.010 – 17.320.080 Land Clearing, Erosion Control, Steep Slope Areas		
TITLE 17 Division 5	Chapter 17.325, 17.325.010 – 17.325.020 Alternatives for Reconfiguration of Property		
2013 version	Chapter 17.330, 17.330.010 – 17.330.080 Land Division-Partition I		
	Chapter 17.335, 17.335.010 – 17.335.090 Land Division-Partition II and Subdivision	Amended to specify that Type I review is required. See current 17.352.020. Some statement of appeal requirements omitted. See current 17.352.080. Several non-substantive, clerical or restructuring changes throughout.	Now codified in Coos Bay Municipal Code Sec. 17.352.010-17.352.080
	Chapter 17.340, 17.340.010 – 17.340.080 Estuarine and Coastal Shorelands Uses and Activity		
	Chapter 17.345, 17.345.010 – 17.345.050 Site Plan and Architectural Review		
	Chapter 17.350, 17.350.010 – 17.350.050 Variance		
	Chapter 17.355, 17.355.010 – 17.355.050 Conditional Use		
	Chapter 17.365, 17.365.020; 17.365.040 - .060 Cultural Resources		
	Chapter 17.390, 17.390.010 – 17.390.070 Architectural Design Review		
CBEMP (EMU's within City of Coos Bay Limits)	Lower Bay/Upper Bay DA All requirements, Aquatic Unit/Deep-Draft Navigation Channel		
Part 1 Section 5	Isthmus Slough DA All requirements, Aquatic Unit/Shallow-Draft Navigation Channel		
2013 version	Coos River/Millicoma R DA All requirements, Aquatic Unit/Shallow-Draft Navigation Channel		
	15-NA All requirements Natural Aquatic		
	16-CA All requirements Conservation Aquatic		
	17-NA All requirements Natural Aquatic		
	16-CA All requirements Conservation Aquatic		
	17-NA All requirements Natural Aquatic		
	18B-CA All requirements Conservation Aquatic		
	20-CA All requirements Conservation Aquatic		
	21-CA All requirements Conservation Aquatic		
	21-RS All requirements Rural Shorelands		
	21A-NA All requirements Natural Aquatic		
	23-DA All requirements Development Aquatic		
	23A-UW All requirements Urban Waterfront		
	23B-UD All requirements Urban Development		
	24-NA All requirements Natural Aquatic		
	24-CS All requirements Conservation Shorelands		
	25-NA All requirements Natural Aquatic		
	26-UD All requirements Urban Development		
	26A-CA All requirements Conservation Aquatic		
	26B-CA All requirements Conservation Aquatic		
	27-UW All requirements Urban Waterfront		
	27-DA All requirements Development Aquatic		
	28-UW/28-D All requirements Urban Waterfront		
	28B-DA All requirements Development Aquatic		
	38-CA All requirements Conservation Aquatic		
	42-UD All requirements Urban Development		
	43-DA All requirements Development Aquatic		
	43-UW All requirements Urban Waterfront		
	44-DA All requirements Development Aquatic		

44-UW All requirements Urban Waterfront	
44a-UW All requirements Urban Waterfront	
44B-UD All requirements Urban Development	
45-CS All requirements Conservation Shorelands	
45-NA All requirements Natural Aquatic	
45A-CA All requirements Conservation Aquatic	
52-CS All requirements Conservation Shorelands	
52-NA All requirements Natural Aquatic	
52A-DA All requirements Development Aquatic	
53-CS All requirements Conservation Shorelands	
53-CA All requirements Conservation Aquatic	
54-DA All requirements Development Aquatic	
54-UW All requirements Urban Waterfront	
55-UD All requirements Urban Development	
55-CA All requirements Conservation Aquatic	
55B-NA All requirements Natural Aquatic	

CITY OF NORTH BEND[9]

NORTH BEND COMPREHENSIVE PLAN (NBCP) **2013 version**	Chapter VI, Public Services/Facilities, Article 6.7.100.1 - 6.7.100.3; 6.7.100-11 Chapter VII, Recreation/Open Space, Article 7.6.100.4 Chapter VIII, Natural Disasters and Hazards, Article 8.5.100.1 Chapter X, Air, Land and Water Quality, Article 10.5.100.3 Chapter XII, Coastal, Article 12.5.100.1 Chapter XIII, Land Use, Article 13.7.100		
ZONING ORDINANCE 1192 **2013 version**	Section 3, Definitions Section 5, Classification of Zones Section 6, Zoning Map Sections 7 - 13, Residential Zones R-7 and R-10 Sections 14 - 20, Residential Zone R-6 Sections 21 - 27, Residential Zone R-5 Sections 28 - 34, Residential Zone R-M Sections 35 - 36, Residential Transition Zone R-T Sections 37 - 42, Limited Commercial Zone C-L Sections 43 - 48, General Commercial Zone C-G Sections 49 - 52, Central Commercial District C-C Sections 53 - 58, Light Industrial District M-L Sections 59 - 61, Heavy Industrial District M-H Sections 62 - 63, Airport Zone A-Z Sections 64 - 69, Floodplain Zone F-P Sections 70, 71, 75, Conditional Uses Sections 76 - 78, Planned Housing Development Sections 79 - 85, Off-Street Parking and Loading Sections 86 - 95, Supplementary Provisions Sections 96 – 103, Non-Conforming Uses and Structures Sections 104 – 106, Variances Section 121, Wetland Notification Procedures	NBMC 18.04.030 amended to add definition of "factory-built housing," "manufactured home," and "temporary workforce housing." See current NBMC 18.04.030(11),(32),(45). Clerical changes throughout to refer to current "title" as opposed to the former "ordinance." M-H zoning provisions amended to add temporary workforce housing as conditional use in M-H zone. See current NBMC 18.44.020(5). Signage limitation in M-H zone rescinded. See current NBMC 18.44.030. F-P provisions amended to refer to most recent (2014) Coos County Flood Insurance Study. See current NBMC 18.48.020.	18.04.030 (recodified within North Bend Municipal Code) 18.04.050 18.04.060 18.40 18.44 18.48
CBEMP (EMU's within City of North Bend Limits) **2013 version**	44-DA All requirements, Development Aquatic 44-UW All requirements, Urban Waterfront 44-UNW All requirements, Urban Non-water Related 46-DA All requirements, Development Aquatic 46-UD All requirements, Urban Development 47-DA All requirements, Development Aquatic 47-UW All requirements, Urban Waterfront 48-CA All requirements, Conservation Aquatic 48A-CA All requirements, Conservation Aquatic 48-CS All requirements, Conservation Shoreland		As adopted in NBMC Ch. 18.88

[9] DLCD has not supplied the Applicants with a list of applicable enforceable policies implemented for the City of North Bend. As suc sions as applicable to the components to be located in the City of North Bend based on the pertinent land use applications. Should DLCD wish to identify these applicable enforceable policies in the future, Applicants will amend and supplement this Application to demonstrate compliance with those enforceable policies.

50-NA All requirements, Natural Aquatic

	50-UD All requirements, Urban Development
	51-CA All requirements, Conservation Aquatic
	51-UD All requirements, Urban Development
	51A-DA All requirements, Development Aquatic
	52-NA All requirements, Natural Aquatic
	53-CS All requirements, Conservation Shoreland

DOUGLAS COUNTY

DOUGLAS COUNTY COMPREHENSIVE PLAN *2015 version approved in Program*	Forest Resource Policies; Policy 2; Land use policy implementation, requires certain farm/forest zones Forest Resource Policies; Policy 3; Timberlands policy implementation, standards for dwellings in timberland areas Natural Features Policies; Habitats; Policy 9; Specifies impact areas around certain habitats Natural Features Policies; Habitats; Policy 10; Specifies impact areas around osprey nests Natural Features Policies; Mineral/Energy; Policy 1; Mineral and aggregate extraction in certain zones Natural Features Policies; Mineral/Energy; Policy 2; Mineral and aggregate extraction in forest zones Natural Features Policies; Significant Wetlands; Policy 2; Prohibits development in certain wetlands Natural Features Policies; Significant Wetlands; Policy 3; Allows development in certain wetlands; prescribes conditions Rural Land Use Policies; Rural Resource Designations; Criteria for designating rural resource lands Rural Land Use Policies; Rural Non-Resource Designations; Criteria for inventorying and designating rural non-resource lands in nine use categories Rural Land Use Policies; Overlay Zones; Table specifies overlay zone designations and relationship to plan policies for twenty overlay zones	Though the DCCP was recodified and restructured in 2017, there do not appear to be any substantive changes with respect to the rural land use provisions identified as enforceable policies. The revised DCCP is available at http://www.co.douglas.or.us/planning/code_enforcement/pdf/CompPlan.pdf.
DOUGLAS COUNTY COASTAL RESOURCES PLAN *2015 version approved in Program*	Element 1: Estuarine Resources; Estuarine Classification System; Specifies 3 EMU classes and criteria Element 1: Estuarine Management Unit Designations; Identifies 20 individual EMUs Element 2: Coastal Shorelands; Shorelands Planning Area Boundary; Specifies 7 criteria for determining boundary of Coastal Shorelands Planning Area Element 2: Costal Shorelands; Shorelands Classificiations system; specifies eleven shoreland classification use categories Element 2: Coastal Shorelands; Shoreland Mgmnt Unit Designations; Identifies and specifies 33 shoreland mgmt units Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 5 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 6 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 8 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 9 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 12 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 13 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 15 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 19 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 20 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 22 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: General policy 23 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: Resource Conservation Shorelands policy 1 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: Urban shoreland policy 1 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: Urban shoreland policy 2 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: Urban shoreland policy 3 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: Rural shoreland policy 1 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: Rural shoreland policy 2 Element 2: Coastal Shorelands; Shoreland Mgmt Policies; Mgmt policies for coastal shorelands: Rural shoreland policy 3 Element 2: Coastal Shorelands; Significant Coastal Wetlands; Table identifies 16 significant coastal wetlands with maps Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredging policy 1 Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredging policy 2 Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredging policy 3	

	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredging policy 4	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredging policy 5	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 1	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 2	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 3	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 4	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 5	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 6	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 7	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 8	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 9	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 10	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 11	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; Dredged materials mgmt policy 12	
	Element 3: Channel Dev and DMD for Umpqua River Estuary; DMD sites 1-11; description, capacity, map etc.	
	Element 4: Restoration and Mitigation; Mitigation Site Inventory; Descriptions of 5 mitigation sites	
	Element 4: Restoration and Mitigation; Restoration Site Inventory- Degraded Estuarine Habitat; Description of 4 restoration sites	
	Element 4: Restoration and Mitigation; Restoration Site Inventory Fill Sites and Diked Marshes; Description of 3 restoration sties	
	Element 4: Restoration and Mitigation; Policy 1	
	Element 4: Restoration and Mitigation; Policy 2	
	Element 5: Beaches and Dunes; Findings/Inventory; Description/definition of beach and dune landforms	
	Element 5: Beaches and Dunes; Classification System Conversion Table; Normalizes beach and dune terminology	
	Element 5: Beaches and Dunes; Findings/Inventory; Description/definition of beach and dune landforms	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; General Policy 1	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; General Policy 2	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; General Policy 3	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; General Policy 4	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; General Policy 5	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Beach Policy 1	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Beach Policy 2	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Beach Policy 3	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Foredunes Policy 1	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Foredunes Policy 2	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Active Dune Forms Policy 1	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Recently Stabilized Dune Forms Policy 1	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Recently Stabilized Dune Forms Policy 2	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Recently Stabilized Dune Forms Policy 3	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Older Stablized Dune Forms Policy 5	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Older Stablized Dune Forms Policy 6	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Interdune Forms Policy 1	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Interdune Forms Policy 2	
	Element 5: Beaches and Dunes; Beaches and Dunes Mgmt Policies; Interdune Forms Policy 3	
	Element 5: Appendix C; Definitions	
DOUGLAS COUNTY LAND USE AND DEVELOPMENT ORDINANCE	Chapter 1: Intro and General Provisions; Sections 1.010-1.090; Purpose, scope, compliance, definitions	Amendments to various provisions related to medical marijuana facilities and grow operations in 2015 and 2016. See Douglas County Orders 2015-04-01 and 2016-11-01.

2014 version approved in Program	Chapter 3: Zoning; Article 3.1; Introductory Provisions	In Dec. 2014, various provisions were amended to implement "minor clarifying amendments resulting from LCDC amendments to the OARs." See Order 2014-12-02. In 2015, various provisions were revised per legislative changes in HB 2830 and 2831, regarding procedural modifications for LUBA remands and boundary line adjustment restrictions per measure 49 waivers. See Order 2015-12-02. For more information, see detailed compilation of amendments at http://www.co.douglas.or.us/planning/Plan_docs/LUDO/ORDAMEND.pdf
	Chapter 3: Zoning; Article 3.2; Timberland Resources (TR)	
	Chapter 3: Zoning; Article 3.3; Exlusive Farm Use-Grazing (FG)	
	Chapter 3: Zoning; Article 3.4; Exlusive Farm Use-Cropland (FC)	
	Chapter 3: Zoning; Article 3.5; Farm Forest (FF)	
	Chapter 3: Zoning; Article 3.6 (Except 3.36.000-3.36.040) Agriculture and Woodlot (AW)	
	Chapter 3: Zoning; Article 3.7; Public Reserve (PR)	
	Chapter 3: Zoning; Article 3.8; Rural Residential-5 (5R)	
	Chapter 3: Zoning; Article 3.9; Rural Residential-2 (RR)	
	Chapter 3: Zoning; Article 3.10; Rural Residential-1 (1R)	
	Chapter 3: Zoning; Article 3.11; Suburban Residential (RS)	
	Chapter 3: Zoning; Article 3.12; Single Family Residential (R-1)	
	Chapter 3: Zoning; Article 3.13; Multiple Family Residential (R-2)	
	Chapter 3: Zoning; Article 3.14; Residential High Density and Prof Office (R-3)	
	Chapter 3: Zoning; Article 3.15; Limited Commercial (C-1)	
	Chapter 3: Zoning; Article 3.16; Tourist Commericial (CT)	
	Chapter 3: Zoning; Article 3.17; Community Commercial (C-3)	
	Chapter 3: Zoning; Article 3.18; General Commercial (C-3)	
	Chapter 3: Zoning; Article 3.19A; Rural Service Center Commercial (CRS)	
	Chapter 3: Zoning; Article 3.19B; Rural Community Commercial (CRC)	
	Chapter 3: Zoning; Article 3.19C; Rural Commercial (CRE)	
	Chapter 3: Zoning; Article 3.19D; Water-Oriented Tourist Commercial (WOTC)	
	Chapter 3: Zoning; Article 3.19E; Water-Oriented Commercial Recreation (WOCR)	
	Chapter 3: Zoning; Article 3.19F; Marine Commercial (MC)	
	Chapter 3: Zoning; Article 3.20; Light Industrial (M-1)	
	Chapter 3: Zoning; Article 3.21; Medium Industrial (M-2)	
	Chapter 3: Zoning; Article 3.22; Heavy Industrial (M-3)	
	Chapter 3: Zoning; Article 3.23A; Rural Community Industrial (MRC)	
	Chapter 3: Zoning; Article 3.23B; Rural Industrial (ME)	
	Chapter 3: Zoning; Article 3.23C; Marine Industrial (MRI)	
	Chapter 3: Zoning; Article 3.24; Estuarine Natural (EN)	
	Chapter 3: Zoning; Article 3.25; Estuarine Conservation (EC)	
	Chapter 3: Zoning; Article 3.26; Estuarine Development (ED)	
	Chapter 3: Zoning; Article 3.27; Conservation Shorelands	
	Chapter 3: Zoning; Article 3.28; Marine Rural (MR)	
	Chapter 3: Zoning; Article 3.29; Water Impoundment (WI)	
	Chapter 3: Zoning; Article 3.30; Floodplain Overlay (FP)	
	Chapter 3: Zoning; Article 3.32; Supplementary Provisions for Natural Resource Areas	
	Chapter 3: Zoning; Article 3.33; Beaches and Dunes Overlay (BD)	
	Chapter 3: Zoning; Article 3.34; Shorelands Overlay (SO)	
	Chapter 3: Zoning; Article 3.35; Supplemental Provisions; Section 3.35.400 Cultural, Historic and Archeological Resources Overlay (CHA)	
	Chapter 3: Zoning; Article 3.35; Supplemental Provisions; Section 3.35.500 Geologic Hazards Overlay (GH)	
	Chapter 3: Zoning; Article 3.35; Supplemental Provisions; Section 3.35.600 Potential Water Impoundment Overlay (WO)	
	Chapter 3: Zoning; Article 3.35; Supplemental Provisions; Section 3.35.700 Dredged Material Disposal and Mitigation Site Overlay (D/MO)	

	Chapter 3: Zoning; Article 3.35; Supplemental Provisions; Section 3.35.950 Exceptions Process Limited Use Overlay (EP)
	Chapter 3: Zoning; Article 3.35; Supplemental Provisions; Section 3.35.960 Tsunami Inundation Overlay (TIO)
	Chapter 3: Zoning; Article 3.36; Supplemental Provisions-Estuarine and Shoreland Areas; Section 3.36.020 Application
	Chapter 3: Zoning; Article 3.36; Supplemental Provisions-Estuarine and Shoreland Areas; Section 3.36.030 Resource capabilities test for estuarine natural and conservation mgmt units
	Chapter 3: Zoning; Article 3.36; Supplemental Provisions-Estuarine and Shoreland Areas; Section 3.36.040 Other alterations
	Chapter 3: Zoning; Article 3.36; Supplemental Provisions-Estuarine and Shoreland Areas; Section 3.36.050 Standards and criteria applicable to use and activiies in estuarine and shorelands areas
	Chapter 3: Zoning; Article 3.36; Supplemental Provisions-Estuarine and Shoreland Areas; Section 3.36.060 Standards and criteria for estuarine zones
	Chapter 3: Zoning; Article 3.36; Supplemental Provisions-Estuarine and Shoreland Areas; Section 3.36.070 Standards and criteria for shoreland zones
	Chapter 3: Zoning; Article 3.37; Non-conforming Use
	Chapter 3: Zoning; Article 3.38; Zone change
	Chapter 3: Zoning; Article 3.39; Conditional use review
	Chapter 3: Zoning; Article 3.40; Variances

Applicable Enforceable Policies

Jordan Cove Energy Project – Federal Consistency Review

State Statues

Oregon State Statute Chapter	Statute Section Title with Enforceable Policy(ies)
ORS Chapter 196 (Removal-Fill)	.800 Definitions for ORS 196.600 to 196.905 .805 Policy .810 Permit required to remove material from bed or banks of waters; status of permit; exceptions; rules .815 Application for permit; rules; fees; disposition of fees .818 Wetland delineation reports; review by Department of State Lands; fees; rules .825 Criteria for issuance of permit; conditions; consultation with public bodies; hearing; appeal .830 Estuarine resource replacement as condition for fill or removal from estuary; considerations; other permit conditions .845 Investigations and surveys .855 Noncomplying removal of material or filling as public nuisance .880 Fill under permit presumed not to affect public rights; public rights extinguished .905 Applicability; rules
ORS Chapter 274 (Submersible and Submerged Lands)	.005 Definitions .025 Jurisdiction over submersible and submerged lands generally .040 Sale or lease of submersible lands; easements; occupation of submerged and submersible lands for water works .043 Exemptions from leasing requirements; rules; registration; use without charge; use with charge; indemnification .060 Regulation of harbor improvements; oyster beds; public easement in submerged and submersible lands .400 Beds of Streams, Lakes, Bays; Definition for ORS 274.400 to 274.412 .402 Exclusive jurisdiction to assert title to submerged or submersible lands in navigable waterway .550 Removal of material without payment of royalties; eligible material and uses

	.705 Tidal Submersible and Submerged; Definitions for ORS 274.705 to 274.860 .710 Jurisdiction of department over tidal submerged lands; easements; leases for oil, gas and sulfur .860 Protection and location of filled lands .905 Submersible, submerged and new lands; Definitions for ORS 274.905 to 274.940 .920 Creation of new lands upon submersible or submerged lands .940 Reservation of historically filled lands or new lands
ORS Chapter 390 (Parks and Recreation; Ocean Shores)	.010 Policy of state toward outdoor recreation resources .235 Archeological Sites and Historic Material; Permits and conditions for excavation or removal of archaeological or historical material; rules; criminal penalty .237 Removal without permit; exceptions
ORS Chapter 454 (Sewage and Disposal Systems)	.605 Definitions for ORS 454.605 to 454.755 .607 Policy .610 Regulation of gray water discharge; permit; rules .655 Permit required for construction; application; time limit; special application procedure for septic tank installation on parcel of 10 acres or more .657 Variance from subsurface sewage disposal system rules or standards; conditions; hearing
ORS Chapter 468 (Environmental Quality Generally)	.936 Unlawful air pollution in the second degree .939 Unlawful air pollution in the first degree .941 Determination of number of punishable offenses under ORS 468.936 and 468.939 .943 Unlawful water pollution in the second degree .946 Unlawful water pollution in the first degree .949 Determination of number of punishable offenses under ORS 468.943 and 468.946 .951 Environmental endangerment
ORS Chapter 468A (Air Quality)	468A.005 Definitions for air pollution laws 468A.010 Policy 468A.020 Application of air pollution laws

	468A.025 Air purity standards; air quality standards; treatment and control of emissions; rules 468A.040 Permits; rules 468A.045 Activities prohibited without permit; limit on activities with permit 468A.050 Classification of air contamination sources; registration and reporting of sources; rules; fees 468A.055 Notice prior to construction of new sources; order authorizing or prohibiting construction; effect of no order; appeal 468A.060 Duty to comply with laws, rules and standards 468A.070 Measurement and testing of contamination sources; rules 468A.075 Variances from air contamination rules and standards; delegation to local governments; notices
ORS Chapter 468B (Water Quality)	468B.005 Definitions for water pollution control laws 468B.015 Policy 468B.020 Prevention of pollution 468B.025 Prohibited activities 468B.048 Rules for standards of quality and purity; factors to be considered; meeting standards 468B.050 Water quality permit; issuance by rule or order; rules 468B.052 Fees for water quality permit to operate suction dredge 468B.055 Plans and specifications for disposal, treatment and sewerage systems 468B.060 Liability for damage to fish or wildlife or habitat; agency to which damages payable 468B.120 Definitions for 468B.120 to 468B.135 468B.125 Policy to reduce phosphorous pollution 468B.130 Prohibition on sale or distribution of cleaning agents containing phosphorous; rules 468B.135 Exemptions 468B.150 Definitions for 468B.150 to 468B.190 468B.155 State goal to prevent ground water contamination 468B.160 Ground water management and use policy

	468B.300 Definitions for 468B.300 to 468B.500 468B.305 Entry of oil into waters of state prohibited; exceptions 468B.310 Liability for violation of 468B.305; exceptions 468B.315 Duty to collect and remove oil; dispersal of oil 468B.320 Action by state; liability for state expense; order; appeal 468B.337 Liquefied natural gas 468B.345 Oil spill contingency plan required to operate facility or covered vessel in state or state waters; exceptions 468B.350 Standards for contingency plans; oil spill response zones; rules 468B.355 Contingency plans; participation in maritime association; lien; liability of maritime association; exemption from liability 468B.360 Review of contingency plan 468B.365 Plan approval; change affecting plan; certificate of approval 468B.370 Determination of adequacy of plan; practice drills; rules 468B.375 Inspection of facilities and vessels; coordination with State of Washington 468B.380 Tank vessel inspection program; rules 468B.385 Modification of approval of contingency plan; revocation of approval; violation 468B.390 Compliance with federal Oil Pollution Act of 1990; proof of financial responsibility 468B.450 Willful or negligent discharge of oil; civil penalty; authority of director to mitigate 468B.460 Rules 468B.475 Legislative finding; need for evidence of financial assurance for ships transporting oil 468B.485 Methods of establishing financial assurance
ORS Chapter 469 (Energy)	.300 Definitions .310 Policy .320 Siting certificate required; exceptions .500 (currently numbered 469.507. Following are EPs: .507(1), .507(2), .507(3), .507(4))

	.510 (currently numbered 469.501 and 469.504. Following are EPs: .501e, .501g, .501i, .501k, .501m, and 469.504)
ORS Chapter 496 (Wildlife Administration)	.004 Definitions .007 “Game bird” defined .009 “Game fish” defined .012 Wildlife policy .162 Establishing seasons, amounts and manner of taking wildlife; rules .171 Th or E Wildlife Species. Definitions for ORS 496.171 to 496.182; applicability date .182 Protection and conservation programs; mitigation of adverse impact on local economies; compliance by state agencies; rules
ORS Chapter 498 (Fish Screening)	.301 Policy .306 Screening or by-pass devices for water diversions; fees; costs .316 Exemption from screening or by-pass devices
ORS Chapter 506 (Commercial Fishing and Fisheries)	.006 General definitions .011 Types of marine life defined .016 “Salmon” defined .025 “Unlawful to buy” defined .028 “Conservation” defined .109 Food fish management policy .220 Erecting markers of closed waters; interference with markers .450 Definitions for ORS 506.450 to 506.465; rules .455 Policy .610 When possession prima facie evidence of taking fish unlawfully
ORS Chapter 509 (Additional Fishery Requirements)	.001 Definitions .112 Wasting food fish .115 Placing in waters fish harmful to food fish .120 Using electricity to disturb food fish .122Definitions for ORS 509.125 to 509.155 .125 Placing substances in water to drive fish from closed areas .130 Placing substances in water or using explosives to take or destroy food fish

	.140 Placing explosives or harmful substances in waters in course of lawful work; permit .505 Placing in water matter injurious to shellfish .510 Taking shellfish from marked beds without permission; disturbing beds .580 Definitions for ORS 509.580 to 509.590, 509.600 to 509.645 and 509.910; rules .585 Fish passage required for artificial obstructions; statewide inventory; waiver of requirement by commission; rules; exemptions .600 Destroying, injuring or taking fish near fishway; permits to take fish .610 Maintenance of fish passage required .625 Power of department to inspect artificial obstructions and have fish passage constructed or remove obstruction
ORS Chapter 536 (Water Resources Administration)	.220 Policy on water resources generally; integrated state water resources strategy .700 Drainage basin" defined .710 Policy
ORS Chapter 537 (Water Appropriation)	.010 Definition of "Water Rights Act." .110 Public ownership of waters. .120 Right of appropriation; vested rights protected. .130 Permit to appropriate water required; notification to owner of certain land .135 Permit required to appropriate water for recharging ground water sources; minimum perennial streamflow required for permit; exception. .140 Application for permit; contents; maps and drawings. .150 Filing of application; determination of completeness; initial review; preliminary determination; notice; public comments; fees. .160 Approval for beneficial use; agreement authorizing use of ditch for waste or seepage water. .170 Contested case hearing on application; final order; appeal. .240 Federal permit; time for obtaining; cancellation; time for beginning and completing work. .400 Reservoir permits.

	.410 Failure to commence or complete work, or to properly apply water, as grounds for cancellation of permit; irrigation districts, municipalities and public utilities excepted. .420 Notice of hearing. .440 Cancellation of permit; priorities of other permits. .445 Hearing upon proposal to cancel permit or appropriation; cancellation suspended pending review. .450 Rules for proof as to work and use of water under permits; noncompliance as evidence in cancellation proceedings. .505 Short title. .515 Definitions for ORS 537.505 to 537.795 and 537.992. .525 Policy. .535 Unlawful use or appropriation of ground water, including well construction and operation. .545 Exempt uses; map; filing of use; fee; rules. .575 Permits granted, approved or pending under former law. .585 Beneficial use of ground water prior to August 3, 1955, recognized as right to appropriate water when registered. .595 Construction or alteration of well commenced prior to August 3, 1955, recognized as right to appropriate water when registered. .605 Registration of right to appropriate ground water claimed under ORS 537.585 or 537.595; registration statement. .610 Recording registration statement; issuing certificate of registration; effect of certificate; rules; fees. .615 Application for permit to acquire new right or enlarge existing right to appropriate ground water; plans and drawings. .620 Determination of completeness of application; initial review; preliminary determination; notice; public comments .625 Final order; appeal; contents of permit. .630 Time allowed for construction work under permit; extension; certificate of completion; survey; ground water right certificate; requirements for supplemental water right. .635 Assignment of application, certificate of registration or permit .680 Taking testimony; inspecting evidence; contesting claim. .685 Findings of fact and order of determination.

	.690 Filing evidence, findings and determinations; court proceedings. .695 Conclusive adjudication. .705 Ground water appurtenant; change in use, place of use or point of appropriation. .730 Designation of critical ground water area; rules; notice .780 Powers of Water Resources Commission; rules; limitations on authority. .795 ORS 537.505 to 537.795 supplementary.
ORS Chapter 564 (Threatened of Endangered Plants)	.100 Definitions for ORS 564.100 to 564.135 .115 Protection and conservation programs; action by state agencies; alternatives; findings required if agency fails to adopt alternatives .120 Transactions in threatened or endangered species; restrictions; prohibition

Statewide Land Use Planning Goals

Statewide land Use Planning Goal Number	Page and Description with Enforceable Policy(ies)
Goal 2	Pg 2. Part II- Exceptions
Goal 6	Pg 1. First paragraph (unbolded)
Goal 16	Pg 1. Column 2: Introduction: Protection for estuarine ecosystems and priorities listed for management and use of estuarine resources. Pg 2. Column 1 thru Pg 4 Column 2: Management Units: Estuary resources maintained through three management units; definition of units and list of specific uses allowed in each unit. Pg 4 Column 2: Implementation Requirements, #1: Impacts assessment needed for actions that could alter the estuarine ecosystem and contents of assessment described. Pg 5 Column 1: Implementation Requirements, #2: Limitations on dredging/filling Pg 6 Column 1: Implementation Requirements, #5: Mitigation required when dredge/fill is permitted in intertidal or tidal marsh areas. Pg 6 Column 1: Implementation Requirements, #6: Prohibition on dredge material disposal in intertidal or tidal marsh areas

	Pg 6 Column 1: Implementation Requirements, #7: Limitions on size and shape of over water-structures and alternatives to over-water structures must be considered.
Goal 17	Pg. 2 Column 2 thru Pg. 3 Column 1: Identification of Coastal Shorelands; definition of coastal shorelands. Pg. 3 Column 1: Coastal shoreland Uses: Protection for significant areas and allowed uses. Pg. 3 Column 1 to Column 2: Location of shorelands: Protection for water-dependent uses in certain areas of shorelands. Pg. 3 Column 2 to Pg. 4 Column 1: Permissible Nonwater-Dependent Uses; definition of permissible nonwater-dependent uses. Pg. 4 Column 2: Implementation Requirements: #3: Dredged material disposal site protection from new uses Pg. 4 Column 2 to Pg. 5 Column 1: Implementation Requirements: #4: Riparian vegetation shall be maintained and where appropriate restored and enhanced. Pg. 5 Column 1: Implementation Requirements: #5: Practices and non-structural solutions will be preferred to structural solutions. Pg. 5 Column 1: Implementation Requirements: #6: Existing public ownership maintained. Pg 7 Column 1: Examples of Incidental Uses: Definitions of conjunction and incidental to water-dependent use; clarifies permissible nonwater-dependent use definition.

Coos County

Local Plan or Ordinance	Section Title & Description with Enforceable Policy(ies)
Coos County Comprehensive Plan Volume I, Part 1, Section 5: Plan Provisions (2013)	Section 5.2, Strategies 2, 14 Plan policies regarding Land Use & Community Development Section 5.3, Strategies 1, 10, 12, 13 Plan policies regarding Agricultural Lands Section 5.4, Strategies 1, 3, 9 Plan policies regarding Forest Lands Section 5.5, Strategies 1, 2, 4 Plan policies regarding Mineral and Aggregate Resources

	Section 5.6, Strategies 1, 6 Plan policies regarding Fish and Wildlife Habitats Section 5.7, Strategy 3 Plan policies regarding Historical & Archaeological Resources, Natural Areas, etc. Section 5.10, Strategies 1, 2, 3, 5, 7, 8, 9, 10, 11 Plan policies regarding Dunes, and Ocean and Coastal Lake Shorelands Section 5.11 Strategies 1, 4, 6, 7 Plan policies regarding Natural Hazards Section 5.18 Strategies 4, 4a, 5, 6 Plan policies regarding Public Facilities Section 5.22, Strategy 2 Plan policies regarding Urbanization
Coos County Comprehensive Plan Volume II, Part 1, Sections 3 and 5: Coos Bay Estuary Management Plan (2013)	Section 3.3 Policy 4, including 4a Resource Capability Consistency and Impact Assessment Section 3.3 Policy 5, including 5a-5d Estuarine Fill and Removal Section 3.3 Policy 8 Estuarine Mitigation Requirements Section 3.3 Policy 9 Solutions to Erosion and Flooding Problems Section 3.3 Policy 14 General Policy on Uses within Rural Coastal Shorelands Section 3.3 Policy 16, including 16a and 16b Protection of Sites Suitable for Water-Dependent Uses and Special Allowance for new Non-Water- Dependent Uses in “Urban Water-Dependent (UW) Units" Section 3.3 Policy 18 Protection of Historical, Cultural and Archaeological Sites Section 3.3 Policy 19 Management of "Wet-Meadow" Wetlands within Coastal Shorelands Section 3.3 Policy 20, including 20b and 20c Dredged Material Disposal Sites Section 3.3 Policy 22, including 22b Mitigation Sites: Protection Against Pre-emptory Uses Section 3.3 Policy 30 Restricting Actions in Beach and Dune Areas with "Limited Development Suitability" and Special Consideration for Sensitive Beach and Dune Resources Section 5 ALL Management Units
Coos County Zoning and Land	Chapter 2; Sections 2.1.100 – 2.1.200 (exception: OCRM does not approve “Continental Shelf”) Definitions

Development Ordinance Chapters 1-3 (2013)	Chapter 3; Section 3.2.500 Right of way enhancement Chapter 3; Section 3.2.700 Process for tribal review at archeological sites
Coos County Zoning and Land Development Ordinance Chapter 4 (2013)	Section 4.1.100 Part A; Establishes zoning districts and purposes for 16 zones Section 4.1.100 Part B; Establishes overlay zones Section 4.1.100 Part C; Establishes shoreland zones for Coquille River estuary Section 4.1.100 Part D; Establishes aquatic unit zones for Coquille River estuary Section 4.2.100; Use Matrices – General Section 4.2.400; Rural Residential and Rural Unincorporated Table 4.2.c Section 4.2.500; Urban Residential Zoning District: Table 4.2.d Section 4.2.600; Commercial – Industrial Zoning District: Table 4.2.e Section 4.2.900; Review Standards and Conditions (refers to tables) Section 4.4.400; General Standards for Rural Residential Zoning Districts Section 4.4.600; Commercial – Industrial Districts Table 4.5.100; Purpose: Land Development Standards Section 4.5.175; Site-Specific Zoning Districts Section 4.5.180.2; Riparian protection standards re existing structures Section 4.5.201; Management Objective DDNC-DA Section 4.5.202; Uses, Activities, Special Conditions Table DDNCDA Section 4.5.240; Management Objectives for 3-WD Section 4.5.241; Uses, Activities, Special Conditions Table 3-WD Section 4.5.245; Management Objectives for 3W-NS Section 4.5.246; Uses, Activities, Special Conditions Table 3W-NS Section 4.5.255; Management Objectives for 4-CS Section 4.5.256; Uses, Activities, Special Conditions Table 4-CS Section 4.5.260; Management Objectives for 5-WD Section 4.5.261; Uses, Activities, Special Conditions Table 5-WD

	Section 4.5.265; Management Objectives for 5A-NS Section 4.5.266; Uses, Activities, Special Conditions Table 5A-NS Section 4.5.275; Management Objectives for 6-WD Section 4.5.276; Uses, Activities, Special Conditions Table 6-WD Section 4.5.280; Management Objectives for 6-DA Section 4.5.281; Uses, Activities, Special Conditions Table 6-DA Section 4.5.285; Management Objectives 7-D Section 4.5.286; Uses, Activities, Special Conditions 7-D Section 4.5.290; Management Objectives 7-NA Section 4.5.291; Uses, Activities, Special Conditions Table 7-NA Section 4.5.335; Management Objectives for ; 58-NA Section 4.5.336; Uses, Activities, Special Conditions Table ; 58-NA Section 4.5.370; Management Objectives for 8-WD Section 4.5.371; Uses, Activities, Special Conditions Table 8-WD Section 4.5.375; Management Objectives for 8-CA Section 4.5.376; Uses, Activities, Special Conditions Table 8-CA Section 4.5.400; Management Objectives 11-RS Section 4.5.401; Uses, Activities, Special Conditions Table 11-RS Section 4.5.402; Land Development Standards Table 4.5 Section 4.5.405; Management Objectives 11-NA Section 4.5.406; Uses, Activities, Special Conditions Table 11-NA Section 4.5.425; Management Objectives 13-NA Section 4.5.426; Uses, Activities, Special Conditions Table 13-NA Section 4.5.440; Management Objectives 14-WD Section 4.5.441; Uses, Activities, Special Conditions Table 14-WD Section 4.5.445; Management Objectives 14-DA Section 4.5.446; Uses, Activities, Special Conditions Table 14-DA Section 4.5.450; Management Objectives 15-RS Section 4.5.451; Uses, Activities, Special Conditions Table 15-RS Section 4.5.455; Management Objectives 15-NA Section 4.5.456; Uses, Activities, Special Conditions Table 15-NA

	Section 4.5.480; Management Objectives 18-RS Section 4.5.481; Uses, Activities, Special Conditions Table 18-RS Section 4.5.525; Management Objectives 45A-CA Section 4.5.526; Uses, Activities, Special Conditions Table 45A-CA Section 4.5.535; Management Objectives 19-D Section 4.5.536; Uses, Activities, Special Conditions Table 19-D Section 4.5.540; Management Objectives 19B-DA Section 4.5.541; Uses, Activities, Special Conditions Table 19B-DA Section 4.5.545; Management Objectives 20-RS Section 4.5.546; Uses, Activities, Special Conditions Table 20-RS Section 4.5.550; Management Objectives 20-CA Section 4.5.551; Uses, Activities, Special Conditions Table 20-CA Section 4.6.205; Designation of Flood Areas Section 4.6.210; Permitted Uses Section 4.6.215; Conditional Uses Section 4.6.230; Procedural Requirements for Development within Special Flood Hazard Areas Section 4.6.235; Sites within Special Flood Hazard Areas Section 4.7.105; Prescribed Regulations TABLE 4.7a; Special Regulatory Considerations Prescribed By The Coos County Comprehensive Plan Section 4.8.200; Uses Permitted Section 4.8.300; Administrative Conditional Use Section 4.8.400; Review Criteria for Conditional Use Section 4.8.600; Mandatory Siting Standards Required for Dwellings and Structures in the Forest Zone Section 4.8.700; Fire Siting and Safety Standards Section 4.8.750; Development Standards Section 4.9.200; Uses Permitted Outright Section 4.9.300; Administrative Conditional Use Section 4.9.400; Review Criteria for Conditional Use

	Section 4.9.450; Additional Hearings Body Conditional Uses and Review Criteria Section 4.9.600; Siting Standards for Dwellings and Structures in EFU Zone Section 4.9.700; Development Standards

Douglas County

Local Plan or Ordinance	Section Title & Description with Enforceable Policy(ies)
Douglas County Comprehensive Plan (2015)	Rural Land Use Policies; Rural Resource Designations; Criteria for designating rural resource lands Rural Land Use Policies; Overlay Zones; Table specifies overlay zone designations and relationship to plan policies for twenty overlay zones
Douglas County Land Use and Development Ordinance (2014)	Chapter 1: Intro and General Provisions; Sections 1.010-1.090; Purpose, scope, compliance, definitions Chapter 3: Zoning; Article 3.1; Introductory Provisions Chapter 3: Zoning; Article 3.2; Timberland Resources (TR) Chapter 3: Zoning; Article 3.3; Exlusive Farm Use-Grazing (FG) Chapter 3: Zoning; Article 3.5; Farm Forest (FF) Chapter 3: Zoning; Article 3.6 (Except 3.36.000-3.36.040) Agriculture and Woodlot (AW) Chapter 3: Zoning; Article 3.32; Supplementary Provisions for Natural Resource Areas Chapter 3: Zoning; Article 3.39; Conditional use review

City of Coos Bay

Local Plan or Ordinance	Section Title & Description with Enforceable Policy(ies)
City Coos Bay Comprehensive Plan Chapter 7 (2013)	"Section 7.10, ER.1 Estuarine Resources (adoption of Coos Bay Estuary Management Plan provisions)"

City Coos Bay Land Dev. Ordinance Title 17 Division 5 (2013)	Chapter 17.340, 17.340.010 – 17.340.080 Estuarine and Coastal Shorelands Uses and Activity
Coos Bay Estuary Management Plan Part 1, Section 5 (2013)	Lower Bay/Upper Bay DA All requirements, Aquatic Unit/Deep-Draft Navigation Channel 52-NA All requirements Natural Aquatic 54-DA All requirements Development Aquatic 55-CA All requirements Conservation Aquatic

City of North Bend

Local Plan or Ordinance	Section Title & Description with Enforceable Policy(ies)
Zoning Ordinance 1192 (2013)	Sections 59 - 61, Heavy Industrial District M-H Sections 64 - 69, Floodplain Zone F-P
Coos Bay Estuary Management Plan Estuary management Units within City of North Bend Limits (2013)	47-DA All requirements, Development Aquatic 47-UW All requirements, Urban Waterfront 48-CA All requirements, Conservation Aquatic 48-CS All requirements, Conservation Shoreland 50-NA All requirements, Natural Aquatic 51-CA All requirements, Conservation Aquatic

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DEPARTMENT OF JUSTICE
GENERAL COUNSEL DIVISION

August 15, 2017

Kinberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, D.C. 50426

Re: Oregon State Agency Scoping Comments on FERC's Notice of Intent to Prepare an Environmental Impact Statement for Docket No. PF 17-4-000 (Jordan Cove Energy Project LP and Pacific Connector Gas Pipeline LP)
DOJ File No.: 0ES456-ES456

Dear Ms. Bose:

The Oregon Department of Justice submits comments on behalf of the following agencies of the State of Oregon: Oregon Department of Environmental Quality, Oregon Department of Land Conservation and Development, Oregon Department of Geology and Mineral Industries, the Oregon Parks and Recreation Department's State Historic Preservation Office, the Oregon Department of Energy, the Oregon Department of Fish and Wildlife, the Oregon Water Resources Department, the Oregon Department of Transportation, and the Oregon Department of Aviation. Each agency's comments are identified by a separate header.

Oregon Department of Environmental Quality

On June 9, 2017, the Federal Energy Regulatory Commission (FERC) issued a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the Jordan Cove Terminal and Pacific Connector Pipeline projects. The Oregon Department of Environmental Quality (DEQ) offers the following comments on the NOI. DEQ also submits a list of permits that might be needed for the project based on the applicants pre-filing notices. See Attachment A for the list of possible permits.

The NOI identifies five environmental issues that FERC plans to evaluate in more detail in the draft EIS (see NOI, Pages 7 - 8). DEQ's major concerns from the previous evaluation of the export project include the following:

- Impacts to the Coos Bay estuary from the construction of the liquid natural gas export facility and pipeline, and widening of the navigational channel;

- Management and placement of about 7 million cubic yard of dredge material from the marine slip and navigational channel;

- Impacts to groundwater on the North Spit from dewatering activities of dredge material, and the use of billions of gallons of fresh water during construction and operations;

- Thermal loading to streams and tributaries associated with removal of vegetation during construction and maintenance of the pipeline;
- Sedimentation and turbidity impacts to streams due to erosive events caused by vegetation removal and pipeline construction;

- Slope failures and/or mass wasting events triggered by pipeline construction;

- Impact to key water bodies from inadvertent return of drilling lubricant during horizontal directional drilling;

- Post construction stormwater management plans to prevent water quality impacts;

- To mitigate for loss of wetland habitat during construction, Jordan Cove Energy Project proposes to conduct wetland mitigation at the Kentuck Slough, West Bridge, and West Jordan Cove wetland sites. Mitigation is a connected action and must be included in the scope of analysis; and

- The draft Environmental Impact Statement should provide detailed description of the environmental impacts on federal, state and private lands.

DEQ worked with the applicant to analyze these issues related to the previous export project, and would like to see the analysis updated to reflect changes associated with the modified export project.

Thank you for the opportunity to comment. If you have questions, please contact me at 541-687-7435 or via e-mail at camarata.mary@deq.state.or.us.

DEQ Permits

Permit	**Authority**		**LNG**	**Pipeline**
AIR QUALITY				
Title V Operating Permit Oregon DEQ Air Quality Division administers the Title V Air Permit program under federally delegated authority. Oregon DEQ expects the permit to regulate emissions from the LNG facilities and the pipeline compressor station. The applicant must	Federal: State:	Clean Air Act, Title V (42 USC §7661) ORS 468A (Air Quality) OAR Chapter 340, Division 218 - Oregon Title V Operating Permit	X	X

Permit	Authority		LNG	Pipeline
first obtain an Air Contaminant Discharge Permit (ACDP) from Oregon DEQ prior to construction and operation of the LNG facilities and pipeline compressor station.				
Air Contaminant Discharge Permit (ACDP) ACDPs are state-issued permits regulating the discharge of criteria and hazardous air pollutants. Oregon DEQ requires an ACDP for any new major discharge sources which require a Title V Air Permit. Discharges of criteria and hazardous air pollutants are regulated under the ACDP until issuance of the Title V Air Permit. This applies to the LNG facilities and the pipeline compressor station.	Federal: State:	NA ORS 468A - Air Quality OAR Chapter 340, Division 216 – Air Contaminant Discharge Permits OAR Chapter 340, Division 222 – Stationary Plant Site Emission Limits	X	X
Greenhouse Gas Reporting Requirements Certain facilities that hold ACDP or Title V operating permit with Oregon are required to report greenhouse gas emissions to DEQ pursuant to OAR Chapter 340 Division 215.	Federal: State:	40 CFR. Part 98 ORS 468A -Air Quality OAR Chapter 340, Division 215 – Greenhouse Gas Reporting	X	X
Prevention of Significant Deterioration (PSD) Prevention of Significant Deterioration (PSD) applies to new major sources or major modifications at existing sources for pollutants where the area the source is located is in attainment. PSD requires implementation of Best Available Control Technology (BACT) to minimize new discharges. Applicant must also complete an air quality analysis to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and PSD increments.	Federal: State:	Clean Air Act (42 USC §7401) ORS 468A (Air Quality) OAR Chapter 340, Division 224 – Major New Source Review OAR Chapter 340, Division 225 – Air Quality Analysis Requirements	X	
WATER QUALITY				
NPDES 1200-C Construction Stormwater Permit National Pollution Discharge Elimination System (NPDES) Permit 1200-C is a federal general permit administered by Oregon DEQ. NPDES	Federal: State:	Section 402 of the Clean Water Act (33 USC §1251) ORS 468B – Water Quality OAR Chapter 340, Division	X	X

Permit	Authority		LNG	Pipeline
1200-C permits regulate the discharge of stormwater from sites greater than one-acre during temporary construction activities.		45 – Regulations Pertaining to NPDES Permits		
<u>Clean Water Act Section 404/401 Removal/Fill Permit</u> Section 401 of the Clean Water Act (CWA) provides states with a mechanism to ensure that actions which result in a discharge to waters of the state and which require a federal permit or license will comply with state water quality standards. CWA Section 401 authorizes the states to condition the permit or license in a manner deemed necessary to achieve water quality compliance. CWA Section 401 further allows states to deny actions which they believe will not meet applicable water quality standards. The applicant will require a CWA water quality certification from Oregon DEQ in conjunction with the Section 404 permit issued by the Army Corps of Engineers for the removal and placement of material in waters of the state.	Federal: State:	Section 401 of the Clean Water Act (33 USC §1341 & 1344) ORS 468B – Water Quality OAR Chapter 340, Division 48 – Water Quality Certifications	X	X
<u>Water Pollution Control Facility (WPCF) Permit</u> Oregon WPCF permits are required for disposal systems that dispose of domestic wastewater onto or beneath the ground surface and with no direct discharge to surface waters. Domestic wastes from on-site septic system discharges will be regulated under an individual WPCF Permit. The applicant may need this permit if they plan to use an onsite system for the LNG facility. The applicant may need a WPCF permit to dispose of water used to perform hydrostatic testing on tanks and pipes. The applicant should contact Oregon DEQ to discuss disposal options.	Federal: State:	NA ORS 468B – Water Quality OAR Chapter 340, Division 045 – Regulations Pertaining to NPDES and WPCF Permits; Division 052 – Review Plans and Specifications; Division 071 – Onsite Systems	X	X

Permit	Authority		LNG	Pipeline
Current Permits				
National Pollutant Discharge Elimination System (NPDES) National Pollution Discharge Elimination System (NPDES) wastewater permit is a federal permit administered by Oregon DEQ. NPDES wastewater permits regulate the discharge of industrial wastewater into the waters of the United States. The applicant may need to modify their existing permit, if the applicant wants to include other wastewater streams from the LNG facility.	Federal: State:	Section 402 of the Clean Water Act (33 USC §1251) ORS 468B – Water Quality OAR Chapter 340, Division 45 – Regulations Pertaining to NPDES Permits	X	
Solid Waste Permit Solid Waste Permit is a federal permit administered by Oregon DEQ. A Solid Waste Permit manages the disposal of material waste arising from industrial activities that are discarded as unwanted and useless. The applicant may need to close their permitted landfills on the LNG site.	Federal: State:	Title 40 of the CFR parts 239 through 259 ORS 459 – Solid Waste Management OAR Chapter 340, Division 95 – Solid Waste: Land Disposal Sites Other Than Municipal Landfills	X	

Oregon Department of Land Conservation and Development

The federal Coastal Zone Management Act (CZMA) of 1972, as amended, requires that activities authorized by certain specified federal licenses and permits, and that affect any use or resource of a state's coastal zone, must be conducted in a manner consistent with the enforceable policies of that state's federally-approved coastal management program. This process is known as "federal consistency." The federally-approved Oregon Coastal Management Program (OCMP) specifies that activities authorized by licenses for construction and operation of natural gas import or export facilities, and permits and licenses required for interstate pipelines, are subject to federal consistency. The proposed liquefaction project and portions of the proposed pipeline occur within the boundaries of Oregon's coastal zone, will be authorized by specified federal licenses or permits, and will affect coastal uses and resources. Therefore, Oregon's lead agency for the OCMP, the Oregon Department of Land Conservation and Development (DLCD), will be reviewing the proposed projects under the federal consistency provisions of the CZMA. The applicable governing regulations are available at 15 CFR § 930, Subpart D.

DLCD's review will determine whether the proposed projects are consistent with the OCMP. Because the OCMP is a "networked" program that integrates authorities of local governments and other state agencies, the proposed projects must comply with enforceable policies contained within: 1) Oregon's statewide land use planning goals; 2) the applicable acknowledged city or county comprehensive plan and land use regulations; and 3) selected state authorities (e.g. those governing removal-fill, water quality, and fish & wildlife protections).

To begin the consistency review process, an applicant must do the following:

- Submit a certification to the federal permitting or licensing agencies (FERC and USACE) and to DLCD certifying that the proposed project complies with and will be conducted in a manner consistent with the OCMP.

- Provide DLCD with data and information that is necessary for a full project review including information on the proposed project's coastal effects. Applicants may rely on National Environmental Policy Act (NEPA) documents to provide some of the necessary data and information. In order to do so, however, the documents must contain a thorough and scientifically sound analysis of coastal effects.

- Submit an analysis of the enforceable policies within the OCMP and how the project is consistent with the policies. Enforceable policies of the OCMP are here: http://www.oregon.gov/LCD/OCMP/Pages/OCMP_Enforceable-Policies.aspx. Both local and state policies are listed.

DLCD's federal consistency review provides an important opportunity for coordination between the state, the applicant, and the Commission. The CZMA's implementing regulations note that during the review period, federal agencies and applicants should cooperate with state agencies to develop conditions that, if the applicant agrees to during the review period and the

federal agency includes in its decision, would allow the state to concur that the proposed project is consistent with the state management program.[1] Similarly, a state may issue a conditional concurrence whereby the state and the applicant, in consultation with the federal permitting agency or agencies, agree on conditions to be included in the state concurrence letter.[2] Recognizing that this important coordinating mechanism would be undermined by a premature federal authorization, the CZMA mandates that:

No license or permit shall be granted by the Federal agency until the state or its designated agency has concurred with the applicant's certification or until, by the state's failure to act, the concurrence is conclusively presumed, unless the Secretary, on his own initiative or upon appeal by the applicant, finds, after providing a reasonable opportunity for detailed comments from the Federal agency involved and from the state, that the activity is consistent with the objectives of this chapter or is otherwise necessary in the interest of national security.[3]

In any discussion of required state authorizations, DLCD expects the EIS to correctly note the above statutory requirement that the Commission may not grant a license or permit until DLCD has concurred with the applicant's certification.

Additionally, per state rule OAR 660-035-0050, DLCD is unable to provide concurrence until state permits, licenses, and authorizations associated with the enforceable policies of the Program are obtained by the applicant. Examples include, but are not limited to removal-fill permits, air and water quality permits, fish passage approvals, mitigation related to state habitat mitigation policies, water blasting permits, scientific take permits, and water use permits.

DLCD looks forward to reviewing a robust and comprehensive draft EIS. For further information or questions regarding the federal consistency review process, please contact me at 503.934.0029 or by e-mail at: *elizabeth.j.ruther@state.or.us*.

[1] 15 CFR § 930.4(a)
[2] 15 CFR § 930.62(d)
[3] 16 USC § 1456 (c)(3)(A)

Department of Geology and Mineral Industries

We received a copy of the Notice of Intent (NOI), dated June 9, 2017, to prepare an Environmental Impact Statement for the planned Jordan Cove LNG Terminal and Pacific Connector Pipeline Projects in Coos Bay, Oregon. The Department of Geology and Mineral Industries (DOGAMI) requires DOGAMI Operating Permits for excavations exceeding 5,000 cubic yards per year or over 5 acres. In addition, DOGAMI is primarily focused on public safety and health considerations related to geologic hazards. DOGAMI tsunami regulatory maps are the official State maps for implementation of **Oregon Revised Statutes (ORS)** 455.446 **and** 455.447, limiting, through the Oregon Building Code, construction of certain critical and essential facilities in the tsunami inundation zone.

The NOI states, under "Currently Identified Environmental Issues" that "preliminary issues include" "potential impacts on the LNG Terminal resulting from an earthquake or tsunami". DOGAMI observes that geologic hazard evaluations and proper mitigation of hazards are needed. We offer the following additional observations. Specifically, the applicant should provide a thorough geological characterization of the project area and surrounding area and a comprehensive site-specific geologic hazard and geotechnical assessment (including seismic, tsunami, liquefaction, cyclic strain, lateral spreading, subsidence, seiches, coastal and riverine erosion, surface fault rupture, landslide, volcano, flood, and channel migration hazards) at the proposed facility and along the pipeline with supporting evidence to explain that the facility can be appropriately constructed and operated throughout its existence. This is particularly true given the generally high seismic and seismic induced hazards at the facility and the generally high landslide hazards along the pipeline route.

New science (for example papers published about the Japan 2011 earthquake and tsunami and 2011 Christchurch New Zealand earthquakes) and hazard maps (for example landslide and tsunami maps for Coos County, Oregon) have been published. Although the NOI does not recognize this, we recommend the new science should be included as part of the new environmental impact statement.

Please call or email Yumei Wang if you have questions (yumei.wang@oregon.gov; 971-673-1551).

Oregon Parks and Recreation Department: State Historic Preservation Office

Thank you for the opportunity to comment on the Notice of Intent for the Jordan Cove FERC undertaking. At this time, our office would only wish to remind your agency of its National Historic Preservation Act (NHPA) responsibilities, specifically section 106 (and its implementing regulations 36CFR800) and section 110. For state agencies that are permitting, funding, or conducting work outside the NHPA process, in addition to federal agencies, we would like to further remind you of each of the applicable Oregon statutes that relate to archaeological sites, objects, and Native American human remains. The specific statutes are: ORS 358.905-961 and ORS 97.740-760, respectively. The archaeological permit statute is ORS 390.235.

At this time we would also like to remind FERC of their trust relationship with federally recognized tribes and their responsibility to initiate meaningful Government-to-Government consultation early and often.

Please feel free to contact our office if you have any questions or comments. John Pouley, M.A., RPA (john.pouley@oregon.gov 503-986-0675)

Oregon Department of Energy

The Oregon Department of Energy expects FERC and the applicant to meet Oregon siting standards found in Oregon Revised Statute and Administrative Rules. These include Oregon's CO2 emissions standards, the provision of a legally enforceable retirement bond for the project, and a comprehensive discussion of, and preparation for, emergency situations that could endanger humans and the environment from construction and operation activities.

Contact: Sean Mole
Sean.mole@oregon.gov
503-934-4005

Oregon Department of Fish and Wildlife

Contact: Sarah Reif
sarah.j.reif@state.or.us
503-947-6082

Note: *These comments are a compilation of Oregon Department of Fish and Wildlife (ODFW) comments to the Federal Energy Regulatory Commission (FERC) over the 11-year history of the Jordan Cove Pacific Connector (JCEP/PCGP) Notices of Intent (NOI; 2008, 2012, 2017) and Draft Environmental Impact Statements (DEIS). Many previous ODFW comments on the JCEP/PCGF Project remain relevant because despite modest changes to project configuration in the 2017 NOI, ODFW expects the impacts to fish and wildlife resources to remain largely the same. ODFW hopes that provision of this detailed input early in the process will prove useful to FERC and to JCEP/PCGP as they develop the new EIS.*

Relevant ODFW Authorities:

ODFW recommendations on the JCEP/PCGP project are guided by the following statutes, rules, and plans.

- Wildlife Policy (ORS 496.012): Establishes wildlife management policy to prevent serious depletion of any indigenous species and maintain all species of fish and wildlife at optimum levels for future generations.

- State Endangered Species Act (ORS 496.171-182): Requires conservation and recovery of wildlife species that are classified as endangered or threatened. Authorizes ODFW to develop conservation and recovery plans for listed wildlife species. At ORS 498.026(1), prohibits "taking" of any listed species. Illegal take is a violation of the wildlife laws, subject to criminal prosecution as a Class A misdemeanor or violation pursuant to ORS 496.992.

- Prohibition of harassment, etc. of wildlife (ORS 498.006): Prohibits chasing, harassment, molestation, worrying or disturbing any wildlife, except as the Fish and Wildlife Commission may allow by rule.

- Criminal penalties for wildlife violations (ORS 496.992): Makes violation of any wildlife statute or Fish and Wildlife Commission rule subject to prosecution as a Class A misdemeanor or violation.

- Fish and Wildlife Habitat Mitigation Rule (OAR 635-415-0000-0025): Governs ODFW's provision of biological advice and recommendations concerning mitigation for losses of fish and wildlife habitat caused by development actions. Based on standards in the rule, ODFW determines the appropriate category to apply to land where a development action is proposed. If ODFW determines that such land is Category 1, ODFW must recommend that impacts to the habitat be

avoided. If impacts cannot be avoided, ODFW must recommend against the development action. If ODFW determines that such land is Category 2, ODFW must recommend that impacts to the habitat be avoided. If impacts cannot be avoided, ODFW must recommend a high level of mitigation (as specified in more detail in the rule). If such mitigation is not required, ODFW must recommend against the development action.

- Wildlife Diversity Plan (OAR 635-100-0001 through 0030): Establishes a plan to maintain Oregon's wildlife diversity by protecting and enhancing populations and habitats of native wildlife at self-sustaining levels throughout natural geographic ranges.

- Oregon Conservation Strategy Plan (Adopted by Commission): A blueprint for conservation of the state's native fish and wildlife and their habitats, the Strategy provides information on at-risk species and habitats identifies key issues affecting them and recommends actions. The Conservation Strategy emphasizes proactively conserving declining species and habitats to reduce the possibility of future federal or state listings.

- Oregon Plan for Salmon and Watersheds (ORS 541.405): Establishes plan to restore native fish populations, and the aquatic systems that support them, to productive and sustainable levels that will provide environmental, cultural, and economic benefits.

- ODFW Fish Passage Law (ORS 509.580 - 509.645): Requires upstream and downstream passage at all artificial obstructions in those Oregon waters in which migratory native fish are currently or have historically been present.

- General Fish Management Goals (OAR 635-007-0510): Establishes the goals that fish be managed to take full advantage of the productive capacity of natural habitats, and that ODFW address losses in fish productivity due to habitat degradation through habitat restoration.

- Native Fish Conservation Policy (OAR 635-007-0502-0535): Protects and promotes natural production of indigenous fishes.

- Trout Management (OAR 635-500-0100-0120): Requires maintenance of genetic diversity and integrity of wild trout stocks, and the protection, restoration, and enhancement of trout habitat.

- Oregon's Mule Deer Management Plan (OAR 635-190-0000-0030): Establishes a plan to protect and enhance mule deer populations in Oregon, to provide optimum balance among recreational uses, habitat availability, primary land uses and other wildlife species.

- Oregon's Elk Management Plan (OAR 635-160-0000-0030): Establishes a plan to protect and enhance elk populations in Oregon, to provide optimum recreational benefits to the public and be compatible with habitat capability and primary land uses.

- Oregon's Wolf Conservation and Management Plan (OAR 635-110-0000-0040): Establishes measures ODFW will take to conserve and manage the species. This includes actions that could be taken to protect livestock from wolf depredation and address human safety concerns.

General Comments

Staffing/Project Management – A project of this scale has the potential to significantly impact fish and wildlife habitats, and requires a substantial investment of ODFW staff to time to analyze and make recommendations. To ensure thorough and timely review of this project among other competing priorities, ODFW recommends FERC require JCEP/PCGP to develop and implement an agreement with ODFW to fund a limited duration ODFW employee to serve as the JCEP/PCGP Liaison. The JCEP/PCGP Liaison would be the primary ODFW DEIS reviewer and serve as technical advisor on fish passage/pipeline construction liaison through construction and 1 year following. The biologist would provide the bulk of comments on the DEIS in coordination with ODFW staff; work across ODFW District and Region boundaries and with ODFW headquarters staff to coordinate prompt agency responses and recommendations as fish, wildlife, and habitat related issues arise before, during, and following construction; work with FERC and the applicant on data needs; provide the on-the-ground connection between the project needs and ODFW policy requirements and recommendations; coordinate with U.S. Forest Service, Bureau of Land Management, and U.S. Fish and Wildlife Service biologists; actively participate in the state and federal permitting processes; and coordinate with other state and local agencies as appropriate.

Natural Resource Technical Advisory Group – ODFW recommends FERC and/or JCEP/PCGP create a Natural Resource Technical Advisory Group (NRTAG) to serve as a technical team to minimize environmental impacts. A Natural Resource Technical Advisory Group could include the Applicant, and natural resource knowledgeable professionals from appropriate agencies, tribes, and pertinent others. The role of the NRTAG would be to assist project managers with project planning, adaptive management, and implementation assuming FERC authorization. The NRTAG could interact with FERC and JCEP/PCGP to provide specific guidance/feedback, evaluation of potential ecological impacts risks, needed monitoring/studies, and post-study ecological assessment relating to:

- Direct and indirect construction impacts of the project.

- Post-construction legacy impacts to fish and wildlife production on the site.

- Precise methods of study to determine/measure the magnitude of both project impacts and restoration/mitigation effectiveness.

- Assist with development of mitigation strategies, provide implementation guidance, and assist with identifying monitoring needed to ensure JCEP/SDPP effectiveness of mitigation.

ODFW recommends the NRTAG be comprised of members from federal agencies (e.g. US Fish and Wildlife Service, US Forest Service, US Bureau of Land Management, US Geological Survey, National Oceanic and Atmospheric Administration/National Marine Fisheries Service, Army Corps of Engineers, etc.), tribes (e.g., Coquille, Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians), state agencies (e.g. Oregon Department of Land Conservation and Development, ODFW, Oregon Department of Agriculture, Oregon Department of State Land, Oregon Department Water Resources, Oregon Department Environmental Quality), and other stakeholders (e.g. University of Oregon – The Oregon Institute of Marine Biology, South Slough National Estuarine Research Reserve, Oregon Association of Clean Water Agencies, etc.)

Fish Passage - It is a policy in the State of Oregon to provide upstream and downstream passage for native migratory fish (see ORS 509.580 through 509.910 and corresponding Administrative Rules OAR 635-412-005 through 0040). Fish passage is required in all waters of Oregon in which native migratory fish are currently or were historically present. With some exceptions defined in ORS 509.585, a person owning or operating an artificial obstruction may not construct or maintain any artificial obstruction across any waters of this state that are inhabited, or historically inhabited, by native migratory fish without providing passage for these fish. Projects that construct, install, replace, extend, repair or maintain, and remove or abandon dams, dikes, levees, culverts, roads, water diversion structures, bridges, tide gates or other hydraulic facilities can be "triggers" to Oregon's fish passage rules and regulations. Specific information relating to Oregon Fish Passage Law can be viewed on our website at the flowing location: http://www.dfw.state.or.us/fish/passage/

The JCEP/PCGP project will have a significant number of stream crossings that will trigger Oregon's fish passage rules. For each stream crossing with current or historic native migratory fish presence, ODFW recommends the JCEP/PCGP applicant work with ODFW to develop a plan that addresses site-specific impacts and compliance with Oregon fish passage laws and rules. ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW and receive approvals under Oregon Fish Passage Fish Passage Law for each individual stream crossing which "triggers" OAR 635-412-0005 through 0040 prior to authorization of project construction.

In-Water Work/In-Water Blasting – The JCEP/PCGP project will involve construction work within waters of the state inhabited by fish and aquatic wildlife. ODFW has guidelines for appropriate timing of in-water work which can be found at http://www.dfw.state.or.us/lands/inwater/. These guidelines provide a way of planning in-water work during periods of time that would have the least impact on important fish, wildlife, and habitat resources. Specific recommendations related to in-water timing are also briefly discussed below, however ODFW recommends FERC require the Applicant to work with ODFW to

identify appropriate in-water timing windows on a site-specific basis and according to the above guidelines.

For those instances where in-water blasting may be unavoidable and necessary on this project, the JCEP/PCGP applicant must acquire in-water blasting permits from ODFW. Information on this process can again be found at the in-water link above.

Fish and Wildlife Habitat Mitigation - ODFW recommends that the applicant complete an adequate habitat avoidance, minimization, and mitigation plan for any anticipated impacts to fish and wildlife habitats for the JCEP and PCGP portions of the project prior to issuance of a site certificate or completion of the NEPA process. This habitat avoidance, minimization, and mitigation plan should include categorization by Habitat Category (1-6) of all habitats directly or indirectly affected by the proposed project consistent with Oregon's Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0000 through -0025) and subject to ODFW expert professional judgment and review. ODFW further recommends avoidance of impacts to all Category 1 habitats and mitigation proposal(s) to replace lost form and function to remaining Categories 2-6 habitats consistent with the policy. The ODFW's Fish and Wildlife Habitat Mitigation Policy can be viewed at http://www.dfw.state.or.us/OARs/415.pdf.

Specific Comments

Issue	Issue Description	Recommended Resolution
Channel Modification	The 2015 DEIS briefly described but did not analyze the cumulative impacts from the **"Coos Bay Channel Deepening/Widening Project"** ("Pilots' Channel Modification Project", proposed by the Port of Coos Bay). ODFW understands that the current proposal moving forward is to deepen the channel to a navigation depth of 45 feet and widen the channel over 100 feet, which will result in removal of 12.0+ million cubic yards of additional material from Coos Bay. This material will require an open ocean disposal site over 2,000 acres in size that will be buried to a depth of ~15.0 feet.	• Since JCEP will create the terminal, own the terminal, and be a primary benefactor of the channel modification that is proposed to River Mile ~ 8.0, ODFW believes the Pilots' Channel Modification Project is a connected action to the JCEP/PCGP project. ODFW recommends the DEIS include a full analysis of the Port's proposed "Pilots Channel Modification Project".
Pipeline Crossing Across Coos Bay to East of Hwy 101	**Potential for Frac-Out with long distance HDD Drilling:** ODFW recognizes the JCEP/PCGP Applicant's efforts to reduce environmental impacts of the pipeline crossing to the east side of Coos Bay and foothills from the previously proposed "Open Cut" methods to HDD drilling methods. However, given the	• ODFW recommends FERC require JCEP/PCGP develop frac-out containment and mitigation plans in coordination with the State of Oregon. • ODFW recommends that emergency plans include

	very long (> 8000 feet) HDD strategy, there remains a substantial potential for frac-out issues (defined here as the unintentional return of drilling fluids to the surface during HDD).	immediate notification of any turbidity exceedance, frac-outs, and spills and pipeline leaks in Coos Bay. Sensitive marine environments can be severely impacted by these types of occurrences. However, impacts can be greatly minimized if ODFW biologists can quickly & accurately assess potential damages and recommend remediation actions. Should an incident like those described above occur, the project should contact Oregon Emergency Response System immediately (1-800-452-0311). In the case of leaks during pipeline operation or offloading or loading at the JCEP facility, ODFW recommends that emergency plans include surveys for fish and wildlife kills immediately following a release.
Stream Crossings – Avoidance, Minimization, and Mitigation of Impacts to Habitat and Water Quality Associated with Stream Crossings	*Please see Oregon Fish Passage Law General Comment above.* It is known that ESA-listed fish specie(s) and or State Sensitive species will be present at the South Coos, North Fork Coquille, and East Fork Coquille river crossings include OC Coho salmon. State Sensitive-Vulnerable species include Coho salmon (coastal coho salmon SMU/Oregon Coast ESU). Winter steelhead (Oregon Coast ESU/coastal winter steelhead SMU) are considered Sensitive-Vulnerable in the Coquille River basin, however, not in the Coos River basin. Pacific lamprey (*Entosphenus tridentata*) are considered Sensitive-Vulnerable in the Coos River, Coquille River, and Umpqua River basins making turbidity concerns heightened throughout in these watersheds, in addition to the concern within the Rogue River watershed.	• The JCEP/PCGP project needs to address turbidity control measures for sediment generated at stream crossings, isolation of the work area, salvage of fish, Best Management Practices (BMP's) for equipment operation, measures for handling frac-outs if they occur, minimizing impacts to the riparian zone, and revegetation strategies for all stream crossings containing native and migratory fish. • ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW and construct all fish bearing stream crossing actions within the periods identified in ODFW's standard In-Water Work timing guidance document unless otherwise approved in writing by ODFW. ODFW's standard In-Water Work timing guidance document can be viewed on our

		website at the following location: http://www.dfw.state.or.us/lands/inwater/. **Note:** ODFW advises this it is not *biologically defensible to support any in-stream work during time periods when fish are actively spawning, migrating or when eggs or juveniles may be present in the gravels.* • ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW and acquire all needed state and Federal authorizations to salvage fish and/or aquatic wildlife which would otherwise be likely subject severe stress or mortality as a result in-water work, as appropriate at a site specific level. • ODFW recommends salvage of fish and/or aquatic wildlife occur as appropriate and as feasible throughout the project locations. Detailed information on necessary state authorizations for fish and aquatic wildlife salvage, recommended protocols, and standard BMPs is available from ODFW upon request.
Stream Crossings – Subsurface Boring and Drilling	ODFW's experience with other pipeline construction projects has shown that stream crossings and overland disturbance can be damaging to watercourses if not carried out with extreme diligence. During construction of the Coos County Gas Pipeline horizontal directional drilling (HDD) was stated as being "clean and not impacting streambeds", however, "frac-outs" occurred and incurred environmental damage caused by drilling fluids leaking into fish-bearing streams. Drilling fluids can be water or oil-based and can include other additives. Although the bentonite base is claimed to be a benign ingredient,	• The Applicant should be prepared for construction stoppages, cleanup, and remediation of damages caused by frac-outs. For that reason, crossings construction timing should occur during ODFW's recommended in-water timing guidance or as otherwise approved by ODFW in writing. HDD and other subsurface boring or drilling crossing design locations should pro-actively address the risks associated with the potential for a "Frac out" or inadvertent loss of drilling fluid to the extent practicable:

	ODFW is unaware of what the other additives are and how harmful they can be to fish and aquatic wildlife. Between August and October of 2003 MasTec North America, Inc. was cited by DEQ for a series of water quality violations. The violations were a result of frac-outs during the horizontal drilling work for the construction of a natural gas pipeline under the North Fork of the Coquille River in Coos County. If similar frac-out related turbidity discharge impacts were to occur at the proposed Rogue River crossing, they would likely impact the significant spawning habitat for spring-run Chinook salmon in the Rogue River Basin.	• ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW including submittal of any risk assessment and geotechnical documentation for any stream crossing which are proposed as subsurface boring or drilling stream crossing actions. Submittals should also include descriptions of alternate or contingency crossing methods should the primary method result in an inadvertent loss of drilling fluid, otherwise known as a" frac-out" or otherwise fail as a successful crossing action. ODFW further recommends FERC condition the project certificate such that the Applicant is required to: • Conduct adequate geotechnical analysis to ensure frac-outs will not occur (e.g. identify vulnerable geologic issues, adjust the depth of drilling, etc.). • Provide a list of the additives used in drilling fluids and their potential effects on the aquatic environment. • Implement specific drilling BMPs to ensure constant monitoring of drilling fluid return volume so that drilling can cease immediately if drilling fluid is not returning at the expected/standard volume for a successful HDD attempt. • Identify measures that will be taken to minimize impacts of a frac-out if a frac-out occurs and mitigation that will be implemented if a frac-out occurs as cleanup is not feasible and

		attempts will create additional damage. Mitigation could include: Placement of LWD; placement of clean washed spawning gravel; road drainage improvements (cross drains, improved surfacing); road decommissioning. • Establish performance bonds and/or require performance bonds of drilling subcontractor to ensure adequate funding is immediately available to address/mitigate a frac-out or other drilling failure which results in damage to fish, wildlife, or the habitats they depend on. • ODFW recommends that emergency plans include immediate notification of any turbidity exceedance, frac-outs, and spills and pipeline leaks for both the JCEP facility and PCGP. Sensitive fish and wildlife habitats can be severely impacted by these types of occurrences. However, impacts can be greatly minimized if ODFW biologists can quickly & accurately assess potential damages and recommend remediation actions. Should an incident like those described above occur, the project should contact Oregon Emergency Response System immediately (1-800-452-0311). In the case of leaks during pipeline operation or offloading or loading at the JCEP facility, ODFW recommends that emergency plans include surveys for fish and wildlife kills immediately following a release. <u>HDD Actions in the Lost River Drainage.</u> The Klamath Fish District of ODFW requests that drilling any HDD activities are implemented between July 1, and October 31, or

		as soon as water conditions are deemed uninhabitable by fish due to poor water quality. Shortnose suckers (*Chasmistes brevirostris*), Lost River sucker (*Deltistes luxatus*) and redband trout (*Oncorhynchus mykiss*) inhabit this stretch of river from November to July; poor water quality triggers migration to upstream refuge habitats. Fish are highly sensitive to sound waves that could be caused by drilling disturbances and sound waves could act as a migration barrier.
Stream Crossings – Non-fish bearing streams and other stormwater drainage conveyance structures	Although non-fish bearing stream crossings and stormwater conveyance infrastructure are not subject to the same design criteria identified above for fish bearing stream, these types of structures do impact aquatic species habitats.	• ODFW recommends that all streams be considered fish bearing unless documented to be absent of fish. If a stream crossing or storm water conveyance structure is determined to be non-fish bearing, ODFW still recommends the work be completed within ODFW's standard In-Water Work timing window. • Culverts or other crossing infrastructure should be sized in excess of hydraulic capacity need to help facilitate wildlife connectivity between habitats and minimize potential downstream water quality impacts such as turbidity sedimentation transport resulting from scour at undersize infrastructure. • ODFW recommends the Applicant consider oversizing the infrastructure and installing it in such a manner to maximize its performance as a suitable wildlife crossing structure and to minimize potential for downstream water quality impacts such as turbidity sedimentation transport resulting from scour at undersize infrastructure.
Stream Crossings -	**Site Specific River/Stream Crossing**	ODFW encourages both the

Site Specific River/Stream Crossing Concerns	**Concerns:** There are sites where construction impacts to streams are of greater risk or construction has added complexities	Applicant and FERC to acknowledge the potential for severe impacts to fish, aquatic wildlife, and the habitats they depend on by ensuring the above recommendations become conditions of any Federal Authorizations or permits for the PCGP project. ODFW recommends site specific coordination and consultation between the Applicant and ODFW staff to fully identify unique site specific resource concerns at these crossing locations. ODFW anticipates that significant resource impact avoidance and minimization can be realized through collaboration with local ODFW staff throughout the crossing design, construction, and restoration/mitigation recovery phases at these river crossing locations. **Klamath River Crossing:** ODFW **does not** support open trench methods at this location. In the event of a catastrophic spill or release, a contingency plan should include an evaluation of needs for dilution flows and dewatering. Flows from upstream can be manipulated by the Bureau of Reclamation and downstream irrigation canals can be manipulated by irrigation districts for dewatering. **Rogue River Stream Crossing:** Pacific Connector states that if HDD of the Rogue River is unsuccessful Direct Pipe (DP) methods would be a potential option. Previously wet, open-cut crossing were also proposed. ODFW **does not** consider a wet, open-cut to be an acceptable contingency method. **South Umpqua Direct Pipe**

		Technique Site #1 at MP 71.3), and South Umpqua Open Cut Site #2 at MP 94.73; see Tables 2 and 3; 2015 DEIS - This proposed crossing occurs at an ecologically important site. A gravel bar is located approximately 300 m downstream. The gravel bar at this site provides river complexity, high flow refugia and summer slow water habitats which are considered to provide both essential and limited habitat function for a variety ESA-listed fish, state-sensitive listed fish and aquatic wildlife. **Fate Creek:** The 2015 DEIS did not provide a site specific plan for Fate Creek. The resource plans do not address or mitigate for all impacts associated with stream crossings under ODFW's Fish and Wildlife Habitat Mitigation Policy. ODFW recommends that special consideration for impacts at Fate Creek are incorporated into construction planning including potential mitigation for impacts.
Fish Screening Criteria (ORS 498.306)	**Screening and Water Intake Concerns for Ships in the JCEP Slip**: The 2009/2016 FEIS did not adequately address ODFW's previous comments on Fish Screening and Water Intake impacts. The 2008 project DEIS was drafted such that a screening system would be developed with the intent of meeting current ODFW and National Marine Fisheries Service (NMFS) fish screening requirements. ODFW has adopted the National Marine Fisheries Service Screen Criteria by administrative rule in order to provide a consistent guidance platform to the general public.	ODFW recommends these criteria be incorporated formally in this project. Screening Criteria are included in the NOAA Passage Facility Design Criteria under section 11 starting on page 86 of http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish-Passage-Design.pdf**.** The ODFW fish screening website is: http://www.dfw.state.or.us/fish/screening/index.asp.
ODFW's Scientific Take Permits	ODFW's Scientific Take Permits are relevant to coordinate salvage and movement of fish and wildlife species impacted during a project.	• ODFW recommends a condition be included for the Applicant to apply for and comply with state scientific taking permits. • ODFW recommends that the

		pipeline staff report quantified known injuries and mortalities by species during construction of the project. • ODFW recommends that the PCGP staff report injuries and mortalities of fish and wildlife by species associated with construction and or operation of the pipeline or in an emergent event.
Category 1 Habitats	See General Comments – Fish and Wildlife Habitat Mitigation Policy above. Consistent with the Fish and Wildlife Habitat Mitigation Policy (Oregon Administrative Rule 635-415-000 through 0025), ODFW recommends avoidance of impacts to all fish and wildlife habitats identified as Category 1 habitat. ODFW comments relative to the review of the 2009/2016 project FEIS' included the following statements regarding proposed impacts to Category 1 habitats, which were not adequately avoided: For the JCEP/PCGP Project, the Category 1 habitats that would be impacted consist of: coniferous old growth and late successional forest (a portion of this acreage with spotted owl and marbled murrelet use); vernal pool wetlands; mature oak woodlands; and rare plant habitat. The Fish and Wildlife Habitat Mitigation Policy states that: "The Department shall act to protect Category 1 habitats described in this subsection by recommending: (A) avoidance of impacts through alternatives to the proposed development action; or (B) no authorization of the proposed development action if impacts cannot be avoided."	In accordance with the Fish and Wildlife Habitat Mitigation Policy and administrative rules, ODFW recommends that JCEP/PCGP either avoid the impacts to the identified Category 1 habitats through alternatives or that the project not be authorized.
Natural Gas	**Controlling Transmission Pipeline**	ODFW remains concerned with

Pipeline Shut-Off Valves	**Failures**	potential impacts to fish, wildlife, and their habitats from unanticipated failures or gas releases. Therefore, ODFW recommends frequent and strategically located shut-off valves, to the extent practicable, in order to minimize the location of and extent potential impacts to fish, wildlife, and the habitats they depend on should failures or gas releases occur during construction or over the life the project. An Operations and Maintenance (O&M) plan should be developed with contingencies identified for any need repair, maintenance, or in case of a failure in and around sensitive aquatic habitats such as waterway crossings.
Noxious Weeds	Invasive species (e.g. noxious weeds) have been identified as one of the seven key conservation issues (threats to conservation) in Oregon in the Oregon Conservation Strategy (Oregon Conservation Strategy; ODFW 2005). Hundreds of thousands of dollars are expended annually on both public and private lands to combat invasion and expansion of noxious weeds and their deleterious effects on fish, wildlife, and their habitats. Specific invasive concerns include: • Gorse in the Coos Bay region has had substantial negative impacts on elk production in the Coastal frontal zone. • Scotch broom is considered a substantial factor decreasing production of elk and deer forage across the Coast range and some of the interior locations of Oregon. • It is strategically important that	• ODFW recognizes the efforts of the Applicant in developing the "*Integrated Pest Management Plan"*. However, ODFW recommends that the Applicant complete a more comprehensive noxious weed control plan prior to issuance of a site certification or completion of the NEPA process. • ODFW recommends broader scale monitoring for noxious weeds, beyond the targeted sites discussed. • ODFW recommends that performance metrics be included in order to document success or failure of the "*Integrated Pest Management Plan"*, and that additional mitigation be undertaken if the final state of the pipeline is not satisfactory regarding avoidance, prevention, and minimization of noxious weeds. • ODFW recommends wash stations

	equipment be cleaned prior to moving to different sections of the pipeline. • ODFW considers the risk of weed spread on mitigation sites and where mitigation measures are employed to likely be high rather than low.	for equipment be set up to handle aquatic invasive species as well. Equipment should be cleaned between individual subbasins at the HUC 6 level or if the machinery has been in a known area with invasive/noxious weeds. • ODFW recommends that FERC include conditions outlining that the noxious weed plan have specific strategies (i.e. cleaning of equipment, monitoring, and control measures) for the JCEP project and individual reaches of the PCGP project. • Mowing is considered a preferential treatment to herbicides when effective. • ODFW recommends the Applicant acknowledge that the risk of invasion of noxious weeds on the pipeline route and mitigation sites is likely high and ensure the following: • ODFW recommends the Applicant fund an Oregon Dept. of Agriculture (ODA) weed extraction teams within the affected counties • ODFW recommends the PCGP project include ODFW in the list of agencies consulted and include our comments for noxious weed management. • ODFW recommends the Applicant describe the experience/qualifications of the staff used to conduct noxious weed surveys. • ODFW recommends the PCGP project should provide some level of assurance that environmental

		inspectors will have the capacity in their schedule to ensure noxious weed management concerns are addressed. • ODFW recommends that EI's should inspect new equipment arriving on site. Any protections given to federal lands should also be given to non-federal lands. • ODFW recommends the PCGP project develop an incentive/dis-incentive program to greatly increase the likelihood the potential for a contractor driven inspection system (with random EI investigations) to function effectively. • ODFW recommends a buffer should be applied to known noxious weed infestation areas. Accordingly, soil should not be moved out of these sites. These sites should be treated to prevent spread of noxious weeds to uninfested areas. • ODFW recommends that protection measures for federal lands should also be applied to non-federal lands. • ODFW recommends the PCGP project needs to provide extended monitoring at known infestation sites, dewatering stations, and all other high-risk sites on private lands as well. Monitoring the ROW only likely inadequate. • ODFW recommends that PCGP employ independent consultant noxious weed specialists to conduct periodic on-going monitoring to maintain a sufficient level of certainty that noxious weed issues are addressed.

		Periodic monitoring needs to be completed for the life of the project on all disturbed ground with special emphasis at known infestation, dewatering stations, and equipment cleaning locations.
Overarching Habitat Mitigation Expectations (Aquatic, Wetlands, Riparian, and Uplands):	**Points of Diversion Fish Screening:** The Applicant has previously identified Points of Diversion (POD's) that are within 150 feet of the work area. Many POD's have water conveyance ditches outfitted with fish screens. Not all fish screens are located in the immediate vicinity of the POD. **Herbicide Use Near Streams/Wetlands:** The Applicant states that pesticides or herbicides will not be used in or within 100 feet of wetlands unless allowed by the land management or permitting agency. **Small Stream Temperature Issues:** The 2015 DEIS stated "In streams that have very small flows, lack of shade may raise stream water temperatures and reduce LWD supply." It is also stated, "streams with low or intermittent flow generally support smaller fish populations and less diverse species composition." However, Rogue summer steelheads primarily rely upon streams with low or intermittent flow for spawning and brief periods of rearing. Numerous intermittent streams within the Coastal Range are also important for Coho production.	• ODFW recommends FERC require the Applicant to work with ODFW to identify best management practices with regard to fish screening, herbicide use, and streamside shading
Upland Impact/Mitigation	ODFW has previously provided feedback to the Applicant: • Regarding snag creation, and elk habitat/forage. Previous feedback for creating forage areas for deer and elk using ODFW's recommended forage seeding mixture was not addressed. • ODFW's recommended snag	ODFW recommends further discussion of upland mitigation proposals, including: • Mitigation in the form of incorporating specific snag densities, down wood, danger tree replacement, and legacy trees. Many of these rare upland habitat types may provide

	retention concept was addressed, but the species of conifers, minimum diameter at breast height (dbh) used, and number per acre or linear foot were not estimated. • ODFW's recommended down wood concept was addressed, but the species of trees, minimum dbh used, linear feet per acre, and number per acre were not estimated. • ODFW's recommended legacy tree concept was not addressed at all including the species of trees, minimum dbh used, and number per acre were not estimated.	essential habitat function for critical life stages of fish and wildlife. If habitats or habitat function are mis-categorized and/or critical habitat functions are not adequately compensated for, the proposed mitigation sites may fail to meet or exceed ODFW's specific mitigation recommendations. • ODFW recommends further discussions regarding elk and deer forage plantings within the pipeline corridor with the recommendation that production wildlife forage be considered a goal of the final vegetative community in the pipeline corridor.
Description of Oak Woodlands	Oak woodlands are a unique and highly productive habitat that is limited in quantity. Oak woodlands require a long-time (100+ years) to reach full productivity and function as habitat, and Oak Woodlands have been classified by ODFW under the agency Habitat Mitigation Policy (OAR 635-415-0000-00025) as Category 2. Many of these woodlands have critical function as winter range for big-game and meet life history needs for a variety of migratory birds (e.g. Acorn woodpeckers), forest herps and small mammals.	ODFW recommends oak woodlands receive particular attention in the DEIS and that the Applicant work with ODFW to develop avoidance, minimization, and/or mitigation plans for this important habitat type.
Duration of Habitat Mitigation/Restoration Benefits Commensurate to Habitat Impacts:	The previous DEIS stated that non-forested habitats within the temporary construction right-of-way would be restored relatively quickly. "*Relatively quickly*" is vague term. Shrub steppe habitats can take considerable time to restore to pre-project functional condition especially sage brush species which can take decades to regrow to their previous structural condition.	• ODFW recommends impacts to habitats be quantified into reasonable likely time frames measured in years. • ODFW recommends mitigation be proposed to compensate for the temporal loss of impacted and then restored habitats. • ODFW recommends the functional benefits of mitigation meet or exceed the likely duration of

		impacts regardless of if they are estimated to be shorter term
Water quality Impacts from Sedimentation, Storm water Runoff, and Roads	**Sedimentation Impacts from Clearing and Grubbing Large sections of ROW:** This section lists actions designed to reduce run off and catch sediment. One thing missing is a discussion identifying how much area will be cleared and grubbed at one time. Lessons learned from the ODOT's Pioneer to Eddyville project (in the Coast Range Mountains) include the need to limit the amount of ground cleared of vegetation at any one time. The pipeline will cross 47 miles of the Coast Range, so special care should be taken to limit erosion and sediment loss in this section as well as any other areas of significant rainfall with steep slopes. The timing of the pipeline construction should allow for ground clearing to occur after the spring rainy season and any areas opened up should be seeded and vegetation established before the fall rains. Distance and slope can be taken into account regarding the amount of land cleared and grubbed, i.e. the greater the distance from a creek and the flatter slope, the less concern for down slope sediment escape and erosion that can ultimately impact water bodies. The DEIS recognizes the geological instability of the Coast Range in the following sections: Chapter 4, Page 4-503, under Landforms and Erosional Processes, paragraph 1: *"Unstable landscapes (i.e., earthflows) may constrict or deflect stream channels…."* And same page under Climate, paragraph 1: *"the Coast Range receive some of the highest precipitation totals in the continental U.S., with some areas receiving up to 200 inches per year."* **Pipeline Steep Slope Concerns and**	**Sedimentation Impacts from Clearing and Grubbing Large sections of ROW:** Given the known instability and potential precipitation levels in the Coast Range Mountains ODFW recommends: ODFW recommends that the Applicant develop a detailed written plan that identifies the maximum amount of land cleared and grubbed at one time. The plan should also identify (1) areas of high, medium, and low levels of risk for sediment escape and impacts to water bodies. Based on slope and proximity to water bodies, and (2) include a re-vegetation section that ensures re-establishment of vegetation in high and medium risk areas prior to the fall rains. **Pipeline Steep Slope Concerns and Roads:** Pipeline Steep Slope Concerns: Stabilization/erosion control of upland slopes following pipeline construction will be nearly as important as stabilization/erosion control in riparian areas adjacent to streams. Some extremely steep slopes will be encountered in the Coos County portion of the pipeline. ODFW recommends the following for locations where the pipeline will traverse or the route will be placed on slopes which qualify as High Landslide Hazard Locations (HLHL as defined in ***Oregon Dept. of Forestry Technical note 2.0 vers 2.0; (ODF Jan 1, 2003)***; in Tyee Sandstone over 65% slope on headwall locations and 75% ridges): ODFW recommends the pipeline construction route incorporate cross slope trenching as opposed to

	Roads: A number of miles of the pipeline will be constructed on slopes that exceed 50%. Tyee sandstone geology in the Coos and Coquille River basins and the geology of the Rogue Basin to a lesser degree are highly prone to landslides if the supporting matrix is disturbed. Additionally, numerous access roads will be built to harvest timber and access construction of the PCGP. Essentially the pipeline route is a 232-mile road through the ESA listed and non-ESA listed salmonids as well as amphibians. Extensive research has documented the impacts of sediments to salmonids. Work to reduce sediment input into coastal and inland streams that will be impacted by the pipeline is foundationally critical for enhancing spawning and rearing habitat for fall Chinook salmon, Oregon Coast (OC) threatened Coho salmon, Pacific lamprey (*Entosphenus tridentata*), winter steelhead (*O. mykiss irrideus)* and coastal cutthroat trout (*O. clarki clarki)* as water quality is directly linked to hatch rates and food available for these species. Sediment loading above natural background levels contributes to embedding of substrates which often results in reduced hatch rates for eggs in redds, inability of fry to emerge from redds, inhibited production of macroinvertebrates (invertebrates largely live in the interstitial spaces of gravels), and impacts on the ability of fish to obtain food due to the nature of salmonids to feed predominantly by using their sight (Burns 1970; Hall and Lanz 1969; Weiser and Wright 1988; Suttle et al. 2004; Tripp and Poulin 1992; Waters 1995). **Emergency Response:** Emergency	routing parallel to the slope whenever possible to reduce the risk of soils moving laterally in the trench downslope (mass wasting slides). Placement of erosion control matting has been outlined as an upland soil disturbance control measure. This, in combination with cross slope placed large wood, stumps, and other wood material, is considered a modestly reasonable attempt for erosion control. ODFW recognizes that pipeline corridor management strategies are not likely to allow for placement of large wood in pipeline corridors. ODFW recommends rock or other structures be placed across the pipeline trench at a 90˚ angle and be embedded in the undisturbed walls of the trench a minimum of 4ft. to prevent free movement of soil in the disturbed pipeline trench. These structures should be placed at 100ft. intervals. Steep slope pipeline locations should receive additional efforts with seeding and mulching. Additionally, these segments of the pipeline route should have cross slope structures and drainage networks to reduce failure risk. ODFW recommends the road network: • Have surfacing that is sufficient to accommodate travel loading and prevent months. • Have cross drains installed at a density/spacing that is equivalent or exceeds to recommendations in the ODF Forest Practices Technical Note Number 8 vers.1 (ODF Jan 2003).

	plans, including immediate notification of turbidity exceedances, frac-outs, spills, and pipeline leaks for both the JCEP facility and PCGP, are considered critically important. Sensitive fish and wildlife habitats can be severely impacted by these types of occurrences. However, impacts can be greatly minimized if remediation actions are initiated quickly upon discovery of an incident.	• Have mitigation for sedimentation/mass wasting issues clearly identified in-proximity regardless of ownership (federal or non-federal) as these locations have the greatest potential for measurable improvements in reducing sediment loading to streams impacted. **Emergency Response Notification Water Quality:** ODFW recommends that emergency plans include immediate notification of: • Turbidity exceedances, frac-outs, and spills and pipeline leaks for both the JCEP/SDPP facility and PCGP. • ODFW recommends that emergency plans include surveys for fish and wildlife kills immediately following a frac-out, spill, or gas release. Should an incident like those described above occur, the project must contact Oregon Emergency Response System immediately (1-800-452-0311) in the case of leaks during pipeline operation or offloading or loading at the JCEP facility or along the PCGP route.
Species Occurrence/Status	**Pacific Fisher:** Fisher were not mentioned in the 2015 DEIS. However, Fisher may become a listed species in the near future and their presence has been documented in the PCGP route through BLM sampling efforts. **Oregon Spotted Frog:** This species is now federally listed. **Gray Wolf:**	**Pacific Fisher:** ODFW recommends the Applicant considers fisher in the assessment of impacts and incorporate measures to alleviate impacts to fisher. **Oregon Spotted Frog:** ODFW recommends the Applicant conduct surveys to identify use of habitats in the pipeline corridor by this species. **Gray Wolf:**

	Table 1 in the 2015 DEIS listed presence of grey wolves as unknown. Gray wolves have been documented in proximity of the proposed pipeline in Klamath County. **Bald Eagle:** Table 1 in the 2015 DEIS listed presence of bald eagles as unknown, bald eagles are common in many portions of the proposed PCGP route. Elsewhere in DEIS, stated that nest surveys had been conducted for bald eagles, yet Table 1 stated that no surveys were conducted. **Western Pond Turtle:** Table 1 listed presence of western pond turtles as unknown. Western pond turtles have been documented in the immediate vicinity of the pipeline crossing at Klamath River and are likely present at the Lost River crossing and in the upper Middle Fork Coquille River.	Information should be updated to reflect currently documented gray wolf use in the project vicinity. **Bald Eagle:** Information for this species should be updated to reflect accurate bald eagle use in the project vicinity as well as consistent descriptions of nest surveys. **Western Pond Turtle:** ODFW recommends that information for this species be updated to reflect accurate likely and known occurrences at the two locations. Measures need to be taken to identify known and likely western pond turtle habitats, particularly, nesting habitats. (see below for greater detail).
Wildlife Survey Methodology	It is ODFW's understanding that some wildlife surveys will be repeated for the development of the new EIS. ODFW has already provided FERC and the Applicant with some recommendations regarding wildlife surveys. Please consider these additional recommendations related to impacts to raptors.	ODFW recommends the Applicant provide detailed documentation on proposed nest survey methodology including: • Protocols, survey timing, and minimum experience requirements for surveyors. • Information should be species specific and include means to address all four components of corresponding issue/concern. • Raptor nest surveys should occur for both known and new nests prior to clearing of the PCGP ROW. • The list of raptors identified for pre-timber falling surveys should be expanded to include golden eagle, northern goshawk, Swainson's hawk, flammulated

		owl, and short-eared owl. With the exception of golden eagle, which is a federally protected species, the other species are Oregon Conservation Strategy species and/or state Sensitive Species.
Noise Impacts	**Noise and Direct Impacts to Wildlife:** The PCGG project will incur substantial disturbance due to direct interaction of construction activities with fish and wildlife as well as the associated noise. These impacts will likely displace a number of species including marbled murrelets, Northern spotted owls, and golden eagles, among others. Impacts will occur during construction, with longer-term impacts due to the change of the habitat with clearing of the pipeline route.	ODFW recommends information be included in the EIS regarding the potential daily magnitude and duration of construction and operational related disturbances, and determination if these disturbances are likely to occur during periods when currently existing (non-related) disturbances are minimized or absent. ODFW recommends: • The Applicant consult the Oregon Forest Practices Act guidelines for ospreys and great blue herons protections; • The Applicant consult USFWS under the Bald and Golden Eagle Protection Act for federal recommendations to protect bald and golden eagles nests; and, • The Applicant consults USFWS under the Federal Endangered Species Act for federal recommendations to protect spotted owls and marbled murrelets. • ODFW recommends noise impacts be analyzed using methods acceptable to ODFW and US Fish and Wildlife Service. Impacts should be avoided, minimized, and mitigated for (mitigation sequencing), as practicable and in collaboration with ODFW and USFWS.

Environmental Inspectors	Properly trained environmental inspectors can significantly avoid and minimize impacts to fish and wildlife and their habitats during project construction.	• ODFW recommends that the Applicant determine the number of environmental inspectors they will need and coordinate with state and federal agencies depending on the training they will receive. • ODFW recommends that the PCGP project have environmental inspectors on all active construction segments of the pipeline project.

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Oregon Water Resources Department

Please accept the following response from the Oregon Water Resources Department (OWRD) concerning the above-referenced projects.

OWRD has jurisdiction over the waters of this state, including any waters of the state necessary for completion of these projects. Please note the following specific comments. ORS 536.007 (12) defines "Waters of this state" to mean any surface or ground waters located within or without this state and over which this state has sole or concurrent jurisdiction.

State statutes and rules administered by OWRD include, but are not limited to, ORS chapters 536, 537, 538, 539, 540, 541, 542, 543, 549 and Oregon Administrative Rules chapter 690.

Under Oregon law, all water is publicly owned. With a few exceptions, water use in Oregon requires authorization from OWRD before use can begin. Water use authorization may be granted under a permanent water right, or a temporary water-use authorization.

The agency is tasked with managing the waters of the state, including protecting existing water rights, and scenic waterway flows. OWRD has programs for obtaining new water rights or temporary water-use authorization. OWRD strongly encourages the parties involved to contact the Department early in the planning process. Application material may be found at OWRD's web site www.wrd.state.or.us . OWRD reserves the right to make additional comments concerning these projects as they progress through the established process.

The Water Resources Department appreciates the opportunity to participate in this process. Should you have any questions, please do not hesitate to contact me at 503-986-0817 or at Jerry.K.Sauter@wrd.state.or.us.

Oregon Department of Transportation

The Oregon Department of Transportation (ODOT) has the responsibility to preserve the operational safety, integrity, and function of the state's highway facilities. ODOT must also ensure that improvements to the highway system can be accomplished without undue impacts or damage to utilities within the highway right-of-way. It is ODOT's understanding that the proposed Jordan Cove Energy (natural gas terminal facilities) and Pacific Connector Natural Gas pipeline projects and associated activities could or will interface with state highways by crossing the highway, running parallel to the highway within the right-of-way, or running parallel to the highway just outside of the right-of-way. It is also ODOT's understanding that additional access may be needed to ODOT's facilities, and that traffic on ODOT's facilities may increase due to the projects (both during construction and upon project completion during regular operations and project maintenance).

General Requirements

Construction that may impact the state right-of-way is subject to Oregon Revised Statute (ORS) 374.305 under which no person, firm, or corporation may place, build, or construct on any state highway right-of-way, any approach road, structure, pipeline, ditch, cable or wire, or any other facility, thing, or appurtenance without first obtaining written permission from ODOT. The developers (Jordan Cove Energy Project, L.P. and Pacific Connector Gas Pipeline, L.P.), therefore, must obtain permits from each ODOT District Office where project work will occur prior to commencing construction within the highway right-of-way or usage of access connections to the right-of-way. The developer must also meet the requirements in Oregon Administrative Rule (OAR) Chapter 734 Division 51 for approach permitting and Division 55 for utility permitting through special provisions and should review rule requirements before completing plan sets and construction plans to understand stipulations related to the construction phase and future project operations and maintenance. ODOT Districts have some discretion in the issuance of a permit in order to address site specific situations such as weather/season, traffic volume, terrain, etc.

The following conditions must be fulfilled before a permit to work in the ODOT right-of-way will be issued:

- Developers must notify and work directly with ODOT where the proposed location of the terminal and pipeline facilities and associated activities are shown to be within the Potential Impact Radius (PIR) of any state highway. The PIR is based on minimum federal safety standards found in 49 CFR Part 192.

- Developers shall provide ODOT with a set of plans that include, but are not limited to, detailed construction staging plans for the terminal facility and associated LNG transfer facilities (e.g., Wharf, LNG storage tanks), expansion of upland industrial lands and access road improvements as well as pipeline route maps and construction staging plans. Developers will work with ODOT to develop design standards for all pipes and related structures within the PIR of a state highway. Design requirements include the following:

- Minimum of 10 feet of cover from the top of the pipe will be the norm unless special acceptance of a lesser amount is authorized for a specific reason. A minimum of 10 feet of cover should be used as the standard within ODOT right-of-way (more specific details can be found further in these comments).

- All pipe crossings of the highway shall be properly cased or for uncased pipeline crossings, a substantial increase in the pipeline design standards will be required.

- In no instance shall the pipeline be installed in an open trench across a state highway (more details follow).

- In no instance shall the pipeline attach to or be suspended within highway bridge structures.

- Highway access to all pipeline surface structures and assemblies, such as but not limited to gate valves and monitoring equipment, shall comply with OAR 734 Division 051. A preferred location for pipeline surface structures and assemblies is to be placed outside state highway right-of-way.

- Temporary access locations, used for construction activities, shall also comply with OAR 734-051. Modifications appropriate to provide safe operation shall be constructed at all temporary access locations, prior to construction usage. Safety modifications must be removed; and the highway and access points shall be returned to their original condition upon completion of construction activities.

- Applicant must address specific site concerns associated with their terminal and pipeline route and associated project facilities. These concerns shall be addressed to the satisfaction of the appropriate Oregon Department of Transportation District offices prior to issuance of a permit to perform work within the state's right-of-way.

- Annually, or as changes dictate, updated emergency contact information (names and phone numbers) shall be delivered to each ODOT District Manager in which the terminal and pipeline and associated project facilities may affect state highway operations and maintenance activities.

- Based on the proposed project design, per OAR 734-051-3030(4), the access to the export facility, on Highway 101, will require a traffic impact analysis (TIA) be submitted by the developers. This EIS should consider and include this TIA. The TIA will be reviewed and approved by a professional engineer employed by ODOT to determine the TIA scope and sufficiency of results to evaluate the application. Standards and criteria for evaluating applications for private approaches are listed in OAR 734-051-4020.

The developers have the sole responsibility to ensure that all required environmental statutes and codes are completely met. The developers are responsible to secure all state, federal, and local permits and clearances as required under federal, state, and local statutes or codes for all areas within ODOT right-of-way that are impacted by the development.

All impacts to the traveling public on state highways will be approved by the ODOT local District office(s). Utility coordination will be the responsibility of the developers.

The terminal and pipeline projects will need to provide traffic mitigation for all state highways affected, and the mitigation approved by ODOT prior to and for the duration of the impact. The EIS for this natural gas development should include discussion of this mitigation. The Commission should coordinate and integrate its environmental review concurrently with ODOT's to the fullest extent possible.

Thank you for allowing ODOT to comment on the proposed natural gas development. Please contact me if you have any questions regarding our comments. Susan White, susan.white@odot.state.or.us, 503-986-3519.

Oregon Department of Aviation

The Oregon Department of Aviation would like the Jordan Cove Energy Project (JCEP) to address aviation concerns as it relates to the Southwest Regional Airport (OTH).

- The structures, LNG storage tanks, LNG Tanker, boat slip, workforce housing and any other structures that may affect the Southwest Regional Airport and their aviation operations.

- Land Uses that will be used by the JCEP. This would include, but not limited to: structures, LNG storage tanks, LNG Tanker, boat slip, workforce housing and any other structures.

References:

ORS 836.535 Hazards to air navigation prohibited; exceptions. (1) A person may not construct an object or structure that constitutes a physical hazard to air navigation, as determined by the Oregon Department of Aviation in coordination with the governing body with land use jurisdiction over the property

OAR738 Division 70 – Physical Hazards to Air Navigation: Please have the applicant refer to OAR 738-070-0060 Notice of Construction or Alteration for details on this requirement.

The applicant shall fill out FAA Form 7460-1 to identify if a structure of object is to be determined as hazard or not. ODA will acknowledge receipt of the notice within 20 days (OAR 738-070-0090(1)).

It should be noted that the Oregon OAR378-070-0010(6) states that nothing in the law or these rules shall prohibit the Director from making an independent judgment or decision that may differ from the judgment or decision made by the Federal Aviation Administration on the same object or structure using FAA regulations, circulars or other publications as a basis for such finding.

Airport Land Use Compatibility Guidebook – Aviation Policy - January 2003.

Sincerely,

/s/ *Jesse D. Ratcliffe*

Jesse D. Ratcliffe
Assistant Attorney General
Natural Resources Section

JDR:jrs/#8446397

APPENDIX 2.B

ELLEN F. ROSENBLUM
Attorney General

FREDERICK M. BOSS
Deputy Attorney General

DEPARTMENT OF JUSTICE
GENERAL COUNSEL DIVISION

July 3, 2019

ELECTRONIC MAIL ONLY

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, D.C. 50426

Re: Oregon State Agency Comments on FERC's Draft Environmental Impact Statement for Docket Nos. CP 17-494-000 and CP 17-495-000 (Jordan Cove Energy Project LP and Pacific Connector Gas Pipeline LP)
DOJ File No.: 0ES456-ES456

Dear Ms. Bose:

The Oregon Department of Justice submits comments on behalf of the following agencies of the State of Oregon: Oregon Department of Energy, Oregon Department of Environmental Quality, Oregon Department of Fish and Wildlife, Oregon Department of Geology and Mineral Industries, Oregon Department of Land Conservation and Development, Oregon Parks and Recreation Department's State Historic Preservation Office, Oregon Department of Transportation, Oregon Water Resources Department, and Oregon Department of Forestry. Each agency's comments are identified by a separate header. The comments include Appendices A-E. Appendices A and B are included in the main comment document, and Appendices C-E are filed as separate documents.

Sincerely,

Paul Garrahan
Attorney-in-Charge
Natural Resources Section

Jesse D. Ratcliffe
Assistant Attorney General
Natural Resources Section

JDR:jrs/#9713443

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Oregon State Agency Comments
Jordan Cove Energy and Pacific Connector Gas Pipeline Project
Draft Environmental Impact Statement
(Docket # CP17-494-000 and CP17-495-000)
July 3, 2019

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Oregon State Agency Comments
Jordan Cove Energy and Pacific Connector Gas Pipeline Project
Draft Environmental Impact Statement

Introduction

The State of Oregon reviewed and analyzed the draft Environmental Impact Statement ("draft EIS") to ensure it provides a full and fair disclosure of the significant environmental impacts that may result from the siting and operation of the Jordan Cove LNG export terminal facility and the Pacific Connector Pipeline project (hereinafter collectively referred to as, the "Project") as well as the comparative impacts resulting from a reasonable range of alternatives to the proposed action. *See* 40 C.F.R. § 1502.1; *see also* 40 C.F.R. § 1502.1 ("An environmental impact statement is more than a disclosure document. It shall be used by federal officials in conjunction with other relevant material to plan actions and make decisions."). Accordingly, Oregon provides the following general comments as well as specific comments and recommendations from each state agency with technical expertise in its respective program area to assist the Federal Energy Regulatory Commission ("Commission") refine this draft EIS to meet the National Environmental Protection Act's ("NEPA's") requirements.

1. ***The Commission and Other Agencies May Not Rely Upon Insufficiently Detailed and Unenforceable Mitigation in this Draft EIS to Justify its Conclusion the Proposed Action Will Result in "Less-Than-Significant" Impacts***

Agencies relying upon this draft EIS to support their decisions must ensure that mitigation measures alleged to be reducing impacts to less-than-significant levels, see Section 5.1 ¶1, are mandatory, specifically described, and fairly evaluated. *See* 40 C.F.R. §§ 1502.14(f) (requiring discussion of possible mitigation measures in alternatives), 1502.16(h) (requiring discussion of mitigation in addressing environmental consequences of proposed action). The U.S. Supreme Court has stated that "omission of a reasonably complete discussion of possible mitigation measures [] undermine[s] the 'action-forcing' function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989). If proposed mitigation measures are unenforceable, or lack monitoring commitments or sufficient resources to assure performance, the Commission has no reasonable basis to conclude that such measures will effectively reduce environmental impacts. *See* 40 C.F.R. §§ 1505.2(c), 1508.25(b). Here, the Commission has represented to decision-makers and the public in this draft EIS that mitigation measures will effectively reduce environmental impacts to less-than-significant levels. As identified in the specific state agency comments that follow, the Commission has not sufficiently identified or analyzed possible mitigation measures to support that conclusion in the draft EIS, and must address the agencies' recommended mitigation measures in the final EIS.

Significantly, the draft EIS states at various points that the Commission's staff finds that adverse environmental impacts would be reduced to less-than-significant levels with the implementation of the applicants' proposed mitigation measures and additional measures recommended by Commission staff. *See* draft EIS, section 5.1. Thus, the Commission is *relying upon* the applicant's proposed mitigation to conclude that the disclosed significant environmental impacts will be reduced to less-than-significant levels. But the Commission staff only recommends a generic condition requiring the applicants to "follow the…mitigation measures described in its applications and supplemental filings (including responses to staff data requests)." *See* draft EIS, section 5.2.1. This generic condition, without any further identification as to what those mitigation measures might be, is insufficient to establish that relied upon mitigation are mandatory, specifically described, and fairly evaluated. Any mitigation that support's the Commission's conclusion that significant environmental impacts have been reduced to less-than-significant levels should be specifically listed as required measures in Section 5.2. This omission is misleading to the public and decision-makers, who would have no recourse to require the applicant to comply with its *proposed* mitigation measures disclosed and analyzed in this draft EIS if such measures are not incorporated as required conditions in the Commission's authorizations.

Further, Council on Environmental Quality ("CEQ") regulations clarify that mitigation includes "[r]ectifying the impact by repairing, rehabilitating, or restoring the affected environment." 40 C.F.R. § 1508.20(c). However, the draft EIS does not disclose whether sufficient resources are available to ensure that if an accident were to occur involving a LNG vessel that there would be sufficient funds available to carry out the necessary environmental clean-up. At present, a law may limit the liability of vessel owners to the amount of its cargo. *See* Owner's Liability Act, 46 U.S.C. 181, *et seq*. To appropriately mitigate the potential significant environmental impacts, the State urges the Commission to ensure additional resources are available to correct any resulting environmental damage from a vessel accident. We recommend FERC require the applicant to enter an agreement with each LNG vessel owner intending to berth at the terminal in which such vessel owner waives its right to (or attempt to) limit its liability under that law and to require the vessel owner provide the applicant at all times sufficient evidence that the vessel's protection and indemnity association has agreed to cover the vessel as a member of the association against the liabilities pertaining to such an accident. This is a common method in the industry of helping to ensure sufficient funds are available to respond and correct environmental disasters, and we urge the Commission to require this reasonable mitigation measure.

2. The Commission and Other Agencies Relying Upon this Draft EIS Must Correct the Deficiencies Related to Missing or Inaccurate Data and Scientific Analysis, as well as Unconsidered Environmental Impacts of the Proposed Action and Alternatives

NEPA requires that the Commission utilize "high quality" information and accurate scientific analysis," see 40 C.F.R. § 1500.1(b), and ensure "professional integrity, including scientific integrity, of the discussions and analyses" within an EIS. 40 C.F.R. § 1502.24. Oregon state agencies have identified numerous errors and deficient analysis in the draft EIS, as specifically set forth below, which the Commission must address to appropriately disclose and analyze potential significant environmental impacts to comply with that mandate.

In addition, NEPA requires disclosure and analysis of *all* direct, indirect, and cumulative environmental impacts of the proposed action. *See* 40 C.F.R. §§ 1508.7, 1508.25(c), 1502.16. Further, NEPA specifically defines "indirect effects" as those that are "caused by the action and are later in time or farther removed in distance,

but are still reasonably foreseeable." 40 C.F.R. § 1508.8(b). Accordingly, the State urges the Commission to resolve the following deficiencies in this draft EIS relative to undisclosed and unconsidered environmental impacts of the proposed action. First, the draft EIS fails to describe and assess the potential impacts on Oregon's lands and state waters due to air contaminant emissions, including greenhouse gas ("GHG") emissions, from the transportation of LNG during natural gas exploration, collection, distribution, and export to markets outside the United States. The draft EIS refers to these impacts as "'life-cycle' cumulative environmental impacts associated with the entire LNG process," but nonetheless states such impacts are "outside the scope" of the draft EIS. See draft EIS, Section 1.4. This conclusion is legally incorrect. For example, as the Ninth Circuit Court of Appeals has explained relevant to the U.S. Army Corps' similar error in construing NEPA, "while it is the development's impact on jurisdictional waters that determines the scope of [that federal agency's] *permitting authority*, it is the impact of the permit on the environment at large that determines [a federal agency's] NEPA responsibility." *See Save Our Sonoran v. Flowers,* 408 F.3d 1113, 1122 (9th Cir. 2005) (emphasis added).

Notably, the U.S. Supreme Court held that when "an agency has no ability to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant 'cause' of the effect" so as to require that agency to disclose such effects in its EIS. *Dep't of Transp. v. Pub. Citizen,* 541 U.S. 752, 770 (2004). Here though, in contrast, there is no doubt that if FERC did not approve the siting of the Project the "life-cycle" emissions associated with this Project would not be emitted into the atmosphere – no Presidential authorization allows for LNG to be extracted, sent to Coos Bay, and then shipped overseas. *See id.* at 769. Further, this is not a case where the effect is a "risk" as opposed to an effect on the physical environment. Instead, there is a direct (not attenuated) causal connection between FERC's approval of the LNG export facility and the impact on the physical environment (e.g., emissions) resulting from transportation, for example, of that LNG from where it is extracted, to Oregon, and then overseas. *See Metro. Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 774-75 (1983). Moreover, the State is not asking for more than a "reasonably thorough discussion" and disclosure of the air contaminant emissions that may result as a consequence of this approval – even if the extent of such emissions are uncertain. *See S. Coast Air Quality Mgmt. Dist. v. FERC*, 621 F.3d 1085, 1094-95 (9th Cir. 2010) (holding that an EIS's reasonable, even though limited, disclosure and analysis of emissions resulting from burning of natural gas supplied by a pipeline subject to FERC's approval "contain[ed] a reasonably thorough discussion of the environmental impact of its actions, based on information then available to it."); 40 C.F.R. § 1502.22 (addressing how an agency should handle incomplete or unavailable information in an EIS). We urge the Commission to adhere to the CEQ guidance released on December 18, 2014, which describes how the Commission should consider the effects of GHG emissions and climate change in their NEPA reviews.

The State also notes that even with respect to the proposed project's direct emissions, the DEIS only quantifies such emissions. It does not attempt to assess their significance, despite readily available tools to do so. Draft EIS, pages 4-804 through 4-807. This approach violates NEPA (*See* 40 C.F.R. §§ 1508.7, 1508.25(c), 1502.16), as two of FERC's Commissioners have acknowledged. Commissioners Glick and LaFleur have each described the inadequacies in FERC's approach to greenhouse gas emission analysis under NEPA in recent decisions on LNG terminal and natural gas pipelines pursuant to Sections 3 and 7 of the Natural Gas Act. *See*, *e.g.*, Concurrence of Commissioner Cheryl A. LaFleur on Port Arthur LNG, LLC and PALNG Common Facilities Company, LCC, dated April 18, 2019; Commissioner Richard Glick Dissent Regarding Freeport LNG Development, L.P. and FLNG Liquefaction 4, LLC, dated May 16, 2019. Commissioner Glick writes in his dissent:

> As an initial matter, identifying the consequences that those emissions will have for climate change is essential if NEPA is to play the disclosure and good government roles for which it was

> designed. By contrast, the Commission's approach in this order, where it states the volume of emissions as a share of national emissions and then describes climate change generally, tells us nothing about the "'incremental impact' that these emissions will have on climate change." It is hard to fathom how hiding the ball on a project's climate impacts is consistent with NEPA's purpose.

(Internal citations omitted). The State agrees, and urges the Commission to fully analyze the significance of GHG emissions resulting from the proposing project, as required by NEPA.

Secondly, with respect to natural gas price increases, this indirect effect will likely result in socioeconomic impacts on the State and beyond; therefore, this EIS should disclose and analyze such impacts to inform decision-makers and the public that these consequences have been considered. Although CEQ regulations state that "economic or social effects are not intended by themselves to require preparation of an environmental impact statement," in this instance the economic and social effects are interrelated with the impacts on the physical environment such that this EIS should address all such impacts. *See* 40 C.F.R. § 1508.14. This draft EIS should, therefore, disclose the potential increase in domestic natural gas prices and resulting socioeconomic impacts, including the number of affected landowners and land values reduced due to the pipeline or terminal's location. Further, since the applicant has made several claims regarding the positive potential economic effects of its planned terminal and pipeline, the Commission should assure itself that no potentially adverse economic effects negate those claims if it will rely upon this draft EIS to justify its conclusion as to whether this terminal is in the public interest or whether the construction and operation of the pipeline is required by the present or future public convenience or necessity. *See* Natural Gas Act, 15 U.S.C. §§ 717b(a), 717f(e); *see also* Certification of New Interstate Natural Gas Pipeline Facilities, 88 FERC ¶ 61,227, at 27 (Sept. 15, 1999) ("The strength of the benefit showing will need to be proportional to the applicant's proposed exercise of eminent domain procedures."). *See generally* 40 C.F.R. § 1500.1(b).

3. The Commission and Other Agencies Relying Upon this Draft EIS Must Not Foreclose Consideration of Reasonable Alternatives to the Proposed Action

The State of Oregon recommends that the Commission abandon its practice of issuing conditional orders before receiving authorizations delegated to the State under the Clean Water Act (CWA), the Coastal Zone Management Act (CZMA), and the Clean Air Act (CAA). The State urges the Commission to await such authorizations to avoid violating NEPA's procedural provisions, see 40 C.F.R. 1502.14[1], as well as the substantive provisions of the above-listed federal laws. *See* 33 U.S.C. § 1341(a); 16 U.S.C. § 1456(c)(3)(A); 42 U.S.C. § 7416; 16 U.S.C. § 1536(d); *see also* 40 C.F.R. § 402.09. NEPA mandates that federal agencies "[r]igorously explore and objectively evaluate all reasonable alternatives" as well as to "[i]nclude appropriate mitigation measures not already in the proposed action or alternatives." 40 C.F.R. § 1502.14(a),(f). However, if the Commission issues a conditional approval (after completion of this NEPA process and) before completion of necessary state authorizations under the CWA, CAA, and CZMA, see 5 U.S.C. § 717b(d), this practice will foreclose the formulation of an alternative that an Oregon state agency may deem necessary when carrying out its delegated authority under those laws. It is unwarranted to assume that the Oregon Department of Environmental Quality's ("ODEQ's") review in accordance with CWA section 401, for example, will lead to a determination that the proposed Project will not violate state water quality standards (or alternatively to assume that any

[1] Or alternatively, requiring FERC to issue a supplemental EIS, see 40 C.F.R. 1502.9(c)(1).

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exceedance may be effectively mitigated) without potentially necessitating a change in routing of the pipeline. We urge the Commission not to circumvent ODEQ's review that may disclose a potentially significant environmental impact that this draft EIS did not disclose and consider. In short, the Commission's completion of its NEPA process before issuance of the state's necessary authorizations under the CWA, CAA, and CZMA will foreclose the consideration of reasonable alternatives to the proposed action raised as part of, for example, the Department of Land Conservation and Development's consistency review under the CZMA. We urge the Commission to negate the necessity of supplementing its EIS or otherwise violating NEPA by conditionally approving this Project before the relevant state agencies complete their on-going authorization processes.

In light of the Commission's NEPA obligations, the State of Oregon urges the Commission to consider carefully each of Oregon's comments and recommendations and to modify specified sections of the draft EIS to address cited concerns, and where appropriate, to incorporate agency recommendations as required conditions in the Commission's authorizations to support the Commission's conclusion that significant environmental impacts have been reduced to "less-than-significant levels."

Oregon Department of Energy

Siting Division

Contact: Sean Mole, 503-934-4005, sean.mole@oregon.gov

The Oregon Department of Energy expects FERC and the applicant to meet Oregon siting standards found in Oregon Revised Statute and Administrative Rules. These include Oregon's CO2 emissions standards, the provision of a legally enforceable retirement bond for the project, and a comprehensive discussion of, and preparation for, emergency situations that could endanger humans and the environment from construction and operation activities.

Citation	Issue Identification	Recommended Solution
1.5.2.3 p. 1-31	Oregon Energy Facility Siting Council Site Certificate is not listed as a required State permit, prior to construction of the terminal. The applicant had applied for an exemption to Site Certificate as a jurisdictional energy facility, on June 14, 2018.	Include Energy Facility Siting Council Site Certificate as a necessary State Agency Permit and Approval under Oregon Department of Energy, should the applicant propose designed electrical generation components which are EFSC jurisdictional.
2.1.1.5 p. 2-7 Supplemental Resource Report 13 p. 5	Electrical Systems design changes are not addressed in the dEIS. According to Jordan Cove's supplemental Resource Report 13, the facility will reduce its on-site power production by more than 50% (down to 24.4 MW from 50.4 MW). This change is not detailed in the dEIS. Without the detailed engineering description of the power production components, in this case the 3 Steam Turbine Generators, there is uncertainty about whether or not Jordan Cove will require an Oregon Department of Energy Site Certificate. Should the engineering design require components which are subject to Oregon Energy Facility Siting	Include condition requiring the applicant to obtain an EFSC Site Certificate should the final electrical design incorporate jurisdictional components.

	Council jurisdiction, the facility may find itself in violation of ORS 469.320(1) concerning the construction and operation of energy facilities.	
Appendix F.10, 1.6 Termination and Abandonment p. 22	The dEIS describes terms for termination and abandonment of the Pacific Connector Gas Pipeline, but not for the Jordan Cove terminal. The described terms for termination and abandonment do not contemplate involuntary abandonment on the part of the applicant and/or subsequent owners.	Require abandonment planning for the LNG terminal as well as the pipeline. Previous iterations of this project have addressed this issue by entering into an MOU with Oregon Department of Energy which requires the procurement of financial bonds in the amount commensurate with the needs to return the site to its useful, non-hazardous condition, which existed prior to construction. These requirements ensure that taxpayers are not "footing the bill" to acceptably retire these facilities in the event that Pembina is fiscally incapable or otherwise disinclined to do so.

Emergency Preparedness

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EPAct – Section 311: According to the EPAct, the Governor of a state in which an LNG terminal is proposed is to designate an appropriate state agency to consult with the Commission. The state agency should provide the FERC with an advisory report on state and local safety concerns, within 30 days of the FERC's notice of an application for an LNG terminal, for the Commission to consider prior to making a decision.

Designated Authority: In January 2006, Governor Ted Kulongoski designated the Oregon Department of Energy (ODOE) as the lead state agency to: 1) ensure Oregon's interests are protected in the federal siting process of LNG terminals in Oregon, 2) develop LNG emergency preparedness program to protect Oregonians from an LNG incident, and 3) provide safety and security oversight throughout the life of an LNG terminal sited in Oregon.

State Established LNG Emergency Preparedness Standards - Memorandum of Understanding: In 2006, there were five proposed LNG terminals in Oregon. Four terminals were proposed along the Columbia River along with the Jordan Cove Terminal near Coos Bay. Each developer had a different interpretation of what was "adequate" LNG emergency preparedness and the appropriate approach to coordinating with state and local agencies. As a result, ODOE worked with the Governor's Office, Oregon Department of Justice, and the Oregon State Fire Marshall's Office to develop minimum requirements for LNG safety, security, and emergency preparedness and coordination in Oregon. Each LNG developer is required to enter into a Memorandum of Understanding (MOU) with ODOE demonstrating the company's commitment to meet state established standards for LNG security and emergency preparedness at their proposed facility.

Fort Chicago entered into the MOU with ODOE for the Jordan Cove LNG Terminal in February 2009. The MOU was updated under Veresen ownership in June 2014. ODOE is currently working with Pembina to update the MOU for the Jordan Cove LNG Terminal, associated waterway, and pipeline system in 2019.

History of Jordan Cove Safety, Security, and Reliability Coordination: Beginning in April 2006, ODOE began working with Fort Chicago to address the safety, security, and reliability issues involving the proposed Jordan Cove LNG Terminal. Fort Chicago conducted quarterly meetings workshops, training, tabletops, and exercises with federal, state, and local agencies that would be affected by the construction and operation of the Jordan Cove LNG Terminal. This included the U.S. Coast Guard (USCG), ODOE, Oregon State Fire Marshall's Office (OSFM), Oregon State Police (OSP), Port of Coos Bay, Coos County Emergency Management, Coos County Sheriff's Office, Coos County Public Health, city of Coos Bay, city of North Bend, and various local volunteer fire districts.

Fort Chicago conducted quarterly meetings, workshops, training, tabletops, and exercises to identify and vet risks, response measures, resource needs, and coordination protocols among the agencies and Fort Chicago in response to LNG incident scenarios at the proposed Jordan Cove LNG Terminal. After three years of coordination and collaboration, the December 2009 Jordan Cove Emergency Response Plan (ERP) and Resource List identifying gaps required to implement the ERP were developed. The Jordan Cove ERP and Resource List were approved unanimously in concept by the state, local emergency response organizations, and USCG on the condition that the 2009 draft ERP and Resource List would be working documents and updated as needed. An approved Jordan Cove ERP and the Resource List are essential to the development of a Cost Share Agreement between Jordan Cove and impacted state and local agencies as required by FERC.
Developers Fort Chicago and then Veresen continued to work collaboratively with federal, state and local agencies to revise and refine the Jordan Cove ERP and Resource List.

Current Evaluation of Jordan Cove Safety, Security and Reliability Coordination: Safety, security, and reliability coordination for the Jordan Cove LNG Terminal stalled significantly in May 2017 under new Jordan Cove owner Pembina. Pembina proposed a new Jordan Cove ERP, which resembled a template oil spill response plan, without consultation with key federal, state, and local agencies dismissing more than 10 years of work collaboration amongst all entities. This ERP was unanimously rejected by federal, state, and local agencies, which Pembina rescinded.

After a rough start and staff re-organization, Pembina reset its approach and are taking initial steps to get back on track. This includes working with ODOE to: 1) update the original Jordan Cove ERP for review by all agencies; 2) update the Jordan Cove MOU on LNG safety, security, and emergency preparedness for the terminal and waterway; and 3) develop a MOU on safety, security, and emergency preparedness along the pipeline. In addition, Pembina provided ODOE an assurance letter committing to work with all key federal, state, and local agencies on safety, security and emergency preparedness planning and coordination involving the terminal, waterway, and pipeline.

However, much work remains for Pembina to regain the momentum lost over the last two years. Pembina must reinstate the quarterly planning and coordination meetings and re-engage with key federal, state, and local emergency response agencies that have been a part of the project safety, security, and emergency response planning process for over a decade. In addition to ODOE, this includes the U.S. Coast Guard (USCG) Sector Columbia River, USCG Sector North Bend, Oregon State Fire Marshal's Office, Oregon State Police (OSP), Oregon State Marine Board, Port of Coos Bay, Coos Bay Sheriff's Office, Coos County Emergency Management, Coos County Public Health, Bay Area Hospital, Southwestern Oregon Community College, City of Coos Bay Police and Fire, City of North Bend Police and Fire, Charleston Fire, North Bay Fire, and Hauser Fire. This team of agencies

have been meeting quarterly on Jordan Cove safety, security, and emergency preparedness planning and coordination since April 2006.

Pembina will also need to re-engage and re-establish planning and coordination meetings with key agencies along the pipeline route. This includes, but is not limited to Bureau of Land Management, U.S. Forest Service, ODOE, OSP, Oregon Department of Forestry, and local emergency management agencies and sheriff offices in Coos, Douglas, Jackson, and Klamath counties.

State Advisory Report and DEIS Safety, Security, and Reliability Concerns: The following comments address ODOE's safety and security issues for the State Advisory Report and specific DEIS comments on ODOE's safety, security, and reliability concerns for the Jordan Cove LNG terminal, waterway, and pipeline.

Overarching Concerns:

- Issue 1 – Pembina has not provided a construction phase emergency response plan or security plan for the terminal, waterway, and pipeline. This includes strategies to address the workforce population and housing. Project construction activities directly impact federal, state, and local emergency management and law enforcement agencies tasked with ensuring public safety and security in Coos, Douglas, Jackson, and Klamath counties.

  Recommended Resolution – As a condition of the certificate, require the applicant to provide federal, state, and local agencies a construction ERP and security plan for review, approval, and coordination prior to initial site preparation. Also as a condition of the certificate, require Pembina to enter into a Cost-Sharing Plan that contains a description of any direct cost reimbursements to each state and local agency with responsibility for security and safety during the construction of the LNG terminal, associated waterway, and pipeline system.

- Issue 2 – To protect public health and safety and ensure the safe and secure construction and operation of the Jordan Cove LNG terminal, waterway, and pipeline requires the full participation and coordination of federal, state, and local law enforcement, fire service, and emergency managements agencies with legal jurisdiction (USCG NVIC 01-2011). Pembina recently suspended funding to the Coos County Sheriff's Office (SO) preventing the SO from participating in Jordan Cove emergency planning activities. ODOE strongly encouraged Pembina to re-engage the Coos County SO. There is currently no resolution. The SO is the key local law enforcement agency with legal jurisdiction over the proposed Jordan Cove terminal, waterway, and the 46 mile section of the pipeline in Coos County. As a result, the participation of the Coos County SO is required to complete the development and implementation of the following documents: 1) Jordan Cove Emergency Response Plan (ERP), 2) Facility Security Plan, 3) LNG Carrier Transit Management Plan, and 4) Pipeline ERP and Security Plan.

  Recommended Resolution – As a condition of the certificate, require the applicant to enter into a Cost-Sharing Plan that contains a description of any direct cost reimbursements to each state and local agency with responsibility for security and safety at the LNG terminal and in proximity to LNG marine vessels that serve the facility as required by the natural gas act.

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Specific Concerns:

Citation	Issue Identification	Recommended Resolution
Executive Summary, Conclusions, 1st Paragraph, Page ES-5	The DEIS concludes that constructing the Project would temporarily but significantly impact housing in Coos Bay. Issue: Impact to housing from construction would not only significantly impact house in Coos Bay, but North Bend, Charleston, and other nearby communities as well as the housing and campgrounds in Coos County.	Include language in the DEIS that accurately reflects the housing impacts. The DEIS should state that "constructing the Project would temporarily but significantly impact housing in Coos Bay, North Bend, Charleston, and surrounding cities. This includes housing and campgrounds in Coos County.
1.0 Introduction, 1.5 Permits, Approvals, and Consultations, Table 1.5.1-1, Page 1-23	Table 1.5.1-1 references ODOE's authority to furnish an advisory report on state safety and security issues to FERC regarding the Jordan Cove LNG terminal proposal and conduct safe operational safety inspections if the facility is approved and built. Issue: Table 1.5.1-1 does not include the state's minimum standards established for LNG safety, security, and emergency preparedness in Oregon at proposed LNG terminals, associated waterways, and pipeline systems. The state established standards were established by ODOE in consultation with the Governor's Office, the Oregon Department of Justice, and the Oregon State Fire Marshal's Office. As lead state agency designated by the Governor to oversee the safety, security, and emergency preparedness of the Jordan Cove LNG Terminal, associated waterway, and pipeline system throughout the operational life of the project, ODOE requires all applicants to enter into an Memorandum of Understanding (MOU) to meet the state established minimum standards for LNG safety, security, and emergency preparedness.	Include the following language to Table 1.5.1-1: - State established minimum standards for LNG safety, security, and emergency preparedness to "Authority/Regulation/Permit." - ODOE requires all applicants to enter into an MOU to meet state established minimum standards for LNG safety, security, and emergency preparedness to "Agency Action." - Pending to "Initiation of Consultations and Permit Status As a condition of the certificate, require the applicant to enter into an MOU with ODOE to meet state established minimum standards for safety, security and emergency preparedness for the Jordan Cove LNG Terminal, associated waterway, and pipeline system.
1.0 Introduction, 1.5.2.3 Oregon Department of Energy, Pages 1-31	The DEIS states that ODOE has been designated by the Governor of Oregon as the lead state agency to coordinate the review of proposed LNG projects by other state agencies and consult with FERC. Issue: The DEIS does not include ODOE's authority as lead state agency to provide oversight on all aspects of the development and implementation	Include language in section 1.5.2.3 that states "As lead state agency, ODOE provides oversight on all aspects of the development and implementation of safety, security, and emergency response plans and strategies of the proposed projects throughout the federal application process to the end of the

	of safety, security, and emergency response plans and strategies throughout the federal application process to the end of the operational life of the LNG terminal should FERC authorize the project. The DEIS does not include the state's minimum standards established for LNG safety, security, and emergency preparedness in Oregon at proposed LNG terminals, associated waterways, and pipeline systems. The state established standards were established by ODE in consultation with the Governor's Office, the Oregon Department of Justice, and the Oregon State Fire Marshal's Office. As lead state agency designated by the Governor to oversee the safety, security, and emergency preparedness of the Jordan Cove LNG Terminal, associated waterway, and pipeline system throughout the operational life of the project, ODOE requires all applicants to enter into an Memorandum of Understanding (MOU) to meet the state established minimum standards for LNG safety, security, and emergency preparedness.	operational life of the LNG terminal should FERC authorize the project." As a condition of the certificate, require the applicant to enter into an MOU with ODOE to meet state established minimum standards for safety, security and emergency preparedness for the Jordan Cove LNG Terminal, associated waterway, and pipeline system.
2.0 Description of the Proposed Action, 2.1.1.7 Marine Access Facilities, Materials Offloading Facility, Page 2-12	The DEIS states that the Marine Offloading Facility (MOF) would be constructed to receive components of the LNG terminal that are too large or heavy to be delivered by road or rail. The MOF would cover about 3 acres on the southeast side of the slip. Following construction, the MOF would be retained as a permanent feature of the LNG terminal to support maintenance and replacement of large equipment components. Issue: All construction activities, including the transportation of materials and personnel to Jordan Cove, directly impact the safety and security of the public. Jordan Cove has not provided an ERP or security plan for the construction phase for federal, state, and local emergency response agencies review and approval. The ERP and security plan for the construction phase must be validated by and coordinated with federal, state, and local emergency management, law enforcement, fire service, public health, and other key stakeholders tasked with ensuring public health and safety.	As a condition of the certificate, require the applicant to provide an ERP and a security plan for the construction phase prior to initial site preparation. The construction phase ERP and security plan must be coordinated with and approved by federal, state, and local agencies tasked with ensuring public health and safety. This includes a Cost-Sharing Plan identifying federal, state, county, and local resources needed to implement the construction ERP and security plan.
2.0 Description of the Proposed	The DEIS states that Jordan Cove proposes to construct a temporary workforce housing facility	As a condition of the certificate, require the applicant to provide a

Action, 2.1.1.10 Workforce Housing, Page 2-18	within the South Dunes portion of the LNG terminal site that could accommodate common facilities and 200 to 700 beds. Parking would be provided onsite, and shuttle buses would be provided to and from local communities to reduce traffic on the road network after working hours. After completion of construction and commissioning activities the entire facility would be decommissioned and removed from the site. Inadequate to address all of the construction workers required for the project. Issue: The DEIS concludes that constructing the Project would temporarily but significantly impact housing in Coos Bay. (Page ES-5). The workforce housing plan Jordan Cove proposed in this DEIS is inadequate to support the anticipated thousands of construction workers anticipated on site during the height of construction. Jordan Cove needs to provide a comprehensive housing plan that addresses the peak construction workforce and impacts on housing in Coos Bay, North Bend, Charleston, and other nearby communities as well as housing and camp ground in Coos County as a part of the construction phase ERP and security plans. The workforce housing plan and must be reviewed and approved by federal, state, and local agencies tasked with ensuring public health and safety.	comprehensive workforce housing plan that addresses the peak construction workforce and impacts on housing in Coos Bay, North Bend, Charleston, and other nearby communities as well as housing and camp ground in Coos County. The workforce housing plan will be part of ERP and security plans for the construction plan and must be reviewed and approved by federal, state, and local agencies tasked with ensuring public health and safety prior to initial site preparation.
2.0 Description of the Proposed Action, 2.4.1.2 Material Deliveries, Page 2-46	The DEIS states that the transportation of materials, supplies, and staff to the LNG terminal site would be accomplished via a combination of road, marine transport, and rail. Issue: All construction activities including the transportation of materials and personnel to Jordan Cove directly impacts the safety and security of the public. Jordan Cove has not provided an ERP or security plan for the construction phase for federal, state, and local emergency response agencies review and approval. The ERP and security plan for the construction phase must be validated by and coordinated with federal, state, and local emergency management, law enforcement, fire service, public health, and other key stakeholders tasked with ensuring public health and safety.	As a condition of the certificate, require the applicant to provide an ERP and a security plan for the construction phase prior to initial site preparation. The construction phase ERP and security plan must be coordinated with and approved by federal, state, and local agencies tasked with ensuring public health and safety. This includes a Cost-Sharing Plan identifying federal, state, county, and local resources needed to implement the construction ERP and security plan.

Table 2.6.3-1 Pacific Connector's Plan of Development, Appendix C: Blasting Plan, Page 2-68	Table 2.6.3-1 details Pacific Connector's Plan of Development. Appendix C states that the purpose of the Blasting Plan is intended to help ensure the safety of construction personnel, the public, nearby facilities and sensitive resources. Issue: Pacific Connector has not provided a Blasting Plan for federal, state, and local agency review and approval. Blasting hazards directly impact federal, state, and local agencies tasked to ensure public safety and security during the construction of the pipeline. As a result, blasting hazards should be included in the Emergency Response Plan for the pipeline for the construction phase.	As a condition of the certificate, require Pacific Connector to provide an ERP identifying blasting hazards and response measures to ensure the safety of construction personnel, the public, nearby facilities and sensitive resources. The pipeline construction ERP must be completed and provided to federal, state, and local agencies tasked with ensuring public safety and security along the pipeline route for review, approval, and coordination prior to the initial site preparation.
Table 2.6.3-1 Pacific Connector's Plan of Development, Appendix H: Emergency Response Plan, Page 2-69	Table 2.6.3-1 details Pacific Connector's Plan of Development. Appendix H states that the purpose of the Emergency Response Plan is to identify the standards and criteria that Pacific Connector would follow to minimize the hazards during pipeline operation resulting from a gas pipeline emergency in accordance with the Pipeline and Hazardous Materials Safety Administration's regulations in 49 CFR 192.615 and 192.617. Issue: Appendix H does not include an ERP that identifies standards and criteria that Pacific Connector would follow to minimize the hazards during pipeline construction. This includes hazards from blasting, landslides, fires, injuries, safety and security threats to construction workers and the public, and other emergencies threatening public safety and security along the pipeline route. Pacific Connector has not provided a pipeline ERP for construction or operation. Pipeline construction activities directly impact public safety and security. As a result, a comprehensive ERP for construction and operation must be developed and maintained throughout the life of the project in coordination with federal, state, and local agencies tasked with ensuring public safety and security along the pipeline route.	As a condition of the certificate, require Pacific Connector to provide a comprehensive ERP for pipeline construction and operation that identifies all potential hazards and response measures to federal, state, and local agencies tasked with ensuring public safety and security along the pipeline route for review, approval, and coordination prior to the initial site preparation.
Table 2.6.3-1 Pacific Connector's Plan of	Table 2.6.3-1 details Pacific Connector's Plan of Development. Appendix K states that the Fire Prevention and Suppression Plan describes the	As a condition of the certificate, require Pacific Connector to provide an ERP identifying fire hazards and

Development, Appendix K: Fire Prevention and Suppression Plan, Page 2-69	measure to be used by Pacific connector and its contractors to ensure that fire prevention and suppression techniques are carried out in accordance with federal, state, and local regulations. Issue: Pacific Connector has not provided a Fire Prevention and Suppression Plan for federal, state, and local agency review and approval. Fire hazards directly impact federal, state, and local agencies tasked to ensure public safety and security during the construction and operation of the pipeline. As a result, fire hazards should be included in the Emergency Response Plan for the pipeline for construction and operation.	response measures to ensure the safety of construction personnel, the public, nearby facilities and sensitive resources. The pipeline construction ERP must be completed and provided to federal, state, and local agencies tasked with ensuring public safety and security along the pipeline route for review and approval prior to the initial site preparation.
Table 2.6.3-1 Pacific Connector's Plan of Development, Appendix V: Safety and Security Plan, Page 2-70	Table 2.6.3-1 details Pacific Connector's Plan of Development. Appendix V states that the purpose of the Safety and Security Plan is to describe safety standards and practices that would be implemented to minimize health and safety concerns related to the construction of the pipeline project. Issue: Pacific Connector has not provided a Safety and Security Plan for the construction phase for federal, state, and local agency review, approval and coordination.	As a condition of the certificate, require Pacific Connector to provide an ERP identifying fire hazards and response measures to ensure the safety of construction personnel, the public, nearby facilities and sensitive resources. The pipeline construction ERP must be completed and provided to federal, state, and local agencies tasked with ensuring public safety and security along the pipeline route for review and approval prior to the initial site preparation. This includes a Cost-Sharing Plan that contains a description of any direct cost reimbursements to each state and local agency with responsibility for security and safety along the pipeline route.
4.13 Reliability and Safety, 4.13.1 Jordan Cove LNG Project, 4.13.1.1 LNG Facility Reliability, Safety, and Security Regulatory Oversight, Paragraph 3, Pages 4-698 – 4-702	The DEIS states that USDOT has the authority to enforce the federal safety standards for the location, design, installation, construction, inspection, testing, operation, and maintenance of onshore LNG facilities under the Natural Gas Pipeline Safety Act. In an MOU signed with FERC on August 31, 2018, USDOT agreed to issue a Letter of Determination (LOD) stating whether a proposed LNG facility would be capable of complying with location criteria and design standards contained in subpart B of Part 193. The LOD serves as one of the considerations for the	FERC should postpone its decision on whether to authorize or deny Jordan Cove a permit to proceed with construction until USDOT completes and issues its LOD. Upon completion of the LOD, FERC should allow adequate time for federal, state, and local agencies tasked with ensuring public health and safety to review and comment on the LOD prior to issuing the FEIS

	Commission to deliberate in its decision to authorize or deny an application *(Page 4-702, 1st paragraph, last sentence).* Issue: USDOT has yet to issue a LOD. Without USDOT's LOD, crucial reliability and safety information on the potential impacts of the facility design and operation on public health and welfare is unavailable to assist FERC in making a knowledgeable and accountable decision to authorize or deny Jordan Cove's application. In addition, without USDOT's LOD, federal, state and local agencies tasked with ensuring public health and safety are unable to complete a thorough assessment of whether the applicant accurately evaluated the potential incidents and safety measures incorporated in the design or operation of the facility that have direct impact on the safety of plant personnel and the surrounding public. As a result, safety and security strategies identified in the Jordan Cove ERP may not be sufficient	and issuing its decision on whether to authorize or deny a permit on this project. In addition, the incidents and safety measures incorporated in the design or operation of the facility directly impact the safety and security of facility personnel and the surrounding public. As a condition of the certificate, require the applicant to take into account LOD incident scenarios and safety measures in the development and implementation of the ERP and security plans for the Jordan Cove terminal, waterway, and pipeline.
4.13 Reliability and Safety, 4.13.1 Jordan Cove LNG Project, 4.13.1.4 LNG Facility Security Regulatory Requirements, Pages 4-710 – 4-711	The DEIS states that the security requirements for the proposed project are governed by 33 CFR 105, 33 CFR 127, and 49 CFR 193 Subpart J – Security, Title 33 CFR 105, as authorized by the MTSA, requires all terminal owners and operators to submit a Facility Security Assessment (FSA) and a Facility Security Plan (FSP) to the Coast Guard for review and approval before commencement of operations of the proposed Project facilities (page 4-710, first paragraph). Title 49 CFR 193 Subpart J also specific security requirements for the onshore components of LNG terminals, including requirements for conducting security inspections and patrols and liaison with local law enforcement officials (page 4-711, second paragraph). Issue: The DEIS does not include state security requirements identified in the ODOE MOU that the applicant must comply with if the project is authorized and constructed. The applicants FSA and FSP must also be reviewed, approved, and coordinated with federal, state and local law enforcement tasked with ensuring public safety and security for the LNG terminal, waterway, and pipeline.	Include language in section 4.13.1.4 that states the applicant must also comply with state established security requirements for the LNG terminal, waterway, and pipeline for construction and operation. As a condition of the certificate, require the applicant to comply with state established security requirements in the ODOE MOU for the LNG terminal, waterway, and pipeline for construction and operation. As a condition of the certificate, require the applicant to provide a FSA and FSP to federal, state and local law enforcement tasked with ensuring public safety and security for the LNG terminal, waterway, and pipeline. The FSA and FSP must be completed for review, approval, and coordination with law enforcement agencies prior to initial site preparation.

4.13 Reliability and Safety, 4.13.1 Jordan Cove LNG Project, 4.13.1.5 FERC Engineering and Technical Review of the Preliminary Engineering Design, Onsite and Offsite Emergency Response Plan, Page 4-753 – 4 -755	The DEIS states that as part of its application, Jordan Cove indicated that the Project would develop a comprehensive ERP with local, state, and federal agencies and emergency response officials to discuss the Facilities. Jordan Cove would continue these collaborative efforts during the development, design, and construction of the Project (Page 4-753, first paragraph, Onsite and Offsite Emergency Response Plan). The emergency procedures would provide for the protection of personnel and the public as well as the prevention of property damage that may occur as a result of incidents at the Project facilities. Issue: The DEIS only discusses Jordan Cove's intention to continue collaborative efforts with local, state, and federal agencies and emergency response officials during the development, design, and construction of the Project. However, the DEIS does not discuss the ongoing collaboration required with local, state, and federal agencies tasked with ensuring public safety and security during facility operation. The need for safety, security, and emergency response to incidents at the Jordan Cove terminal do not stop at the end of construction, but continues into operation and throughout the life of the project.	Include language in section 4.13.1.5 on the first paragraph under Onsite and Offsite Emergency Response Plan to state "Jordan Cove would continue these collaborative efforts during the development, design, construction, and throughout operations of the Project." As a condition of the certificate, require the applicant to develop and maintain a comprehensive ERP with local, state, and federal agencies tasked with ensuring public safety and security through the life of the project. This includes a Cost-Sharing Plan that contains a description of any direct cost reimbursements to each state and local agency with responsibility for security and safety at the LNG terminal and in proximity to LNG marine vessels that serve the facility, and along the pipeline route.
4.0 Environmental Analysis, 4.1 Geological Resources, 4.1.1 Jordan Cove LNG Project, 4.1.2.3 Seismic and Related Hazards, Page 4-1 – 4-30 November 6, 2017 DOGAMI Letter	ODOE shares the Oregon Department of Geology and Mineral Industries' (DOGAMI) concern regarding the possible deficiencies in the scientific and engineering analyses relating to geologic hazards in the DEIS. With the proposed Jordan Cove LNG Terminal located in the Cascadia tsunami inundation zone, ODOE strongly agrees with DOGAMI that it is critical that all geologic hazards are identified and mitigation measures approved before design and construction to ensure the protection of public health and safety. Issue: Jordan Cove has yet to address the scientific and engineering analyses deficiencies relating to geologic hazards raised in DOGAMI's November 6, 2017 letter. Additional site-specific geologic hazard evaluations to identify accurate risks and proper mitigation measures for the hazards are required to ensure public safety. This	As a condition of the certificate, require the applicant to meet with DOGAMI and ODOE to address and resolve issues raised in the November 6, 2017 letter prior to the end of this draft EIS comment period. As a condition of the certificate, require the applicant to provide the following assessments and hazards analysis prepared by a qualified licensed professional to DOGAMI for review and approval prior to initial site preparation: 1) Probabilistic seismic hazard assessment, which includes the ground motions and duration of

	information is critical for federal, state, and local agencies tasked with protecting public health and safety for the LNG terminal, waterway, and pipeline. The results and findings of these hazards analyses directly impact the planning, development and implementation of response and recovery strategies in the Jordan Cove Emergency Response Plan under development.	shaking for the terminal facilities and entire pipeline route using accurate and up-to-date date methods and data. 2) Comprehensive tsunami hazard analyses for the facility and surrounding areas. 3) Comprehensive liquefaction hazard analysis and mitigation design with supporting data. Comprehensive landslide hazards analysis, which includes co-seismic landslides and lateral spreads for the proposed facilities (including the pipeline) and surroundings.
2.11.1 JCEP-Final Resource Report 11, Page 56	Resource Report 11 (RR11) states that a distant earthquake in Alaska or Japan could result in a tsunami with a relatively long lead-time (12 to 24 hours). RR11 also states that all ships in Coos Bay, including an LNG carrier, would be directed to depart the harbor by the USCG Captain of the Port (COTP). LNG carriers at the LNG Terminal will be facing the basin entrance and Coos Bay and would be adequately manned, as required by the USCG, with the ability to get underway in a short time period while berthed. Therefore, the LNG carriers would be able to depart relatively quickly from the LNG Terminal and head out to sea in the event of a distant tsunami, in response to notice and instructions from the USCG COPT. This amount of time would be adequate for the terminal to stop loading operations and disconnect from the LNG vessel and use two tug boats already in the slip to counteract the forces placed on the LNG carrier hull by the arriving tsunami. If the LNG carrier is traversing in the channel during the tsunami, the tugs would also provide assistance against the force of the tsunami wave coming up the channel. Issue: Both the RR11 or the DEIS fails to sufficiently and accurately identify and mitigate tsunami impacts to the LNG terminal, navigational channel (other vessels and waterway traffic), LNG carrier, and the LNG berth from a Cascadia earthquake. The USCG Waterway Suitability Assessment (WSA) Validation Committee did not address tsunami impacts to	4) As a condition of the certificate, require the applicant to provide for DOGAMI review and approval a comprehensive tsunami hazard analysis, which includes Cascadia tsunami arrival times and distant tsunami hazards. This assessment must address tsunami impacts to the estuarine area surrounding the proposed modifications (e.g., dredged channel, construction modifications), document the analyses, data, assumptions, results, and proposed mitigations. The tsunami analysis is to be prepared by a qualified licensed professional.

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	the LNG terminal, navigational channel, LNG carrier, or the LNG berth because it was beyond the scope of the WSA. DOGAMI established that it would take approximately 25-30 minutes for a large tsunami generated from the Cascadia earthquake to reach Coos Bay following the 3-5 minute shake. Additional site-specific tsunami evaluations to accurately identify risks and proper mitigation measures for tsunamis are required to ensure public safety. This information is critical for federal, state, and local agencies tasked with protecting public health and safety for the LNG terminal, waterway, and pipeline. The results and findings of these hazards analyses directly impact the planning, development and implementation of response and recovery strategies in the Jordan Cove Emergency Response Plan, LNG Carrier Transit Management Plan, and the LNG Carrier Emergency Response Plan under development.	

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Section 1.5.1.6, P. 1-28	DEQ has the authority to approve or deny water quality certifications under section 401 of the CWA.	DEIS Section 5.1.3.2 states "the Project would not result in significant impacts on surface water resources." This conclusion is inaccurate and inconsistent with DEQ's recent review of the proposed project's impacts on state water quality. On May 6, 2019, DEQ denied without prejudice Jordan Cove's request for section 401 water quality certification for the U.S. Army Corps of Engineers' issuance of Clean Water Act Section 404 and RHA Section 10 permits. DEQ found that Jordan Cove failed to provide reasonable assurance that construction and operation of the Project would comply with applicable Oregon water quality standards, as described in the May 6, 2019, Evaluation and Findings Report, which DEQ incorporates in these comments in their entirety by this reference. (See Appendices C and D.) This EIS should be amended to include an accurate representation, analysis and conclusion regarding the direct, indirect, and cumulative impacts of the proposed project, and all similar, connected and cumulative actions, on the water quality of affected State waters.
Section 1.5.1.6	Section 401 of the Clean Water Act bars federal agencies from issuing a license or permit for an action that may result in a discharge to Oregon waters without first obtaining water quality certification from DEQ. DEQ anticipates Jordan Cove's construction and operation of the Project will require authorizations from multiple federal agencies, including but not limited to a Section 404 permit from the U.S. Army Corps of Engineers and authorizations from the Federal Energy Regulatory Commission (FERC) pursuant to the Natural Gas Act.	FERC requires Jordan Cove to apply for and DEQ to approve water quality certification under Section 401 of that Act that the proposed project will comply with Oregon's federally-approved water quality standards.

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4.14.1.2	The DEIS considers the cumulative effects of the Project with other, reasonably foreseeable actions including the Port of Coos Bay's proposed Channel Deepening project. The projects, though proposed separately, are connected and must, therefore, be considered and analyzed as connected actions. The Port of Coos Bay proposes to increase the depth of the channel to -45 feet, the same depth as Jordan Cove's proposed Slip, from the channel entrance to river mile 8.2, just beyond the Jordan Cove LNG Export Terminal. Jordan Cove requires a depth of -45 feet to accommodate the expected class of LNG carriers with a minimum 10-percent under-keel clearance while ships are in dock. Because the draft of these vessels exceeds the present depth of the Federal Navigation Channel, these vessels cannot fully utilize the current channel on all tides.	FERC's EIS must analyze all related actions in this EIS, meaning the cumulative impacts of the proposed project (including alterations to the federal navigation channel), together with the effects of a deepened navigational channel, as connected, similar, and cumulative actions. DEQ understands that the proposed navigational improvements, together with the proposed deepening of the channel will permanently affect water quality parameters including salinity, dissolved oxygen, turbidity, and total dissolved solids. The EIS must analyze the cumulative effects on water quality of changes to the navigation channel resulting from both the Jordan Cove and the Port of Coos Bay Channel Deepening projects.
Executive Summary, p. ES-3	The DEIS states that the pipeline would be located across steep terrain through the Cascade Mountains and planned accordingly. However, the pipeline also crosses the Coast Range with its deep-seated and shallow-seated landslide-prone Tyee Core Area. In its evaluation of Jordan Cove's application for 401 water quality certification, ODEQ presents several concerns with Jordan Cove's landslide hazard assessment in preparation for constructing the pipeline. For example, Jordan Cove did not evaluate the landslide risk associated with the pipeline's construction and operation particularly near headwalls (head scarps) and other unstable slopes. Right-of-way initiated landslides at headwalls connected to bedrock	FERC must address the water quality concerns raised in ODEQ's May 6, 2019 denial without prejudice of Jordan Cove's application for 401 water quality certification. ODEQ evaluated Jordan Cove's landslide hazard assessment in Sections 6.1.2.1, 6.1.2.3, 6.1.2.4, 6.2.2.1, 6.2.2.3, 6.2.2.4, 6.9.2.1, 6.9.2.3, and 6.9.2.4 of Evaluation and Findings Report for ODEQ's 401 water quality certification denial decision. ODEQ's evaluation presented the procedures for a landslide hazard assessment that Jordan Cove should use in the future. Jordan Cove should use Department of Geology and Mineral Industries' protocols to: 1) Identify landslide risks. 2) Identify areas in need of mitigation measures for these risks. To resolve this lack of evaluation criteria and determine the need for mitigation measures, FERC should request that Pacific Connector use the following protocols for landslides developed by

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	hollows and first order streams will violate Oregon sediment and turbidity standards. Given the proposed placement of trench and grading spoils and, potentially, fill placed on the rapidly moving landslide risk area from Pipeline Milepost 8.56 to 8.75, ODEQ reviewed Table B-3a in Resource Report 6 as a quality assurance check on Jordan Cove's Phase I landslide hazard evaluation. Table B-3a summarizes the sites investigated in Jordan Cove's Phase II field reconnaissance. In its review of this table, ODEQ determined that Jordan Cove did not include the area from between Milepost 8.56 to 8.75 in its field data collection and risk assessment. Jordan Cove also did not conduct a surface reconnaissance for the areas of concern featured in Figures 6 and 7. Given this, ODEQ referenced the methodology for identifying moderate and high rapidly moving landslide risks in Resource Report 6 as described below. On Page 31 in Section 4.5.3.2 of Resource Report 6 (Geologic Resources), Jordan Cove indicates it used LiDAR, 10-meter DEM, and aerial photography to identify moderate and high RML sites. This section in Resource Report 6 provides the risk criteria Jordan Cove used to identify the RML sites selected for surface reconnaissance and included in Table B-3a. Jordan Cove's selection criteria were to identify the potential for a RML to induce strain on the pipeline and for RML erosion to expose a pipeline. These two selection criteria would not ensure the identification of RML sites posing a risk to streams and water quality. The above quality assurance check confirmed ODEQ's concerns	DOGAMI: 1. Special Paper 42 (2009) – Protocol for Inventory Mapping of Landslide Deposits from Light Detection and Ranging (LiDAR) Imagery (https://www.oregongeology.org/pubs/sp/p-SP-42.htm) 2. Special Paper 45 (2012) – Protocol for Shallow-Landslide Susceptibility Mapping (https://www.oregongeology.org/pubs/sp/p-SP-45.htm) 3. Special Paper 48 (2016) – Protocol for Deep Landslide Susceptibility Mapping (https://www.oregongeology.org/pubs/sp/p-SP-48.htm) DOGAMI considers the method outlined in Special Paper 42 as the state-of-practice method. Special Paper's 45 and 48 present methods for determining shallow and deep landslide susceptibility, respectively. Jordan Cove's states that it used DOGAMI's state-of-practice method citing DOGAMI's 2002 "Text to Accompany Hazard Map of Potential Rapidly Moving Landslides in Western Oregon" by Hofmeister, Miller, Mills, and Beier. This 2002 document is an introduction to the risks of rapidly moving landslide hazards in Oregon and not a substitute for DOGAMI's SP-42 (2009), SP-45 (2012), and SP-48 (2016) noted above.

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	presented in the December 20, 2018 Supplemental Information Request that Pacific Connector's landslide hazard evaluation did not consider the landslide hazard risks to streams initiated by the construction and operational right-of-way.	
Section 2.3.2.1, Access Roads, P. 2-41 Section 4.3.2.2, Page 4-103	The DEIS erroneously concludes that only 21 existing road segments related to the pipeline project could potentially deliver sediment to streams. In its evaluation of Jordan Cove's application for 401 water quality certification, ODEQ presented several issues with Jordan Cove's analysis of road segments with the potential to deliver sediment to streams. Jordan Cove's assessment grossly underestimates the expected sediment discharge from the use of several hundred miles of unpaved existing access roads. For example, Jordan Cove proposes to use the Washington Road Surface Erosion Model to identify roads hydrologically connected to streams. However, in its analysis, Jordan Cove uses WARSEM incorrectly. ODEQ informed Jordan Cove that it needed to perform a field inventory not a desktop inventory of all roads segments to identify those hydrologically connected to streams. Jordan Cove attempted to identify road segments hydrologically connected to streams using maps during its desktop analysis. In Table 2 of the WARSEM Manual, the authors of this model clearly indicate that a determination of hydrologic connectivity requires field verification. As a result, ODEQ requested a Level IV Inventory using WARSEM as this allows Jordan Cove to document the erosion reduction from road surfaces using Jordan Cove's maintenance and	FERC must ensure that Jordan Cove's methods used to identify unpaved road segments that are likely to be hydrologically connected to streams are reasonably accurate. Please refer to ODEQ's May 6, 2019 denial without prejudice of Jordan Cove's application for 401 water quality certification. ODEQ evaluated Jordan Cove's assessment of existing access roads and their potential to discharge sediment to streams in Sections 6.1.2.3, 6.2.2.3, and 6.9.2.3 of the Evaluation and Findings Report for its decision on the 401 certification. In its evaluation, ODEQ identifies several deficiencies in Jordan Cove's application of the Washington Road Surface Evaluation Model that contribute to Jordan Cove's gross underestimation of road segment hydrologic connectivity and the need for existing access road improvements and maintenance to protect water quality.

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	improvement plan. Jordan Cove's conclusion that only 21 existing access roads have the potential to discharge sediment to streams is based upon road system surveys using aerial photos, maps, or other remote sensing Tools and generalized assumptions about distance and hydrologic connectivity. Remote sensing tools cannot serve as a substitute for a field inventory as explained below. For example, Pacific Connector cannot determine using maps if the surface of a road segment is out-sloping and, therefore, draining overland via the road's fill slope and undisturbed landscape. In addition, maps do not indicate if the surface of a road segment is in-sloping and draining to a ditch carrying stormwater to a stream over several hundred feet or more downslope from this road segment. Moreover, maps do not indicate if a road surface drains to an in-slope ditch that drains to a cross culvert (or drain) which discharges to a zero order stream connected to a first order stream. Given this, Pacific Connector's desktop analysis of road segments is making significant assumptions that incorporate considerable error into its estimate of the number and location of road segments hydrologically connected to streams.	
Section 2.0, P. 2-1	The DEIS fails to identify actions necessary to fully characterize the scope of the proposed project. 40 CFR 1508.25 requires lead agencies to consider actions that may be connected, cumulative, and/or similar to the proposed activity. This deficiency has direct consequences on the ability of the DEIS to fully consider project alternatives and/or develop appropriate controls to minimize water	FERC must include all actions in the project scope to determine project impacts and identify needed mitigation, including but not limited to: 1) Post-construction stormwater discharge to streams from the permanent pipeline right-of-way carrying sediment discharging to streams (See Section 6.1.2.4 of ODEQ's Evaluation and Findings Report for Jordan Cove's 401 WQC application). 2) Post-construction stormwater discharge at new

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	quality impacts. In its 12/20/18 supplemental request in the Evaluation and Findings Report, ODEQ identifies several actions proposed by Jordan Cove requiring full consideration of project alternatives and/or appropriate controls. ODEQ considered many of these proposed actions in its May 6, 2019 denial without prejudice of Jordan Cove's 401 water quality certification application. For example, ODEQ's evaluation for this denial consider the proposed actions in Sections 6.1.2, 6.2.2, 6.6.2, and 6.9.2. Example actions are briefly highlighted in the column to the right. In its September 7, 2018 Additional Information Request (see Page 6 of 15, Attachment B in the Evaluation and Findings Report), ODEQ also requested information summarizing Jordan Cove's actions relating to Temporary to first avoid riparian impacts. Only if avoidance is not possible, is it appropriate to consider minimization and mitigation of these impacts prior to siting TEWAs and the construction right-of-way parallel to streams. In ODEQ's information request, ODEQ noted it was seeking the location of these riparian impacts and the detailed rationale justifying these impacts. Specifically, ODEQ was seeking information on the specific constraints and operational procedures at each site preventing avoidance or minimization. In January 2019, ODEQ received information from Jordan Cove that the detailed justification for riparian impacts that ODEQ was seeking was in Table A.1-1 of the Department of State Lands and Army Corps of Engineers Joint Permit Application. ODEQ reviewed this information and found that it focuses primarily on wetland	and altered road stream crossings (See Section 6.1.2.4 of ODEQ's Evaluation and Findings Report for Jordan Cove's 401 WQC application). 3) Sediment discharge from the use of hundreds of unpaved segments of existing road surfaces and roadside ditches during pipeline construction. These segments are hydrologically connected to streams (See Section 6.1.2.4 of ODEQ's Evaluation and Findings Report for Jordan Cove's 401 WQC application). 4) Placement of fill to develop the construction right-of-way and TEWAs on headwalls/unstable slopes such as headwalls along Pipeline Milepost 8.56 to 8.75 as well as numerous other locations (See Section 6.1.2.1 of ODEQ's Evaluation and Findings Report for Jordan Cove's 401 WQC application). 5) Placement of construction overburden (i.e., rock, soil, tree root wads, slash etc.) on TEWA supported by fill placed on headwalls/unstable slope such as headwalls along 8.72 to 8.75 (See Section 6.1.2.1 of ODEQ's Evaluation and Findings Report for Jordan Cove's 401 WQC application). 6) Constructing a 229-mile construction access road to build the pipeline (See Section 6.1.2.1 of ODEQ's Evaluation and Findings Report for Jordan Cove's 401 WQC application). 7) Siting the construction and permanent right-of-way parallel to streams thus reducing effective riparian shade necessary for thermal regulation of streams (See Section 6.6.2.4 of ODEQ's Evaluation and Findings Report for Jordan Cove's 401 WQC application). 8) Construction of a new Temporary Access Road on steep slopes that are a hazard area for rapidly moving landslides such as TAR 101.70 identified in Jordan Cove 401 water quality certification application (see Drawing No. 340.31-Y-Map 14, Sheet 27 and Geologic Hazard Map Figure 22 of 47 and see Section 6.1.2.3 of ODEQ's Evaluation and Findings Report for Jordan Cove's 401 WQC application). 9) Placement of fill above identified landslides (e.g., Landslide 43) when widening Beaver Springs Sp (BLM NonInv 32-2-36.A) 113.66 (see Drawing No. 340.31-Y-Map 14, Sheet 27 and Geologic Hazard Map Figure 25 of 47 and see Section 6.1.2.3 of

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	impacts associated with the siting of a Temporary Extra Work Area rather than riparian impacts and temperature changes in streams. The modification rationale presented in this Table A.1-1 provides no information regarding alternative locations for TEWAs that Jordan Cove considered and provides no detailed explanation why these alternative locations were unsuitable. Moreover, ODEQ cannot determine from the information in Table A.1-1 if riparian impacts from the construction right-of-way are a result of FERC's 15-foot buffer guidelines or some other factor, as the columns of information in this table present only information on the wetlands impacted, Cowardin Type for each wetland impacted, and TEWAs involved in the impact. From Table A.1-1, ODEQ cannot find information on why Pacific Connector could not avoid or minimize impacts to effective shade to streams when siting TEWAs and the construction right-of-way parallel to a stream. Use of FERC's standard 15-foot buffer guidelines conflicts with Oregon's water quality standards in the significant number of areas for the pipeline route where the state's temperature standard is not met. In these areas, Pacific Connector must demonstrate consistency with the surrogate measures for effective stream shade adopted by DEQ in the Rogue TMDL. Moreover, in a late response to an ODEQ information request, Jordan Cove provided information regarding its rationale for not avoiding impacts to effective riparian shade. As a rationale for not avoiding impacts, Jordan Cove uses "emergent pasture vegetation" as a justification for proposing to remove	ODEQ's Evaluation and Findings Report for Jordan Cove's 401 WQC application).

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	effective riparian shade while paralleling a stream. Emergent pasture vegetation is essentially wetlands impacted by agricultural practices. Jordan Cove's goal to avoid causing a loss of wetlands substantially altered by agricultural production is not a lawful basis for instead removing effective riparian shade that is required by Oregon water quality standards during pipeline construction and operation. Wetlands altered by agricultural activity does not take precedence over effective riparian shade in Jordan Cove's alternatives analysis. Moreover, FERC must assure that Jordan Cove does not use a perpendicular approach to a stream crossing as a rationale for reducing effective riparian shade. Jordan Cove can design bends in the pipeline to avoid impacting riparian areas and to ensure a perpendicular stream approach. These two desirable water quality objectives are not mutually exclusive.	
Table 1.5.1-1, P. 1-23 (ODEQ)	The DEIS fails to include the need for Jordan Cove to obtain Oregon's Water Quality Pollution Control Facility (WPCF) Permit for wastewater discharges to land during pipeline construction. The DEIS also fails to indicate that Jordan Cove will need to use an ODEQ-approved septic tank for the guardhouse at the LNG Terminal. Jordan Cove fails to identify the locations where it will dispose putrescible waste (tree stumps, slash, and roots) from construction overburden and seek a permit for this disposal. ODEQ provides the basis for seeking a solid waste disposal permit in 12/20/18 supplemental request (See Pages 54 – 57 of Attachment A in the	FERC must include the following under ODEQ in Table 1.5.1-1: 1) ODEQ has not issued a NPDES 1200-C permit for the terminal or pipeline construction in regards to FERC's description of permit status. 2) Before ODEQ can review 1200-C permit applications, ODEQ needs Jordan Cove to submit complete NPDES 1200-C permit applications for: a. Pipeline construction and associated structures b. Existing access road improvements c. LNG Terminal d. All Off-Site Project Areas associated with Terminal construction and dredging e. Kentuck mitigation site 3) WPCF permit for vehicle and equipment wastewater during pipeline construction. 4) WPCF permit for the hydrostatic test water discharge. 5) WPCF permit for the trench dewatering

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	Evaluation and Findings Report).	discharge. 6) Use an approved septic tank for the LNG Terminal. 7) Construction and Demolition Landfill Permits for several Jordan Cove proposed disposal sites as required Oregon Revised Statute 459.005 through 418.
Section 4.1.3.5, Pages 4-435 to 4-436	Completion of the pipeline project will require amendments to Rogue, Umpqua, and Winema National Forest Land and Resource Management Plans (LRMPs). Jordan Cove seeks amendments to these plans to allow work in restricted riparian corridors, removal of effective shade on perennial streams, and the creation of detrimental soil conditions in riparian areas. Some amendments require reductions in riparian buffer protections. Specifically, Jordan Cove proposes 50-foot setbacks from streams for Temporary Extra Work Areas (P. 28, Section 1.2.1.1 of Resource Report 1, Construction Right-of-Way). Additionally, FERC guidance allows right-of-way riparian impacts within 15-feet of streams. Such limited riparian setbacks result in thermal loading from the loss of riparian shade from Jordan Cove's proposed actions for pipeline construction and operation, and are in conflict with surrogate measures implementing Oregon temperature TMDLs in the Rogue basin. The proposed TEWA and ROW impacts also conflict with key Aquatic Conservation Strategy (ACS) and CWA Section 303 objectives (i.e., temperature standard, Temperature Total Maximum Daily Loads) related to water quality. There are 922.64 acres of TEWAs and, presumably, a portion of these acres will result in the loss of effective riparian shade. At ODEQ's request,	The Northwest Forest Plan (NWFP) Standard and Guideline WR-3 stipulates that Forest Service cannot use mitigation as a substitute for preventing habitat degradation. Moreover, before impacting riparian buffers for TMDLs, ODEQ requires 401 water quality certification applicants to first avoid riparian impacts and, if avoidance is not technically infeasible, then minimize these before moving to mitigation. ODEQ discusses this in Section 6.6.2 of Evaluation and Findings Report for ODEQ's denial without prejudice of Jordan Cove's application for 401 water quality certification. FERC must ensure the EIS considers all reasonable alternatives which eliminate or reduce riparian impacts before considering amendments to existing land and resource management plans to avoid conflicts with Aquatic Conservation Strategy objectives and TMDLs. To avoid these conflicts, FERC must require Jordan Cove to incorporate detailed justifications in Table A.1-1 that identify all physical and/or technical constraints preventing Jordan Cove from locating TEWAs beyond 50 feet from streams for TEWAs and the construction right-of-way beyond 15 feet from streams when paralleling these streams. Moreover, as a rationale for not avoiding impacts, FERC cannot accept Jordan Cove's use of "emergent pasture vegetation" as a justification for proposing to remove effective riparian shade. Emergent pasture vegetation is essentially wetlands impacted by agricultural practices. Jordan Cove's goal to avoid a loss of wetland functions and values substantially altered by agricultural production cannot serve as a legitimate reason for removing effective riparian shade during pipeline construction and operation. Protecting diminished wetland functions and values legally altered by agricultural activity cannot take precedence over protecting effective riparian shade

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	Jordan Cove is currently compiling the proposed impacts from TEWAs and right-of-way construction parallel to streams. In responding to ODEQ's information requests during the review of Jordan Cove's 401 water quality certification application, Jordan Cove states that site-specific justifications for amendments to riparian buffers are in Table A.1-1 of Appendix B to Part 2 of the USACE Joint Permit Application (P. 399). This table lacks the information needed to evaluate Jordan Cove's requests to amend the Forest Service's Land and Resource Management Plans rather than avoid impacting riparian shade in establishing TEWA set-backs. Moreover, as noted in ODEQ's September 7, 2018 Additional Information Request (AIR) and December 20, 2018 Supplemental Request in the Evaluation and Findings Report, amendments to Land and Resource Management Plans will necessitate changes to BLM and Forest Service Water Quality Restoration Plans. BLM and the Forest Service use Water Quality Restoration Plans (WQRPs) to meet TMDLs. ODEQ approves WQRPs for this purpose. Amendments to Land and Resource Management Plans without ODEQ's review and input undermine ODEQ's actions to ensure compliance with TMDLs.	in Jordan Cove's alternatives analysis. Moreover, FERC must assure that Jordan Cove does not use a perpendicular approach to a stream crossing as a rationale for reducing effective riparian shade. Jordan Cove can design bends in its pipeline to avoid removing effective riparian shade when paralleling streams and to ensure a perpendicular stream approach when crossing streams. These two desirable water quality objectives are not mutually exclusive.
Section 2.1.6, Pages 2-35 and 2-36	The DEIS states that Jordan Cove must secure a Right-of-Way (ROW) Grant from the Bureau of Land Management to cross BLM, USDA Forest Service, and Bureau of Reclamation Lands. In its May 6, 2019 denial without prejudice of Jordan Cove's 401 water quality certification, ODEQ evaluated both pipeline construction (see Sections	FERC must ensure that ODEQ evaluates Right-of-Way Grants for Jordan Cove's proposed pipeline construction and operation activities. This evaluation will ensure these grants incorporate the information presented in Section 2.1.6 of the DEIS such as "stipulations, project design features and mitigation." ODEQ's evaluation will ensure compliance with applicable water quality standards.

Citation	Issue Identification	Recommended Resolution
	6.1.2.1, 6.2.2.1, 6.6.2.1, and 6.9.2.1) and the permanent pipeline right-of-way (see Sections 6.1.2.4, 6.2.2.4, 6.6.2.4, and 6.9.2.4) in its Evaluation and Finding Report for this denial decision. In this evaluation, ODEQ detailed the deficiencies in Jordan Cove's proposed plans and best management practices for pipeline construction and operation. For example, in the December 20, 2018 supplemental request in the Evaluation and Findings Report, ODEQ provided Jordan Cove with the basis for ODEQ's concerns about slope stability along the construction and operational right-of-way. ODEQ's concerns included the potential for pipeline ROW construction and ROW stormwater discharge to initiate landslides (see Pages 68 – 79 of Attachment A). Given its concern about slope stability above zero order streams, ODEQ requested and received in February 2019 the LiDAR shapefiles used in their landslide hazard evaluation. ODEQ performed a preliminary review of the LiDAR maps in a sample section of the Tyee Core Area and found many headwalls in close proximity to the construction and permanent ROW. During this review, ODEQ searched for site-specific geo-engineering measures for fills and cuts on unstable slopes in information provided to-date by Jordan Cove but found this information lacking as noted in ODEQ's December 20, 2018 supplemental information request (see Page 70 – 73 and 75 to 79 of Attachment A in the Evaluation and Findings Report).	Jordan Cove's 401 water quality certification application to ODEQ lacked key project design features to demonstrate Jordan Cove will comply with water quality standards as detailed, for example, in Sections 6.1.2.1 and 6.1.2.4 of ODEQ's Evaluation and Finding Report for the denial decision on Jordan Cove's application. Moreover, Jordan Cove's application lacked a mitigation plan for offsetting the loss of effective riparian shade during construction and operation of the pipeline and associated roadways and work areas as discussed in Sections 6.6.2.1 and 6.6.2.4 of ODEQ's Evaluation and Finding Report.
P. 4-114 & 4-115, Table 4.3.2.2-9	In ODEQ's September 7, 2018 Additional Information Request (AIR), ODEQ determined that Pacific	FERC must direct Pacific Connector to submit a revised Thermal Impact Assessment that includes an evaluation of all the impacts from vegetation removal

Citation	Issue Identification	Recommended Resolution
and Section 4.7.3.5, Watersheds Crossed by the Pacific Connector Pipeline Project, P. 4-495 and P. 4-503 (federal lands)	Connector did not consider the following impacts: 1) Development of the construction and operational right-of-way removing riparian vegetation up to 15 feet from stream based on FERC national guidance. 2) The location of Temporary Extra Work Areas (TEWAs) 50 feet from stream crossings. 3) The location of vegetation clearing associated with new and improved roadways. Pacific Connector has not demonstrated that it first avoided then minimized these impacts before moving to mitigation. Pacific Connector did not provide a detailed justification identifying all the constraints necessitating a move to mitigation of riparian impacts. Pacific Connector only references Table A.1-1 of Appendix B to Part 2 of the USACE Joint Permit Application (P. 399). This table lacks the detailed justification to evaluate the need to amend the Forest Service land management plan rather than avoid riparian impacts when establishing TEWA set-backs. Pacific Connector has not provided a mitigation plan for addressing the loss of riparian shade from ***all aspects of*** pipeline construction and operation. In Sections 6.6.2.1 and 6.6.2.4 of its Evaluation and Findings Report for its denial decision, ODEQ noted Pacific Connector did not provide plans for mitigating the loss of riparian shade and identified the components that Pacific Connector's mitigation plans should contain. Finally, this analysis is not sufficient to determine compliance with Oregon's temperature standard and	from the pipeline right-of-way, associated roadways, and TEWAs and providing a revised mitigation plan addressing unavoidable impacts to riparian shade. As noted above in ODEQ's comment above, FERC must ensure Pacific Connector provides detailed justification for each action to mitigate rather than avoid or minimize the riparian impacts from the development of the construction and operation of roadways, pipeline right-of-way and TEWAs. FERC must consider in the EIS the cumulative thermal impact resulting from shade loss at all stream crossings within each watershed. FERC must consider the proposed loss of effective riparian shade on streams impaired for temperature but not under a TMDL and those subject to OAR 340-041-0028(11). As noted on Pages 65 and 68 of Section 6.6.2 of DEQ's Evaluation and Findings Report for its denial decision without prejudice, the human use allowance in Oregon's temperature standard does not permit a pollution source to cause more warming of a Category 5 stream than allowed under this allowance as stated OAR 340-041-0028(12)(b). Category 5 streams are **impaired** water bodies on the 303(d) list that are not under a Total Maximum Daily Load (TMDL) and therefore have no allocation with a reserve capacity. FERC must analyze and disclose and analyze cumulative effects from all aspects of Jordan Cove's proposed pipeline, and require avoidance, minimization and for any remaining impacts full mitigation within the same subbasin where the thermal impacts would occur.

Citation	Issue Identification	Recommended Resolution
	implementing TMDLs. The DEIS does not consider the cumulative thermal impact resulting from shade loss at all stream crossings within each watershed. The DEIS does not disclose and analyze this cumulative effect analysis.	
Section 2.4.2.1, Cleanup and Permanent Erosion Control, P. 2-57	Jordan Cove proposes to use open trench cutting to create stream crossings for its pipeline. At ODEQ's request, Jordan Cove's 401 WQ certification application proposed an approach to designing and reviewing stream crossings based on: • Castro, J.M., A. MacDonald, L. Lynch, and R. Thorne. 2014. *Risk-Based Approach to Designing and Reviewing Pipeline Stream Crossings to Minimize Impacts to Aquatic Habitats and Species*. River Research and Applications. In its 3/11/19 Additional Information Request in the Evaluation and Findings Report, ODEQ requested that Jordan Cove collect field assessment data that is also consistent with Castro et al. (2014). ODEQ requested that Jordan Cove use the risk based approach presented in Castro et al. (2014). This assessment data is necessary to develop site-specific restoration plans. These field assessments include the documentation and quantification of aquatic habitat units that Jordan Cove's open trench cutting will impact. Jordan Cove's 401 water quality certification application does not contain this information for each stream crossed by open trench cut method. Moreover, Jordan Cove has not developed site-specific restoration plans for all these crossings that use site-specific assessment data.	FERC must request that Jordan Cove collect the field data recommended by Castro et. al. (2014) (see Table 1, Basic Data Needs) during pre-construction surveys of all stream crossings where Jordan Cove will use the open trench cut method. FERC must request that Jordan Cove use the basic data needs noted above to develop site-specific stream restoration plans for ODEQ and other Oregon natural resource agencies to review.
Section 2.4.2.1,	The DEIS states that Jordan Cove will	FERC must correct the discrepancy concerning the

Citation	Issue Identification	Recommended Resolution
Cleanup and Permanent Erosion Control, P. 2-57 and Table 2.4.2.1-1	install permanent erosion control devices consistent with the requirements of Section V.B of FERC's "Plan" as described in Jordan Cove's Erosion Control and Revegetation Plan. Table 2.4.2.1-1 of the DEIS presents spacing requirements that conflict with Section V.B of the FERC's "Plan." In its ECRP, Jordan Cove identifies this "Plan" as FERC's 2013 Upland Erosion Control, Revegetation, and Maintenance Plan. On page 14 of Section V.B, FERC presents slope breaker spacing that conflicts with the spacing in Table 2.4.2.1-1. FERC's requirements specify a spacing of 100 feet on slopes greater than 30%. This spacing will create a larger drainage area for each slope breaker than presented in the DEIS. FERC's required spacing and its drainage area has implications for slope stability as noted in the comments above. FERC's requirements in its 2013 Upland Erosion Control, Revegetation, and Maintenance Plan are part of Jordan Cove's 401 water quality certification application to ODEQ. In Section 6.1.2.4 of the Evaluation and Findings Report for ODEQ's denial decision without prejudice (See Pages 36 and 37), ODEQ evaluated Jordan Cove's slope breakers using FERC's spacing requirements in landslide susceptibility zones. ODEQ's evaluation raised concerns regarding these slope breakers and their potential to initiate landslides in these zones.	permanent slope breaker spacing in the DEIS Table 2.4.2.1-1 and FERC's spacing requirements in Section V.B of the 2013 Upland Erosion Control, revegetation, and Maintenance Plan. FERC must request Jordan Cove propose alternatives to slope breakers for managing stormwater in the construction and operational right-of-way in landslide susceptibility zones given the literature recommending that land managers avoid the discharge of additional water to unstable slopes.
Section 2.1.1.5, Other Terminal Support Systems, Page 2-8 Section 4.3.2.1, Jordan Cove	The DEIS states that Jordan Cove will manage runoff from impervious surfaces within the Terminal and this runoff will be directed to designated areas for disposal. The collection systems for rain in the Terminal are the storm water system and the oily waste system. In its 9/25/18 information	FERC must ensure the design of Jordan Cove's stormwater controls for the Terminal's Construction Facility Areas and the spill containment areas is complete and available for ODEQ's 401 Water Quality Certification Program to review and evaluate if these proposed controls will comply with Oregon's water quality standards.

Citation	Issue Identification	Recommended Resolution
LNG Project, Page 4-83 Section 4.3.2.1, Spills or Leaks of Hazardous Materials, Page 4-87 and 4-88	request in the Evaluation and Findings Report, ODEQ requested changes to and information on the Storm Water Management Plan provided in the Jordan Cove's 401 water quality certification application. Jordan Cove addressed some of ODEQ's concerns. However, ODEQ still has concerns with this plan and detailed information is still lacking, for example, on managing the discharge from Construction Facilities Areas and managing spills from discharging to the oily waste system. These deficiencies were evaluated in Section 6.1.2.5 of the Evaluation and Findings Report for ODEQ's denial without prejudice decision for Jordan Cove's 401 water quality certification application.	
Section 4.3.2.1, Jordan Cove LNG Project, Page 4-83 and 4-84	The DEIS states that dredging activity associated with the Marine Slip, Access Channel, temporary material barge berth, Material Offloading Facility, and marine waterway modifications will create turbidity and sedimentation. In its September 7, 2018 Additional Information Request and December 20, 2018 Supplemental Request in the Evaluation and Findings Report, ODEQ requested a detailed pollution control plan for its dredging activities. As noted in Section 6.1.2.6 of the Evaluation and Findings Reports for ODEQ's denial without prejudice decision, ODEQ did not receive this information prior to the development of the denial decision.	FERC must require Jordan Cove to submit to ODEQ;s 401 Water Quality Certification Program a dredging pollution control plan to determine if these proposed controls will comply with Oregon's water quality standards.
Section 4.2.1.2 Project Specific Soil Limitations P 4-47	The DEIS indicates ODEQ "recommended" a No Further Action determination in 1996 for the Ingram Yard (Terminal Site) and the former Weyerhaeuser Containerboard Mill. ODEQ issued a No Further Action determination in 2006 for both of these cleanup sites.	Change the text to state, that based on the findings of previous environmental investigations, the ODEQ <u>issued</u> a "No Further Action" determination for the former Weyerhaeuser mill site and the LNG terminal site (aka Ingram Yard site).

Table 4.2.1.2-1	Metals natural background concentrations for the Cascade Range Physiographic Province appear to have been incorrectly listed in the table. The cleanup sites that are the focus of this section and table are located in the Coast Range province, and the Coast Range background concentrations should be used.	Revise the table using Coast Range background metals concentrations from ODEQ's Development of Background Metals Concentrations in Soil technical report dated March 2013.
Section 4.2.1.2 Project Specific Soil Limitations Potentially Contaminated Soils and Groundwater 2018 Data Gap Investigation P 4-48	Jordan Cove conducted a Data Gap Investigation on the Containerboard Mill Site in 2018. The DEIS indicates residual contamination remains at levels above ODEQ risk based concentrations (RBCs). However, in ODEQ's review of the Data Gap Investigation, it was pointed out that much of the contamination is deep and not accessible to occupational workers. Only deep excavation work could expose workers to these residual levels of contamination. ODEQ's No Further Action remains in place for this site with the understanding that future deep excavation activities would require extra care to protect workers.	Change the text to state that ODEQ approved the Data Gap Investigation in its letter dated February 12, 2019. If deep excavation work (deeper than 10 feet) is planned, a health and safety plan should be prepared to limit worker exposures and ensure workers are aware of the presence or possible presence of contamination, and steps to take if contamination is encountered.
Section 4.2.2.3 Soil Limitations Jordan Cove Meter Station (MP 0.0) P 4-65	The DEIS references ODEQ No Further Action letter (1996, footnote 62) when describing how clean backfill should be used when filling excavations on this site. The No Further Action letter for the two North Spit sites generally describes how contaminated media should be handled (in accordance with ODEQ rules). The letter does not describe what kind of fill should be used.	The EIS should remove references to ODEQ's Cleanup Program advising or requiring the use of clean backfill when excavations are completed on the site.
Table 1.5.1-1, P. 1-23	The DEIS states that a Title V Acid Rain Permit will be issued.	An Acid Rain Permit is not required for Jordan Cove LNG and will not be issued by ODEQ.
Section 1.5.2.4	The DEIS says that Jordan Cove will be part of the acid rain program.	The Jordan Cove's LNG facility is not subject to ODEQ's acid rain program.

P. 1-31		
Section 4.12.1.1 P. 4-657	The DEIS lists the emissions from the emission units that were in the permit application. The emission units listed includes five combustion turbines, a thermal oxidizer, a boiler, two flares, seven engines, two storage tanks, and fugitive emissions. These emission units could change.	If any of the emission units or number of emission units change, ODEQ' Air Quality Program would need to be notified to update Jordan Cove's application.
Section 4.12.1.1 P. 4-658	Second to last paragraph. The Pacific Connector Pipeline Project, Klamath Compressor Station will not be subject to Prevention of Significant Deterioration (PSD) requirements contained in OAR 340-224-0070.	Correct error. The Pacific Connector Pipeline Project, Klamath Compressor Station will be subject Type B State NSR. [OAR 340-224-0010(2)(d)(B)]
Section 4.12.1.2 P. 4-667	First paragraph. The compressor station location.	Clarify by stating, The compressor station is to be located in an unclassified area, approximately 14 miles to the southeast of the southeast corner of the non-attainment area.
2.1.1.5 Water Systems 4.3.1.1 Groundwater	The Coos Bay-North Bend Water Board (CBNBWB) has 18 groundwater wells located within the Oregon Dunes National Recreation Area (ODNRA) to the north of the LNG terminal. There is a possibility that the water withdrawn from these wells for this project could dry up wetlands or lower water levels in nearby wetlands shallow dunal lakes. The bulk of the water use if related to building the project in the Jordan Cove area.	Correct Reference: Sand Dune Aquifer Groundwater Availability Study. Referenced in Livesay, D., 2006, Jordan Cove Energy Project, Groundwater Review, Groundwater Solutions, Inc., Portland, attached as Appendix E.2 to Resource Report 2 filed with Jordan Cove's May 2013 application to the FERC.
4.1.3.3 Rock sources and disposal sites	Note that "clean fill" as defined in ORS 340-093-030 may be disposed in upland areas without ODEQ approval. However wood waste is putrescible and must be disposed of in a manner consistent with ODEQ solid waste rules	Dispose of all wastes within ODEQ Solid Waste Rules.
4.2.1.2 Potentially Contaminated	"Soils and/or sediments containing residual contamination must be managed and/or disposed in	Any other contaminated soils encountered shall either remain in place under supervision of ODEQ's Cleanup Program or be properly disposed of in

Soils and Groundwater	accordance with ODEQ rules. Per guidance from the ODEQ, Jordan Cove would provide prior notice to the ODEQ when grading or ground disturbance activities are planned to occur on the LNG terminal site."	accordance with ODEQ's solid waste rules. Note – this applies to both the pipeline and the LNG sites.
4.2.1.2 Potentially Contaminated Soils and Groundwater	Similar to the above comment, in the same section of the document. Any wastewater treatment sludges that require removal for structural reasons must be managed in accordance with ODEQ's Solid Waste Rules.	Any wastewater treatment sludges that are removed from the Ingram Yard Site must be properly disposed of in accordance with ODEQ's Solid Waste Rules.
4.2.1.2 Potentially Contaminated Soils and Groundwater	This section discusses removal of boiler ash from the Ingram Yard area.	Per solid waste rules, ODEQ expects industrial derived boiler ash material to be disposed of in a properly designed landfill. Either in a cell of the current permitted landfill on site or an appropriately permitted off-site landfill.
Section 2.4.1.2, p. 2-46 And Section 4.10.1.1, p. 4-622	Operation of the temporary barge berth and storage materials area may require 1200-Z NPDES industrial stormwater general permit coverage, with a Primary Standard Industry Classification (SIC) Code of 44 – Water transportation marine cargo handling.	The EIS should reference the requirement for applicant to apply for and obtain 1200-Z NPDES industrial stormwater general permit coverage with ODEQ.
Section 2.1.1.5, pp. 2-7,8 And Section 4.10.1.1, p. 4-622	The LNG Terminal operation is subject to 1200-Z NPDES industrial stormwater general permit coverage. At a minimum, stormwater exposed to the steam electric power generation activities (Sector O) will require 1200-Z permit coverage. In addition, the primary standard industry classification (SIC) code for the LNG terminal appears to be 44 – water transportation, which also requires 1200-Z permit coverage, as well as any co-located industrial activities at the LNG Terminal site.	The EIS should reference the requirement for applicant to apply for and obtain 1200-Z NPDES industrial stormwater general permit coverage with ODEQ.
Section 2.4.1.1, p. 2-46	A concrete batch plant in a location with the ability to discharge stormwater to surface waters will require 1200-A NPDES stormwater	The EIS should reference the requirement for the concrete batch plant to operate under an ODEQ 1200-A NPDES mining stormwater general permit.

	mining general permit coverage.	
Section 2.1.1.5, p. 2-8 And Section 2.4.1.8, p. 2-51 And Section 2.4.2.1, p. 2-56-57 And Section 4.3.4.2, p. 4-138 Section 4.5.2.2, p. 4-255	Wastewater generated from hydrostatic testing is not an authorized non-stormwater discharge under a 1200-series stormwater permit. The inclusion of a plan to discharge this wastewater to surface waters within an internal management plan, such as the Hydrostatic Test Plan referenced on p. 4-138 is not authorization to discharge this wastewater by Oregon ODEQ.	Ensure all future 1200-series stormwater permit applications and associated stormwater plans clearly describe how this wastewater will be managed and disposed, which may not include discharging to surface waters under a 1200-series stormwater permit.
Section 2.4, p. 2-45	All activities conducted under an ODEQ 1200-series NPDES general stormwater permit must create and implement an acceptable stormwater plan. The 1200-C (construction) must implement an Erosion and Sediment Control Plan (ESCP), and the 1200-Z (industrial) must implement a Stormwater Pollution Control Plan (SWPCP). The DEIS does not reference the requirements of either of these plans, and only references the requirement of a 1200-C permit on p. 4-87 for the construction of the LNG Terminal facility. The existence of other permits or stormwater management plans will not exempt projects from ODEQ's 1200-series NPDES general stormwater permitting requirements.	Apply for and obtain all required 1200-series NPDES general stormwater permits with ODEQ. Complete applications must include complete Erosion and Sediment Control Plans (ESCPs for 1200-C permits) or Stormwater Pollution Control Plans (SWPCPs for 1200-Z permits) that will be reviewed by ODEQ prior to permit assignment.
Section 4.2.2.3, Table 4.2.2.3-2, p. 4-66 And Section	The DEIS only mentions the need for an ODEQ 1200-C NPDES construction stormwater permit for the construction of the LNG Terminal facility on p. 4-87. However, all construction related land	Apply for and obtain all required 1200-C NPDES construction stormwater permit coverage with ODEQ. Complete applications must include complete Erosion and Sediment Control Plans (ESCPs) that will be reviewed by ODEQ prior to permit assignment.

4.3.2.2, p. 4-103, 4-107 And Section 2.4.2.2, p. 2-60 And 2.6.1, p. 2-66 And Section 4.2.2.3, Table 4.2.2.3-2, p. 4-68 And Section 4.5.2.2, p. 4-254 And Table 4.5.1.1-2, p. 4-185 And Section 4.10.2.1, p. 4-627	disturbance, including materials or equipment staging and stockpiling areas that exceeds one acre with the potential for stormwater runoff to enter waters of the state, or that is less than one acre but part of a common plan of development that will exceed one acre (such as the new and expanded access roads), must be conducted under 1200-C permit coverage. The following projects will likely need to be covered by the 1200-C permit: • The 36 potential temporary storage yards (p. 4-66). It is not clear if the staging and spoils storage areas referenced on page 4-107 are considered TEWAs or temporary storage yards, but are also subject to 1200-C coverage. • Access Roads - for all new roads, expansion of roads, anything beyond maintenance of existing road footprint. • The pipeline project. • The LNG Terminal facility. All other project areas identified in Figure 2.1-1 as needed, such as the Park & Ride and housing facility.	
Section 2.6.1, p. 2-66	The 1200-C permit specifies the specific monitoring and inspection frequency of erosion and sediment controls and written documentation requirements. The DEIS indicates monitoring will be at the discretion of contracted environmental inspectors and internal management plans, but does not specify the monitoring requirements of the 1200-C construction stormwater permit or the required erosion control certifications required of inspectors for sites greater than 5 acres.	Apply for and obtain 1200-C permit coverage for all projects as discussed in the above comment.

P. 4-298 - 4-300	Total water used for hydrostatic testing would be about 39 million gallons. Pacific Connector would obtain its hydrostatic test water from commercial or municipal sources or surface water rights owners to lakes, impoundments, and streams from possibly 12 different locations. About half of the water would be from impoundments or lakes, and the rest may come from up to nine streams, including Coos River, East and Middle Fork Coquille Rivers, Olalla Creek, South Umpqua River, Rogue River, Lost River, and Klamath River. Table 4.5.2.3-6 Shows a 35% Flow reduction for the Middle Fork Coquille River during October at the start of coho salmon migration and spawning. ODEQ has concerns that such flow reduction will have impacts to ESA listed salmonid beneficial uses and further limit dissolved oxygen levels in a 303(d) listed MF Coquille River.	Correct deficiency: If dewatering is likely to or is resulting in adverse impacts to waters of the state, the EIS should identify and calculate flow reduction impacts and clearly discuss mitigation efforts to prevent a water quality violation as per the numeric dissolved oxygen standard (OAR 340-041-0016). The dewatering process should be re-evaluated prior to commencement. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.
	ODEQ has concerns about the temperature impacts that may occur due to water withdrawals during low flow periods. ODEQ does not know enough about where these withdrawals will occur to evaluate these potential impacts. Three Oregon Administrative Rules state that no single activity is allowed to increase water temperature by more than 0.3 degrees Celsius (0.5 degree Fahrenheit) above the applicable criteria prior to the development of a Total Maximum Daily Load (TMDL). The Oregon Administrative Rules which place this limit on allowable stream warming are: Anti-degradation rules and policy, 340-041-0004(3)(c),	Correct deficiency: the Appendix M: Hydrostatic Test Plan does not provide enough detail to safeguard that the cumulative impacts of surface withdrawals will not increase water temperature by more than 0.3 degrees Celsius (or lesser amount specified in any applicable TMDL load allocation) above the applicable criteria prior to the development of a Total Maximum Daily Load (TMDL) for the South Coast Basin. Potential temperature impacts must be represented as changes in percent effective shade or actual thermal loads in Kcals/day. Near and long-term impacts must be quantified as requested in ODEQ's September 2011 and September 7, 2018 Additional Information Request which identified deficiencies in the scope of Project activities that could impact effective shade and associated thermal load on streams. ODEQ Recommendation: FERC **not** issue license to

	Protecting Cold Water OAR340-41-0028 (11)(a), Implementation of the Temperature Criteria OAR340-41-0028 (12)(e). Following adoption of a TMDL, particularly temperature TMDLs, the amount of allowable impact may be lower (0.04 degrees Celsius in the Rogue basin, for instance). The DEIS indicates thermal impacts of riparian clearing that are likely to exceed this level in several locations.	Pacific Connector until this deficiency is corrected
P. 4-119, 4-425	"Pacific Connector would prepare and submit to the ODF State Forester for approval a written plan describing how the pipeline would be in compliance with the Forest Practices Act (FPA) (OAR 629-605-0170), prior to harvesting activities."	Correct error: The EIS should identify the specific Oregon FPA stream protection requirements that Pacific Connector must comply with, as these laws implement federal Clean Water Act requirements on non-federal forest lands. Any plans that waive Oregon FPA water quality protections require ODEQ approval.
P. 4-246,	The statement about "typical" Total Suspended Solids (TSS) is unsupported. TSS was calculated based upon a formula derived from a turbidity TSS statistical regression equation based on data from Washington State. ODEQ's has TSS measurements which do not support this statement.	Correct error: TSS modeling was not calibrated upon TSS data. The model calibration might be tested using TSS data. In addition, the TSS turbidity relationship should be derived from paired TSS turbidity data from Coos Bay. The TSS modeling is not applicable as presented in the DEIS. "Background" TSS and turbidities vary based upon precipitation whereas "elevated" TSS and turbidity are "typically" related to rainfall and runoff events or disturbance of bed or banks. ODEQ will base compliance determinations on direct measurements of turbidity rather than through surrogate measures such as TSS. If the applicant resubmits its request for 401 certification, ODEQ will develop conditions to ensure that temporary increases in turbidity do not impair beneficial uses and the EIS should reflect that requirement. If the Commission authorizes the Project, ODEQ is recommending that the following measure be included as specific condition in the Commission's Order. Jordan Cove shall not begin construction until the TSS

		- turbidity statistical relationship is derived from paired TSS turbidity data from Coos Bay. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.
P. 2-58, P. 4-117 P. 4-117	"Pacific Connector would use a standard fertilization rate of 200 pounds per acre bulk triple-16 fertilizer on disturbed areas to be seeded." "Fertilizer would not be used in wetlands unless required by the land-managing agencies and would not be applied within at least 100 feet of flowing streams that have domestic use or support fisheries and would not be applied during heavy rains or high wind conditions." "No application would occur within 100 feet of flowing water and would be avoided during heavy rain and windy conditions. Aerial broadcast spreaders would only occur with federal land-managing agency approval. Fertilizer would be added directly to hydroseeding slurry." Fertilizer should be applied at agronomic rates according to environmental conditions. The reference to refraining from application during heavy rains (0.3"/hour or greater) does not account for accumulative rainfall, saturation of soils, and the potential for runoff.	Correct deficiency: A rainfall index accounting for previous and predicted rainfall should be developed to guide the application of fertilizer and identified in the DEIS. The EIS should require that fertilizing near intermittent stream channel should be prohibited and identify specific setbacks. Identify conditions that will trigger the evaluation of a site specific buffers to protect water quality (e.g. steep slopes, etc) when applying fertilizers. ODEQ Recommendation: if FERC issues license to Pacific Connector include conditions responding to this issue.
P. 2-71, 4-170, 4-211, 4-303	"Vegetation at aboveground facilities would be periodically maintained using mowing, cutting, trimming and the selective use of herbicides." Pesticide applicators must be in compliance with Oregon Department of Agriculture licensing requirements and	The EIS should identify, discuss and require that Jordan Cove and Pacific Connector secure required licensing and permits for these actions. ODEQ Recommendation: if FERC issues license to Pacific Connector include conditions responding to this issue.

	ODEQ's Pesticide General Permit 2300A (http://www.deq.state.or.us/wq/wqpermit/genpermits.htm) should be secured if permit eligible activities are proposed.	
P. 4-114 P. 4-115	The DEIS does not address the cumulative thermal impacts resulting from shade loss at all stream crossings, adjacent work areas, and temporary and permanent ROW maintenance within each watershed. The DEIS does not disclose and analyze the Project's cumulative thermal load analysis. The DEIS only reports results of temperature modeling using SSTEMP at a subset of stream crossings. The applicant performed a shade assessment and associated cumulative thermal impacts analysis by basin. The results are documented in the Thermal Impacts Assessment Resource Report Appendix Q.2 (August 31, 2017). In ODEQ's September 7, 2018 Additional Information Request, ODEQ identified deficiencies in the scope of Project activities that could impact effective shade and associated thermal load on streams. Table 4.3.2.2-9 while informative for predicted modeled temperatures, does not align with Oregon's water quality standards and TMDLs implementing those standards in areas that are not in attainment. DEQ has adopted TMDLs in the basins impacted by the project that include effective shade as a surrogate measure as provided under EPA regulations (40 CFR 130.2(i)) to address heat loading. Pacific Connector must demonstrate compliance with these measures.	Correct error: The Project's thermal impacts must be represented as changes in percent effective shade or actual thermal loads in Kcals/day. Construction and operational (near and long-term) impacts must be quantified as requested in ODEQ's September 2011 letter. If the Commission authorizes the Project, ODEQ is recommending that the following measure be included as specific condition in the Commission's Order. Jordan Cove and Pacific Connector shall not begin riparian vegetation removal, construction of facilities and/or any staging, storage, or temporary work areas and new or to-be-improved access roads until site-specific riparian management area prescriptions are developed for all Project activities that comply with applicable local, state or federal regulations and are consistent with established natural resource management plans. Those site specific plans will include assessment of effective shade reduction due to short-term and long-term reductions in effective shade at the stream surface. Those estimates will be used in developing riparian shade mitigation plans. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until addressing thermal impacts from shade loss is corrected.

	Potential temperature impacts must be represented as changes in percent effective shade or actual thermal loads in Kcals/day. Near and long-term impacts must be quantified as requested in ODEQ's September 2011 letter and consistent with the information requests in the WQ 401 certification review and evaluation documentation.	
P. 4-21 - 4-22	The DEIS does not clearly identify the mechanism or methods to be used for determining whether a slope failure in proximity to a pipeline construction area is related to the pipeline. The DEIS does not clearly identify how slope failures and/or mass wasting events triggered by pipeline construction will be assessed and mitigated.	Correct deficiency: EIS needs to identify the mechanism and methods for the determination of pipeline related slope failures. Explain how slope failures and/or mass wasting events triggered by pipeline construction will be assessed, avoided, minimized and mitigated to prevent water quality impacts. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.
P. 4-245	"Disturbance to 17 acres of other estuarine habitats (non-eelgrass) would be mitigated with reestablishment of estuarine habitat on about 91 acres of unvegetated mudflats at the Kentuck project site. This mitigation site would re-establish 67 acres of tideland habitat and additional wetland acreage." Both Isthmus and Kentuck Sloughs are water quality limited for dissolved oxygen. Disturbance and Mitigation activities in these areas that have the potential to increase total organic carbon (TOC) or biochemical oxygen demand (BOD) will need to determine the effects of this increased load on water column dissolved oxygen conditions. Dike breeching that allows marine waters to come in contact with high organic matter environment (pasture land) can result in increased loads of oxygen demanding substances.	Correct deficiency: The DEIS indicates that applicant will be opening up an area that was previously diked. The EIS should evaluate and disclose the potential impacts to the environment that would likely result from such an action and recommend appropriate mitigation measures that are enforceable and sufficiently detailed. For example, the paper Biogeochemical Effects of Seawater Restoration to Dike Salt Marshes (1997) indicates that tidal restoration should be conducted gradually and be carefully monitored to prevent large releases of nutrients. FERC should disclose and evaluate whether the proposed mitigation actions in these sloughs will result in negative impacts to water column dissolved oxygen levels, and if so, FERC should recommend controls that will reduce such impacts. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected

P. 4-73, Table 4.2.3.2-1 and P. 4-74	Identifies areas with erodible soils and steep slopes	Correct Deficiency: These areas represent high risk areas for soil erosion and as such will require frequent monitoring of erosion controls. The EIS should identify and discuss a separate monitoring plan specifically for these erosion high risk areas. Erosion controls are expected to need more inspection and maintenance in these areas than controls in other areas. If the Commission authorizes the Project, ODEQ is recommending that the following measure be included as specific condition in the Commission's Order. Jordan Cove and Pacific Connector shall not begin riparian vegetation removal, construction of facilities and/or any staging, storage, or temporary work areas and new or to-be-improved access roads until a statistically valid monitoring plan is developed for a representative range of locations , including ongoing assessment of water quality impacts to ensure project impacts are identified and understood at multiple scales (site and cumulative). The monitoring plan should (a) establish baseline (pre-project) conditions and (b) monitor and report construction and post-project conditions and indicators. ODEQ Recommendation: if FERC issues license to Pacific Connector include response to this issue.
P. 4-246 – 4-247	"Model results for the access channel and slip construction indicate that elevated TSS above background would extend about 0.2 to 0.3 mile beyond the dredge sites during a full tidal cycle with any method considered and would exceed about 500 mg/l for about 0.1 mile. Maximum concentrations outside of the specific dredge location would only occur for about 2 hours or less over the tidal cycle with the plume moving upstream or downstream of the dredge site on flood or ebb tide, respectively." Fecal indicator bacteria can adhere to suspended particles in water which	Correct Deficiency: The potential to increase water column bacteria concentrations in Coos Bay should be evaluated. Shellfish harvesting is especially sensitive to increases in bacteria and potential pathogens. Impacts to commercial, recreational and subsistence shellfish harvesting should be identified along with closure plans if monitoring indicates that elevated bacteria levels are present in the bay during construction activities. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected

	then settle causing an accumulation of bacteria in the bottom sediment (Davies et al., 1995). Numerous studies have found fecal indicator bacteria at greater concentrations in the sediment than in the overlying water in rivers, estuaries and beaches (Stephenson and Rychert, 1982, Struck 1988, Obiri-Danso and Jones, 1999, Byappanahalli, et al. 2003, Whitman and Nevers, 2003). Concentrations in the sediment can range from 10 to 100 times greater than in the overlying water. Resuspension of bottom sediment has been shown to increase in fecal indicator bacteria concentrations in the water column. (Sherer et. al., 1988 and Le Fever and Lewis, 2003).	
P. 2-59 4-114, 4-138, 4-115-116 4-291	In riparian areas, shrubs and trees would be replanted across the right-of-way for a width of 25 feet from the waterbody bank. Within Riparian Reserves, Pacific Connector would replant shrubs and trees to within 100 feet of the ordinary high-water mark (OHWM). A riparian strip at least 25 feet wide on private lands, including widths ranging from 50 to 100 feet on fish-bearing streams as designated for Oregon State Riparian Management Areas, and 100 feet wide on federally managed lands, as measured from the edge of the waterbody, would be permanently revegetated. For private lands, vegetative buffers should be restored to widths equal to or above pre disturbance conditions at each site. Re-vegetation scenarios should be compliant with applicable regulatory mechanisms including the Oregon Forest Practices Act, Oregon Department of Agriculture rules	Correct Deficiency: The EIS should identify and recommend that Pacific Connector comply with current regulatory mechanisms for all Project activities (work areas and rights of way), not just stream crossings, consistent with applicable land use and Designative Management Agency requirements (where TMDLs are issued) unless variance, waiver, or exemption has been granted to appropriately mitigate environmental impacts to an alternate level. In areas with temperature TMDLs, this will normally require replacement of equivalent effective shade losses via replanting. That mitigation needs to occur in physical proximity to the location of impacts. Site-specific riparian management area prescriptions must be developed for all Project activities, not just stream crossings that comply with applicable local, state or federal regulations and are consistent with established natural resource management plans. Those site specific plans must include assessment of effective shade reduction due to short-term and long-term reductions in effective shade at the stream surface. Those estimates must then be used in developing riparian shade mitigation plans. ODEQ Recommendation: FERC **not** issue license to

	relating to agricultural lands, as well as those ordinances implemented by local jurisdictions. For federal lands, The NWFP identifies the riparian management areas as two mature tree heights. The USFS document, Northwest Forest Plan Temperature TMDL Implementation Strategies, 2004, determined that harvest in the secondary tree zone (the second tree height) could result in increases in stream temperatures primarily from the loss of angular canopy density. Impacts to riparian vegetation on federal and non-federal lands should include an assessment of the impacts of riparian removal to a distance of two tree heights.	Pacific Connector until these deficiency are corrected.
General Comment	As per the State's Anti-degradation Rule (Oregon Administrative Rule (OAR) 340-041-0004(7): "Water quality limited waters may not be further degraded except in accordance with section (9)(a)(B), (C) and (D) of this rule." In allowing new or increased discharged loads, the Commission or Department must make the following findings as per rule: (A) The new or increased discharged load will not cause water quality standards to be violated; (B) The action is necessary and benefits of the lowered water quality outweigh the environmental costs of the reduced water quality. (C) The new or increased discharged load will not unacceptably threaten or impair any recognized beneficial uses or adversely affect threatened or endangered species. (D) The new or increased discharged	Correct deficiency: The EIS should fully analyze whether the project can comply with applicable Clean Water Act Antidegradation requirements as set out in 40 CFR 122.4(i), 40 CFR 131.12, OAR 340-041-0004, ODEQ's Antidegradation Policy, Implementation Internal Management Directive for NPDES Permits and Section 401 Water Quality Certifications (March 2001), and EPA's August 8, 2013, Review of Oregon's Antidegradation Internal Management Directive. These antidegradation regulations, rules, and policies require, *inter alia,* maintaining and protecting existing instream uses, protecting and maintaining existing high quality waters unless certain state findings are made, and prohibitions on certain new point source discharges to water quality limited water bodies. The only reference to anti-degradation is provided on page 4-94 in the DEIS and lacks substance or evaluation using the above rules and other guidelines. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.

	load may not be granted if the receiving stream is classified as being water quality limited under sub-section (a) of the definition of "Water Quality Limited" in OAR 340-041-0002. The applicant must demonstrate that these findings are supported in the DEIS.	
General – Table 1.5.1-1 and TABLE 4.4.2-1	The DEIS does not adequately describe the role of Oregon Dept of Agriculture (ODA) and its authority under Oregon Revised Statute 568: Water Quality Management or Agricultural Water Quality Management Area Rules and Plans; see OAR 603 Division 90 & Division 95 pertaining to the regulatory role of the Oregon Dept of Agriculture and implementing OARs to areas affected by the pipeline. ORS 568.900 to 568.933 authorizes the Oregon Department of Agriculture to develop and carry out an agricultural water quality management area plan for agricultural and rural lands where a water quality management plan is required by state or federal law. Under this program, ODA has responsibility for protection of impacts to water quality from for "Agricultural activities" but does not regulate WQ impacts for other activities (commercial ventures, forestry, rural residential, etc.) even if occurring on land zoned for agriculture. These Agricultural Area Rules and Plans have been developed under OAR 603 Divisions 90 & 95 for all of the counties in the pipeline path, including those without TMDLs in place. Therefore, it is important that pipeline construction and operation not negatively impact	The EIS should clearly identify the authority and role of Oregon Department of Agriculture's (ODA) Agricultural Water Quality Management Area Rules and Plans. These Area rules and plans provide the framework for how lands and activities under the jurisdiction of ODA will meet the total maximum daily load (TMDL) requirements. There is brief reference to ODA's regulatory authority in Table 1.5.1-1; however there is no mention of evaluating or managing impacts to water quality associated with agricultural lands. ODEQ Recommendation: if FERC issues license to Pacific Connector include response to this issue.

	implementation of the Area Rules and Plans. The proposed pipeline waterbody crossings and riparian activities would reduce stream-side shade thereby negatively affecting the potential to reach TMDL identified shade targets on private lands supporting agricultural activities. See individual Agricultural Water Quality Management Area Rules and Plans for riparian management goals and requirements at the Oregon Department of Agriculture Water Quality Plans web page: https://www.oregon.gov/ODA/programs/NaturalResources/AgWQ/Pages/AgWQPlans.aspx	
Page 4-114 Table 4.3.2.2-9	The DEIS does not explicitly consider the cumulative thermal impact resulting from shade loss at all stream crossings, adjacent work areas, and permanent ROW maintenance within each watershed. The DEIS does not disclose and analyze the Project's cumulative thermal load analysis. The DEIS only reports results of temperature modeling using SSTEMP at a subset of stream crossings. The applicant performed a shade assessment and associated cumulative thermal impacts analysis by Basin. The results are documented in the Resource report Appendix Q.2 In 9/7/18 Information Request, ODEQ identified deficiencies in the scope of Project activities that could impact effective shade and associated thermal load on streams. Associated with these disturbances to the streams and wetlands themselves, are significant impacts to riparian and	Correct deficiency. The DEIS isolates impacts from the pipeline alone to draw the conclusion that there will be minimal impacts to water quality benefits of shading, etc. The EIS must address the cumulative thermal effects occurring in the areas that will be impacted by pipeline construction and long-term operation. Site-specific riparian management area prescriptions must be developed for all Project activities that comply with applicable local, state or federal regulations and are consistent with established natural resource management plans. Those site specific plans must include assessment of effective shade reduction due to short-term and long-term reductions in effective shade at the stream surface. Those estimates must then be used in developing riparian shade mitigation plans. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.

	wetland vegetation. For instance, most existing riparian trees along the pipeline route will be removed. The DEIS states: "9 linear stream miles of streambank could be affected along the whole Project route (GeoEngineers 2017)." These activities will result in a significant removal of riparian shade. Completed TMDLs identify riparian shade surrogates to meet the thermal load allocations required in the TMDL. Selective replanting is proposed except for areas within 15 feet over the center of the pipeline. Even so, temporal losses of wetland and water quality function will be experienced for 1-3 years for wetland shrubs and up to several decades for trees in forested wetland areas and riparian areas. This riparian vegetation, and in particular trees, is essential to providing water quality and habitat functions. Riparian ecological services - shade to reduce stream temperature, nutrient and pollutant uptake, stormwater treatment and infiltration, and bank stabilization through root structure - will be lost in the impacted areas for years to decades. Although mitigation through replanting lengths are proposed for Riparian Reserve areas, the sensitivity of all riparian areas is not accurately described in the DEIS.	
Page 4-96 Mercury in eroded soils. Page 4-289	The Rogue River has been identified as impaired for mercury based on fish tissue analysis (2012 303(d) list: Category 5 – water quality limited). A TMDL for mercury in the Rogue River will be developed in the future. The Willamette basin TMDLs provided estimates that up to 47% of the mercury entering the Willamette River mainstem is coming from the erosion of	Correct error: Mercury impairments in the Rogue River (River Mile 0-216.8) must be acknowledged in the EIS. FERC should require that all necessary steps be taken to prevent erosion during and after construction are implemented including soils testing and implementing the measures outlined in the Contaminated Substances Discovery Plan where warranted.

	native soils. Willamette Basin Mercury TMDL, 2006 https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Willamette-Basin.aspx The DEIS addresses mercury in isolated areas of East Fork of Cow Creek and in the vicinity of legacy mercury mines only (Page 4-96). Given the high potential for mercury in soils within the Rogue Basin, mercury should be addressed across the proposed pipeline route in the context of erosion prevention/sediment control in the ECRP. The DEIS (page 4-289) states, "With adjacent upland disturbance following the standard ECRP and supplemental erosion control actions, additional site-specific ground cover actions would be taken at this crossing, and upslope potential sediment entry into the stream would be controlled and minimized. Overall, adverse effects on fish from mercury would not occur from Pacific Connector Pipeline" Project actions and construction sites must be stabilized following construction to ensure no erosion occurs with wet weather as per the ECRP. If soils containing high levels of mercury are encountered in the Rogue Basin or other mercury containing areas including the East Fork Cow Creek drainage during Project construction, Pacific Connector must implement the measures outlined in its *Contaminated Substances Discovery Plan*.	ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected
4-27, 4-31-32, 4-297, Table 4.1.2.6-1	As per the DEIS the blasting potential was classified as high for about 100 miles of the proposed pipeline route (4-27). All blasting would be done by	Correct deficiency: The EIS should identify the water quality impacts caused by blasting. The EIS should also disclose that permits from Oregon Department of Fish and Wildlife and coordination

Blasting	licensed contractors under the terms of applicable regulatory requirements. Although there is a discussion of minimizing impacts to wetlands and water wells and springs in the text (pages 4-31-32), there is no discussion of minimizing the impacts to streambeds and stream water quality as a result of blasting. Blasting should be a last resort option which must be thoroughly analyzed regarding potential impacts and damage minimization options. Permits from ODFW and coordination with ODEQ are required for blasting in waters of the state.	with ODEQ are required for blasting in waters of the state. The EIS should discuss measures that will be applied to minimize and mitigate adverse impacts when blasting is determined to be the only option. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.
Section 4.1.2.6. Page 4-32. Impacts to private and public water wells.	The DEIS states "Pacific Connector would request authorization from landowners to test and document the baseline condition, yield, and water quality of any private wells located within 200 feet of the pipeline construction right-of-way. This testing would occur before the pipeline construction starts in the nearby area, and the testing results would be shared with the property owner, if requested. Similar information would be gathered for any public water wells located within 400 feet of the pipeline construction right-of-way. Based on testing results, if it is determined after construction that there has been an impact on groundwater supply (either yield or quality), Pacific Connector would work with the landowner to ensure a temporary supply of water, and, if determined necessary by the landowner, Pacific Connector would provide a permanent water supply." ODEQ recommends that if surface and/or groundwater connectivity extends beyond 400 feet or 2-yr time of travel, whichever is larger, that these	Correct deficiency: ODEQ recommends that if source water impacts have the potential to extend beyond the distances specified in the DEIS that these private and public wells are monitored as well. ODEQ Recommendation: if FERC issues license to Pacific Connector include response to this issue.

	private and public wells are also monitored for impacts.	
P. 4-795 and Table 4.14-2 Cumulative Effects: Water Resources.	P. 4-795 states, "However, based on available information (see table 4.14.-2) and the temporary and localized impacts of the Project on surface waters as described in the preceding environmental analyses, Pacific Connector's use of HDDs to cross major waterbodies, and its implementation of erosion and sediment control measures as well as other impact minimization measures, we conclude that these impacts and the potential impacts of the other projects would result in a cumulative impact; but, this impact would not be significant."	Correct omission: Erosion and sedimentation potential and the associated impacts associated with specific activities are examined on a site-by-site basis, and the EIS must include such an analysis. Oregon's numeric turbidity standard OAR 340-041-0036 and Statewide Narrative Criteria OAR 340-041-0007(11) (see also Prohibited activities in ORS 468B.025(1)(a)) are not to be exceeded at any project site along the pipeline route. No individual actions can exceed water quality standards for sediment or turbidity except where authorized by permit. https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=1458 https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=68690 ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.
P. 2-42, 2-60 Temporary Extra Work Areas	Page 2-42 of the DEIS states that Pacific Connector has identified approximately 920 acres of TEWAs that would be disturbed during construction of the pipeline. All of these areas are considered temporary disturbance and would be restored upon completion of construction. All TEWAs that were forested prior to construction would be replanted with trees. Page 2-60 of the DEIS states that "TEWAs would be located more than 50 feet away from the edge of waterbodies where possible, and Pacific Connector has identified locations where site-specific conditions or other constraints prevent a 50-foot setback (see appendix E)."	Correct error: Eventual re-vegetation and restoration does not obviate the requirement to quantify the cumulative thermal impacts. Since TEWAs will result in the additional disturbance and overstory removal in riparian, the EIS should include an analysis of the thermal impacts of this activity, and quantify those impacts. Those impacts must avoided and minimized to the extent possible, and mitigated where they are unavoidable. Subsequent increases in solar radiation should be included in the solar loading assessment and include these thermal units in thermal mitigation calculations. TEWAs will result in the additional removal of riparian vegetation at pipeline waterbody crossings. FERC must include a requirement that TEWA thermal impacts be quantified and mitigated. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.
P. 4-116	DEIS text on page 4-116 states "To	Correct error: Cumulative thermal impacts need to be

Thermal impact from riparian vegetation removal	minimize the potential effects of pipeline construction on stream temperatures by the removal of riparian vegetation, Pacific Connector has incorporated the following measures into its Project design: narrowing the construction right-of-way at waterbody crossings to 75 feet where feasible based on site-specific topographic conditions; locating TEWAs 50 feet back from waterbody crossings to minimize impacts on riparian vegetation, where feasible; replanting the streambanks after construction to stabilize banks and to re-establish a riparian strip across the right-of-way for a minimum width of 25 feet back from the streambanks; and replanting riparian areas equal to 1:1 ratio to temporary riparian shading vegetation losses and 2:1 ratio for permanent riparian losses from the 30-foot operational easement clearing. Based on these measures and the studies summarized above, we conclude that the construction and operation of the pipeline would have no discernible effect on stream temperature."	assessed as changes in percent effective shade or thermal load. Mitigation will be based upon the increase in thermal units not discernable changes in stream temperature. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.
P. 4-114 & 4-115, Table 4.3.2.2-9 Temperature Impacts Nonpoint Source Load Allocations - Site Specific Effective	The DEIS does not consider the cumulative thermal impact resulting from shade loss at all stream crossings, adjacent work areas, and permanent ROW maintenance within each watershed. The DEIS does not disclose and analyze the Project's cumulative thermal load analysis. The applicant performed a shade assessment and associated cumulative thermal impacts analysis by basin. The results are documented in the Thermal	Correct error: Potential temperature impacts must be represented as calculated changes in percent effective shade or thermal loads in Kcals/day. near and long-term impacts must be quantified as requested in ODEQ's September 2011 letter. If the Commission authorizes the Project, ODEQ is recommending that the following measure be included as specific condition in the Commission's Order. Jordan Cove and Pacific Connector shall not begin riparian vegetation removal, construction of facilities

Shade	Impacts Assessment Resource Report Appendix Q.2 (August 31, 2017). ODEQ's September 2011 letter provided Pacific Connector guidance on using shade as a surrogate for temperature and using methods to estimate long term impacts to shade and subsequently thermal loading to be consistent with the TMDLs approach. In this section, the DEIS only summarizes results of temperature modeling using a model SSTEMP at a subset of stream crossings. While the assessment of measurable temperature impacts to stream segments as a result of specific crossing or action is informative it does not align with Oregon's water quality standard or TMDLs implementing that standard. TMDLs in the basins impacted by the Project use "*other appropriate measures*" (or surrogate measures as provided under EPA regulations (40 CFR 130.2(i))) in the form of percent effective shade to address heat load. Potential impacts to waters of the state by the removal of riparian vegetation should be quantified as loss of effective shade as measured on the streams' surface. As per the temperature TMDLs, attainment of the effective shade surrogate measure is equivalent to attainment of the nonpoint source heat load allocations. System potential vegetation is the typical shade target for streams with no assimilative capacity. System potential vegetation represents the maximum possible effective shade for a given location, assuming the vegetation is fully mature. **Note:** In general the Rogue and Klamath, and Umpqua Basins,	and/or any staging, storage, or temporary work areas and new or to-be-improved access roads until site-specific riparian management area prescriptions are developed for from all Project activities, not just stream crossing that comply with applicable local, state or federal regulations and are consistent with established natural resource management plans. Those site specific plans will include assessment of effective shade reduction due to short-term and long-term reductions in effective shade at the stream surface. Those estimates will be used in developing riparian shade mitigation plans. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected

	temperature TMDLs and associated shade targets apply to all perennial and intermittent streams within the project area. Solar gain and thermal loading are not limited only to 303d listed segments, but are an issue for all perennial and intermittent streams in a TMDL basin. See individual TMDLs for more information: https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLS-Basin-List.aspx	
P. 4-140 Stream Temperature Assessment See also comment 61 P. 4-114 & 4-115, Table 4.3.2.2-9 Temperature Impacts	The DEIS summarizes results of temperature modeling using SSTEMP at a subset of stream crossings. Project-specific temperature modeling that was conducted on federal lands stream crossings using Stream Segment Temperature Model (SSTEMP) (Bartholow 2002), was conducted at the perennial stream crossings on BLM lands at Middle Creek Deep Creek and Big Creek, and NFS lands at multiple crossing on the East Fork Cow Creek in 2009 and again in 2013 to reflect new pipeline alignment and lower flow conditions (NSR 2009, 2015b,c). ODEQs' TMDLs are based on achieving and maintaining site potential vegetation, recognizing that natural disturbance will occur that prevents full potential from being achieved at any given time & location.	Correct deficiency in DEIS: Anthropogenic heating and stream temperature increases above natural rates of heating are a violation of state water quality standards in TMDL basins. Effective shade is the surrogate measure for compliance in these basins. The EIS should clarify that impacts to riparian vegetation must be fully mitigated by offsetting increases in thermal loading by ratios of 1:1 and 2:1. See ODEQ's September 2011 letter to Jordan Cove and Pacific Connector. These mitigation ratios are consistent with ODEQs 2009 Water Quality Trading Internal Management Directive. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected
4-411	Section provides incomplete and inadequate description or analysis of Oregon CZMA/CZARA status. Oregon developed a Coastal Nonpoint Pollution Management Plan (CNPCP) that was finally disapproved by EPA and NOAA in 2015. The primary basis for disapproval is failure to resolve the outstanding management measures for private forestry. Specifically, three areas have	In order to demonstrate that the Project will be consistent with Oregon's existing CNPCP and address outstanding management measures: The EIS will need to address how the Project will ensure that BMPs are implemented to address CNPCP outstanding management measures when conducting operations on private lands. At a minimum, the Project should fully implement practices consistent with those developed under the Oregon Plan (see

	been identified as not met associated with operations on private forest lands (and so-called legacy roads).	Private Forest Landowners and the Oregon Plan (February 2012): https://www.oregon.gov/ODF/Documents/WorkingForests/Oregon_Plan_PFguide.pdf
4.3.1.2 Pacific Connector Pipeline Project p. 4-100: Impacts and Mitigation pp. 4-104 to 4-108: Turbidity and Sedimentation 4-273 to 4-284:	Sources of turbidity and sedimentation and waterbody impacts of these potential characteristics or pollutants are addressed in multiple sections of the DEIS. The DEIS (p 4-273) states "Pipeline crossings of surface waterbodies would cause some downstream turbidity and sedimentation." The DEIS summarizes the evaluation performed by the Project on construction phase impacts of crossings and concludes: "Overall cumulative effects [of sedimentation on aquatic resources] would be unsubstantial based on the dispersed distribution of crossings and magnitude of effects at each and lengths of stream channel potentially affected". ODEQ disagrees with the DEIS' principal conclusion regarding sedimentation. The reasons are that Oregon's Statewide Narrative Criteria In OARs 340-041-0007(7), (8), and (11) and OAR 340-041-0011. **Biocriteria** set forth performance standards that the Project (due to its multiple waterbody intersections in a variety of geographies) cannot demonstrate will be met without site-specific & project-specific monitoring activities that evaluate pre- and post-project conditions of the "Resident Biological Community" (OAR 340-041-0002(50)). Assessing whether there are aquatic life	The EIS must include an analysis of target turbidity values or fine sediment (e.g. TSS) levels and require monitoring to assure that those levels are not exceeded. This must include an assessment of post-construction, operational phase total suspended sediment or turbidity levels in waterbodies hydrologically connected to drainages along the pipeline. The EIS must be based on a statistically valid monitoring plan developed for a representative range of locations, including ongoing assessment of water quality indicators and macroinvertebrate condition, to ensure project impacts are identified and understood at multiple scales (site and cumulative). The monitoring plan must (a) establish baseline (pre-project) conditions & (b) monitor and report construction and post-project conditions and indicators. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected

	impacts from anthropogenic sources of fine sediment is normally based on macroinvertebrate condition (compared to reference or pre- & post-activity). Physical survey methods could be employed to assess whether the standard in OAR 340-041-0007 (11) is met. The discussion of Project effects on sedimentation and turbidity levels are linked to a range of monitoring approaches and their respective effectiveness. Turbidity levels upstream of an activity are generally used to establish the target turbidity value (downstream from an activity) and assess compliance with Oregon's turbidity standard (OAR 340-041-0036). For disturbance associated with construction of stream crossings, assume turbidity is associated primarily with generation and suspension and transport of fine sediment rather than organic matter. Establishing the target turbidity level and assessing compliance with that target depends on the water body conditions at the time of the activity. These levels should be explicitly identified in the joint permit conditions (JPA). For the post-construction, operational phase, no specific estimates of total suspended sediment or turbidity levels was provided. The DEIS largely assumes that full site stabilization will occur in disturbed areas. Follow-up with federal agencies for areas not meeting the ECRP is included, but no post-construction monitoring plan on private	

	lands was identified. In contrast, a channel condition monitoring plan is explained (p. 4-102)	
P. 4-104 Turbidity and Sedimentation	The DEIS discusses several impacts of fine sediment suspension and subsequent deposition. The DEIS does not explicitly address whether the pipeline construction activities and operation will achieve compliance with OAR 340-041-0011-Biocriteria and OAR 340-041-0007 Statewide Narrative Criteria (11) Oregon's sedimentation and biocriteria standards are not explicitly linked to highly variable in-stream turbidity levels but rather are associated with impacts on stream bottom habitat or aquatic life, respectively.	Correct deficiency: The EIS should more effectively address whether the pipeline construction and operation can meet narrative state water quality standards, and if so, what mitigation measures will be needed to meet these standards and monitoring to demonstrate that standards are, in fact, being met as a result of Project activities. See preceding comment above. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected
Stream Temperature pp. 4-114 to 116 p. 4-291;	The DEIS summarizes the riparian setbacks for Project and concludes (p. 4-116): "Based on these measures and the studies summarized above, we conclude that the construction and operation of the pipeline would have no discernible effect on stream temperature." As stated in other comments, ODEQ does not agree with this conclusion for several reasons. First, the DEIS fails to address the primary thermal load surrogate (effective shade) and fails to address thermal load. Second, thermal impacts that exceed OAR 340-041-0028(11) Protecting Cold Water (PCW) criterion have been documented by ODF from harvest using FPA private forest RMAs for small and medium fish-bearing streams (Groom et al 2011; see Board of Forestry Rules analysis).	The EIS should recommend that state forest Riparian standards (for RMAs) be followed. See Forest Management Plans (FMP) [ODF, 2010]) riparian buffers https://www.oregon.gov/ODF/Working/Pages/StateForests.aspx Revise ECRP and other documents accordingly to reflect level of RMA protection needed to meet shade targets and protect cold water on waterbodies where riparian management is conducted on private lands. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected.

	The minimum 25-foot riparian management area (RMA) is not adequate to ensure thermal load reduction and meet TMDL shade targets on small perennial streams or meet OAR 340-041-0028(11). The DEIS also does not describe Oregon's Riparian Protection Rule in sufficient detail to evaluate whether the Project will be in compliance with the FPA where applicable. It can be complex to determine RMA requirements under "alternate practices" likely to be employed for pipeline construction. See Oregon's Forest Protection Laws : An Illustrated Manual -Chapter 2: Planning a timber harvest https://oregonforests.org/pub/oregons-forest-protection-laws-illustrated-manual Finally, in its 9/7/18 information request, ODEQ identified deficiencies in the scope of Project activities that could impact effective shade and associated thermal load on streams.	
p. 4-105 Major Waterbody Crossings	DEIS (4-105) states: "The South Umpqua River diverted open-cut crossing would have similar effects on downstream sediment and turbidity, in the short term, to those from other dry crossings." The DEIS evaluation concluded that turbidity generated during construction may exceed the Oregon water quality standard for short distances and short durations downstream from each crossing. *Further*, "There would be short-term turbidity increases for several hours during portions of the installation and removal of the diversion structures for	The EIS should reflect the need to provide a more robust evaluation of: (a) the amount and characteristics of fine sediment that is expected to be generated, and (b) fate of fine sediment and impacts to aquatic habitat and aquatic life expected to be produced by the pipeline Project under a normal range of environmental scenarios, including discharge and precipitation events. FERC should develop license conditions that would better ensure protection of water quality and aquatic resources If the Commission authorizes the Project, ODEQ is recommending that the following measure be included as specific condition in the Commission's Order.

	the proposed diverted open-cut crossing of the South Umpqua River." ODEQ concludes that the Project expects that turbidity standards will be exceeded for unknown periods of. These exceedences are not authorized. In the South Umpqua sub-basin, there are 22 segments that are Category 5: Water quality limited, 303(d) list, TMDL needed for Biological Criteria. For many of these segments fine sediment has been identified as a significant stressor. The DEIS minimizes adverse downstream impacts of fine sediment deposition on aquatic habitat and aquatic life. Major waterbody crossings are risky. If construction is planned for an unanticipated period of wet flows or heavy precipitation occurs, the Project's response isn't clear. These low frequency - high impact scenarios are not adequately addressed.	Jordan Cove and Pacific Connector shall not begin construction of diverted open-cut crossings until project provides a more robust evaluation of: (a) the amount and characteristics of fine sediment that is expected to be generated, and (b) fate of fine sediment and impacts to aquatic habitat and aquatic life expected to be produced by the pipeline Project under a normal range of environmental scenarios, including discharge and precipitation events. ODEQ Recommendation: FERC **not** issue license to Pacific Connector until this deficiency is corrected
Mitigation on Non-Federal Lands P. 2-36	The DEIS provides a short description on how impacts on non-federal lands will be mitigated. It provides information on plans that are currently being drafted.	Complete plans on mitigation measures on non-federal lands must be included in the EIS.
Environmental Analysis Pipeline: P. 4-71	The Pacific Connector Pipeline Project would likely result in a degraded soil condition on an estimated 30 to 70 percent project right-of-way on NFS lands in the Winema National Forest (all in the Spencer Creek Watershed) due to displacement and compaction (Orton 2009). Compaction can largely be addressed by subsoil ripping, but displacement would be unavoidable because of the nature of the project.	The DEIS provides information on streamside vegetation mitigation. However, due to the unprecedented amount of disturbed land and degraded soil, mitigation measures must be included to minimize sedimentation in the watershed as a result of the degraded soil conditions. Furthermore, efforts will need to be made to revegetate these areas.
Klamath River	Table 4.7.3.5-10 outlines specifics in the	Spencer Creek is the main tributary in the Upper

Basin, Spencer Creek Fifth Field Watershed, HUC 180102206, Winema National Forest P 4-512 to 4-516	Spencer Creek watershed. However, there is no analysis of the sediment listing for Spencer Creek as it pertains to the Clean Water Act. In addition, there is no analysis of impacts to spawning grounds for Redband Trout and no analysis of protections for anadromy.	Klamath River watershed and will host salmonids upon dam removal for spawning purposes. Include protections for sediment loading that will impact both water quality in the watershed and potentially impact spawning habitat for Redband Trout and Salmonids.
Measures That Would Mitigate Effects on Aquatic Resources on Federal Land P. 4-307- 4-308	Mitigation has been mentioned throughout the document in regards to the various impacts related to stream crossings. However, there is little detail on mitigation on non-federal lands.	In areas where the pipeline crosses sensitive streams such as the Spencer Creek, alternative methods for stream crossings must be used to reduce significant impacts to environment. These alternative methods could include horizontal boring or changing the route of the pipeline. Otherwise, the EIS should identify and discuss other specific mitigation measures for water quality improvement projects that will appropriately protect water quality in these sensitive streams. In addition, other areas outside of the federal nexus need to be evaluated. Private lands should have an additional section on how the mitigation practices will work to protect them as well.

Oregon Department of Fish and Wildlife

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The Oregon Department of Fish and Wildlife (ODFW) provides the following comments on the Federal Energy Regulatory Commission's (FERC) 2019 Draft Environmental Impact Statement (DEIS) for the Jordan Cove LNG Terminal and Pacific Connector Pipeline Projects (JCEP/PCGP) in the state of Oregon (FERC Docket No. CP17-494-000 and CP17-495-000). The DEIS was published in March 2019 by FERC and its Cooperating Agencies (US Bureau of Land Management – BLM, US Forest Service – USFS, US Fish and Wildlife Service – USFWS, US Army Corps of Engineers – USACE, National Oceanic and Atmospheric Administration's National Marine Fisheries Service – NMFS, US Coast Guard, Coquille Indian Tribe, and the Pipeline and Hazardous Material Safety Administration).

These comments are a compilation of ODFW comments over the 11-year history of the JCEP/PCGP project, including ODFW comments on the FERC Notices of Intent (NOI; 2008, 2012, 2017), Draft Environmental Impact Statements (DEIS 2015, 2019), as well as comments submitted to USACE and state permitting agencies over the years. All comments reflect careful long-term refinement and assessment by ODFW, but are lengthy due to the extended history of the proposed project and its widespread impacts. ODFW has reviewed and updated previous comments that remained fully relevant. Where the project actions have changed or new information was available, ODFW has modified or added comments that reflect these aspects.

ODFW provides the following comments aimed at the sufficiency of the DEIS in its consideration of impacts to fish, wildlife, and their habitats, as guided by the implementing regulations for NEPA documents at 40 C.F.R Part 1502 and 18 C.F.R. Part 380. ODFW comments are also submitted under provisions of the Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-667e; the Act of March 10, 1934; Ch. 55; 48 Stat. 401) which, as amended in 1946, requires consultation with the Fish and Wildlife Service and the fish and wildlife agencies of States where the "*waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified*" by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources" and to allow FERC and its Cooperating Agencies to consider state fish and wildlife agencies concerns.

Relevant ODFW Authorities:

ODFW recommendations on the JCEP/PCGP project are guided by the following statutes, rules, and plans. *(An asterisk (*) indicates those authorities also listed as Enforceable Policies for the Jordan Cove Energy Project by ODFW of Land Conservation and Development Oregon Coastal Management Program for their Federal Consistency determination, pursuant to Section 307(c)(3)(A) of the Coastal Zone Management Act.)*

- Wildlife Policy (ORS 496.012*): Establishes wildlife management policy to prevent serious depletion of any indigenous species and maintain all species of fish and wildlife at optimum levels for future generations.
- Threatened or Endangered Wildlife Species Protection and Conservation Programs (ORS 496.171-182*): Authorizes ODFW to develop conservation and recovery plans for listed wildlife species, including guidelines that it considers necessary to ensure the survival of individual members of the species. These guidelines may include take avoidance and protecting resources sites such as spawning beds, nest sites, nesting colonies, or other sites critical to the survival of individual members of the species (496.182(2)(a). Directs state land management agencies to work with ODFW to determine their agency's role in conservation of endangered and threatened species. At ORS 498.026(1), prohibits "taking" of any listed species. Illegal take is a violation of the wildlife laws, subject to criminal prosecution as a Class A misdemeanor or violation pursuant to ORS 496.992.
- Prohibition of harassment, etc. of wildlife (ORS 498.006): Prohibits chasing, harassment, molestation, worrying or disturbing any wildlife, except as the Fish and Wildlife Commission may allow by rule.
- Criminal penalties for wildlife violations (ORS 496.992): Makes violation of any wildlife statute or Fish and Wildlife Commission rule subject to prosecution as a Class A misdemeanor or violation.
- Food Fish Management Policy (ORS 506.109*): Establishes production, utilization, and conservation goals for food fish to provide optimum economic, commercial, recreational, and aesthetic benefits for present and future generation for the citizens of this state.
- In-Water Blasting (ORS 509.140*): Any entity that desires to use explosives or any substances deleterious to fish for the construction of a dam, bridge, or other structure shall make application to the State Fish and Wildlife Commission for a permit to use explosives in such waters. This statute also creates the authority for ODFW designation of in-water work windows (time periods appropriate for working within fish-bearing waters).
- ODFW Fish Passage Law (ORS 509.580 - 509.645*): Requires upstream and downstream passage at all artificial obstructions in those Oregon waters in which migratory native fish are currently or have historically been present.
- ODFW Fish Screening Policy (ORS 498.301*): Prevents appreciable damage to game and nongame fish populations as a result of the diversion of water for nonhydroelectric purposes from any body of water in this state.
- Fish and Wildlife Habitat Mitigation Rule (OAR 635-415-0000-0025): Governs ODFW's provision of biological advice and recommendations concerning mitigation for losses of fish and wildlife habitat caused by development actions. Follows a mitigation hierarchy of avoid, minimize, and mitigate impacts to fish and wildlife habitat. Goals of the policy include no loss, no net loss, and net benefit depending on the category of habitat impacted. This rule is the framework ODFW uses to implement ORS 496.012, 506.109, 496.182, 509.140, and 509.180, among other statutes.
- General Fish Management Goals (OAR 635-007-0510): Establishes the goals that fish be managed to take full advantage of the productive capacity of natural habitats, and that ODFW address losses in fish productivity due to habitat degradation through habitat restoration.

General Comments and High Priority Issues

This narrative section highlights ODFW's primary concerns with the JCEP/PCGP project, and focuses on the key areas of the DEIS that did not sufficiently demonstrate how serious depletion of Oregon's fish and wildlife resources will be avoided (ORS 496.012). By way of summary, those key areas of insufficiency include:

- The need for a Natural Resource Technical Advisory Group
- Economic Impact
- Connection to Port of Coos Bay Channel Modification Project and their Cumulative Effects
- JCEP LNG Terminal Impacts to the Coos Bay Estuary
- Dredging Impacts to Estuarine Habitats and Communities
- Impacts to Eelgrass
- Introduction of Non-indigenous Species through Ballast Discharge
- Disturbance to Marine Mammals
- Impacts to Wildlife in Freshwater Wetlands, Uplands, and Beaches on the North Spit
- Impacts of the LNG Terminal on Snowy Plover Nesting and Foraging Habitat
- Impacts to Coastal Marten Habitat
- Habitat Loss at the JCEP LNG Terminal Site
- Impacts from the PCGP Pipeline to Fish and Wildlife Habitat
- Impacts to Marbled Murrelet and Northern Spotted Owl Habitat
- Fish and Wildlife Habitat Mitigation
- Fish Passage
- In-Water Blasting, In-Water Work.

Each of these bulleted issues is discussed in detail below.

Natural Resource Technical Advisory Group – ODFW recommends FERC and/or JCEP/PCGP create a Natural Resource Technical Advisory Group (NRTAG) to serve as a technical team to minimize environmental impacts and oversee the comprehensive mitigation plan (mentioned in Section 4.5.1.1 on Page 4-186). A Natural Resource Technical Advisory Group could include the Applicant, and natural resource knowledgeable professionals. ODFW recommends the NRTAG be comprised of members from federal agencies, tribes, state agencies, science-based organizations, and other stakeholders. The role of the NRTAG would be to assist project managers with project planning, adaptive management, and implementation assuming FERC authorization. The NRTAG could interact with FERC and JCEP/PCGP to provide specific guidance/feedback, evaluation of potential ecological impacts risks, needed monitoring/studies, and post-study ecological assessment relating to:

- Direct and indirect construction impacts of the project.
- Post-construction legacy impacts to fish and wildlife production.
- Precise methods of study to determine/measure the magnitude of both project impacts and restoration/mitigation effectiveness.
- Mitigation strategies, and monitoring of mitigation to ensure effectiveness.

Economic Impact - ODFW recognizes the project is anticipated to provide immediate economic benefits to the local communities of Coos County and other counties within the range of the pipeline portion of the project. However, this benefit should be evaluated in the context of both the potential adverse environmental effects and negative impacts to the long-standing current and future economically important industries (e.g. commercial fishing, recreational fishing and hunting, aesthetics, wildlife viewing, and aquaculture) that depend on healthy and abundant fish, wildlife, and habitats. Section 4.9 of the DEIS briefly discusses the potential impacts to commercial and recreational fishing and its contribution to the economy. However, ODFW contends the DEIS's discussion grossly underestimates the impact. Fish and wildlife recreational expenditures in 2008 accounted for $2.5 billion in income for the state of Oregon (Runyan and Associates 2009). In Oregon, the commercial crabbing fishery is a tremendous economic engine with potential to be impacted by this project. For example, the 2017-2018 Dungeness crab season (December to August) generated $74 million in ex-vessel value (see https://www.dfw.state.or.us/MRP/shellfish/commercial/crab/docs/Crab%20Newsletter_2018_final.pdf, and https://www.dfw.state.or.us/MRP/shellfish/commercial/crab/news_publications.asp). Like many other important fisheries, Dungeness crab use Coos Bay and the surrounding nearshore area for nursery habitat that may be affected by this project's proposed dredging activity, and the Coos Bay fishing fleet relies heavily on crab for its profits.

Connection to Port of Coos Bay Channel Modification Project, Cumulative Effects - The JCEP terminal will dredge a combined total of 5.7 million cubic yards (CY) from North Spit and Coos Bay in order to create the slip for ships to load liquefied natural gas (LNG) and navigate along the Coos Bay channel to the ocean. The Port of Coos Bay has also proposed a navigation channel modification project (US Army Corps of Engineers – USACE Environmental Impact Statement, see Federal Register 82 FR 39417) that will also highly benefit the JCEP/PCGP project. ODFW recognizes that the Port of Coos Bay channel modification project will convey benefit to the JCEP/PCGP project both in terms of financial savings and through increased transport efficiency. Accordingly, ODFW recommends that the FERC jointly consider the impacts of the USACE Port of Coos Bay Channel Modification Project, because they are connected, similar, and cumulative actions. Some of the impacts of the combined projects include:

- Deepening and widening of the existing Coos Bay navigational channel to 37' deep and 300' wide
- Expansion of the Coos Bay navigational channel to 45' deep and 450' wide from the channel entrance to River Mile 8.2
- Alteration of the hydrodynamic characteristics of the Coos Bay estuarine tidal basin in response to deepening and widening, including:
    - Physical changes in the intrusion of marine waters, coupled with alteration of the salinity regime, conductivity, exchange volume, tidal prism, tidal currents, and other parameters
    - Shifts in the location, configuration, and spatial extent of marine-dominated, estuarine, and freshwater-tidal habitats
    - Changes in the composition of ecological communities that reside within the water column, marine-dominated, estuarine, and freshwater-tidal habitats
    - Changes in the location and potential for rearing of juvenile fish
- Disposal of 18 million CY of dredge material at upland sites on the JCEP project lands

located southwest of the OR Highway 101 bridge at the APCO Sites, and disposal of dredged material at the Kentuck Project Site;

- Impacts to the ocean floor outside the mouth of Coos Bay where a large quantity of dredged material (estimated at 18-25 million CY) will be deposited at an ocean disposal site, or multiple sites, that have not been fully identified, including:
  - Deposition of dredged materials on the ocean floor will alter the physical characteristics of the benthic habitat due to both the substantial modification of the bottom topography and the anticipated characteristics of the dredged material (e.g. estimated 8.5 million CY of sandstone and siltstone debris);
  - Deposition of dredged materials on the ocean floor will impact the benthic communities of resident marine fish and invertebrates, as well as transient species of concern including green sturgeon (*Acipenser medirostris*);
  - Dredged materials transported away from the deposition sites have the potential to negatively affect important nearby rocky reef habitats;
  - Disposal of dredged materials may occur in areas of heavy Dungeness crab commercial fishing activity, potentially interfering with crab habitat and fishing vessels; and
  - Excessive mounding of sediments can alter the wave climate, creating enhanced risk to commercial fishing vessels that navigate nearshore waters during stormy conditions.
- Installation of a large rock apron at the toe of the North Jetty at the entrance to Coos Bay;
- Excavation of a new vessel turning basin with a length of 1400 feet, width 1100 feet at -37 feet deep (constructed approximately between River Miles 7.3 to 7.8);
- Disposal of 700,000 CY of dredged material through mechanical or hydraulic methods (24 inch pipeline laid on bottom of Coos Bay 8.3 miles) then distributed between the APCO 1 and 2 disposal sites between River Mile 2 to 7;
  - Dredge Area #1, RM 2: 150-feet wide and 550-feet long, 15.1 acres, 350,020 CY
  - Dredge Area #2, RM 4.5: 200 ft wide and 2500 ft long, 13.4 acres, 184,000 CY
  - Dredge Area #3, RM 6: 150 ft wide, 1150 ft long, 2.9 acres, 25,200 CY
  - Dredge Area #4, RM 6.8: 100 ft wide, 625 ft long, 4.0 acres, 24,000 CY
- Dredging will affect 35.4 acres of subtidal habitat within Coos Bay that is important for production of species such as Dungeness crab (*Cancer magister*), white sturgeon (*Acipenser transmontanus*), and California halibut (*Paralichthys californicus*);
- 300,000 CY of dredge material from the JCEP project will be disposed of at the Kentuck Mitigation Site.

Marked change will occur to the productivity of the dredged portion of the bay and little recovery is expected over time due to the continual need for maintenance dredging. In the DEIS (Section 2.1.1.8), JCEP proposes to conduct maintenance dredging every 3 years with about 115,000 cy of material removed per dredging interval for the first 12 years of operation. The DEIS states that maintenance dredging could be done every 5 years with up to 160,000 cy of materials removed during each dredging event. In the marine waterway, dredging would also be conducted about every 3 years with roughly 27,900 cy of materials removed during each dredging event. Dredging operations of this magnitude will result in a continually disturbed condition preventing development of any reliable estuarine production in the affected areas. Additionally, the Port of Coos Bay project will likely dredge substantially more on an annual basis.

To not consider the combined impacts of the Port's channel modification project and the JCEP project will effectively underestimate the biological and economic impacts to the State's fish and wildlife habitat resources in the Coos Bay estuary, due to these connected, similar, and cumulative actions.

JCEP LNG Terminal Impacts to the Coos Bay Estuary - The proposed project is large in scope, will likely incur deleterious ecological impacts, and have legacy implications for aquatic habitats of Coos Bay and upland habitats on the North Spit. The North Spit is one of the only ocean peninsula land features in the state with estuarine, ocean, wetland, and upland habitats available for fish and wildlife within a very small geographical area. This unique landform and bay provide a number of strategic benefits for production of fish and wildlife. Coos Bay is the largest estuary located entirely in Oregon and supports populations of fish and shellfish that contribute to large commercial and recreational fisheries. The aquatic and upland habitats encompassed by the JCEP terminal and associated facilities have been subjected historically to a number of landscape and waterway alterations including: dredging, riprap installation, leveling, and removal of native coastal pine forest, filling of wetlands, and other development related impacts. These habitats historically would have been primarily characterized as Category 2 or 3 habitats, (providing essential, important, and/or limited habitat function for fish and wildlife) under the ODFW Fish and Wildlife Habitat Mitigation Policy. Although negatively impacted historically, much of the tidal, subtidal, and upland habitats at the proposed project site have received only minimal disturbance in the past two decades and substantial recovery of ecological function has occurred.

The subtidal, tidal, intertidal, and shoreline features of the Coos Bay estuary tidal basin provide critical habitat for a number of culturally and economically important game and non-game species including, but not limited to: Dungeness crab (*Metacarcinus magister*), red rock crab *(Cancer productus*), cockles (*Clinocardium nuttallii*), gaper clams (*Tresus capax)*, butter clams (*Saxidomus giganteus)*, littleneck clams (*Protothaca staminea*), rockfish (*Sebastes spp.*), lingcod (*Ophiodon elongates*), greenling (*Hexagrammos decagrammus*), California halibut (*Paralichthys californicus*), English sole (*Parophrys vetulus*), Pacific sand dabs (*Citharichthys sordidus*), ghost shrimp (*Neotrypaea californiensis*), mud shrimp (*Upogebia pugettensis*), starry flounder *(Platichthys stellatus)*, smelts (Osmeridae family), (Engraulidae family), sardines (Clupeidae family), fall run Chinook salmon *(Oncorhynchus tshawytscha)*, green sturgeon *(Acipenser medirostris)*, white sturgeon *(A. transmontanus)*, (OC) ESA threatened coho salmon *(Orncorhunchus kisutch)*, and possibly Pacific lamprey (*Entosphenus tridentata*). There is some potential that Pacific smelt (eulachon) (*Thaleichthys pacificus)* may also occur in the JCEP area of Coos Bay. Additionally, the tideflats and subtidal regions of the lower Coos estuary are sites for the commercial harvest of bay clams (gaper clams, butter clams, cockles) and the mudflats in the JCEP area support a commercial fishery for ghost shrimp (*Neotrypaea californiensis*).

Scattered populations of the native Olympia oyster (*Ostrea lurida*) have recently become re-established within the marine and polyhaline regions of the Coos Bay estuary where they typically occur as individuals or small clusters attached to rip-rap, rock, shell, or other hard substrata. The recovering populations of *O. lurida* are considered as a Strategy Species by the Oregon Department of Fish and Wildlife / Nearshore Conservation Plan (www.oregonconservationstrategy.org). Section 4.5.2.2 (page 427) of the DEIS states that suspended sediments from the dredging will not significantly affect oysters in Coos Bay. ODFW does not agree with FERC's determination. These at-risk populations of Olympia oysters are particularly sensitive to smothering and burial by silt and other suspended materials, and it is likely that they will be exposed to heavy loads of suspended sediment and excessive siltation during dredging activities associated with excavation of the new JCEP Terminal. ODFW recommends further evaluation and development of mitigation strategies for impacts to Olympia oysters.

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The proposed slip will create a new deepwater alcove backwater likely resulting in a number of significant biological effects (e.g. change to water flow patterns in the vicinity, salinity patterns, turbidity associated with initial and repeated dredging, and shallow water conversion to deepwater). While hydrodynamic models provide some insight into the physical changes that the site and bay may undergo, biological changes should be studied in situ to accommodate unknown variables. The actual JCEP longer-term, indirect impacts to the larger estuary may not be accurately predicted prior to construction.

Dredging Impacts to Estuarine Habitats and Communities – The JCEP DEIS describes the location and extent of dredging and removal of unconsolidated sediment from the intertidal and subtidal zones of the Coos estuary, but only superficially considers the potential effects of dredging on aquatic habitat and species that are expected to occur in response to construction of the different components of the JCEP terminal (Section 4.5.2.2). Direct impacts to estuarine habitats associated with construction of the vessel slip, access channel, temporary material barge berth, the material offloading facility, and rock pile apron (Table 4.5.2.2-2; page 4-241) are expected to be long-lasting and substantial. In particular, the estuarine portion of the Jordan Cove LNG Facilities would include direct impacts to 37 acres of estuarine habitat, including 2 acres of eelgrass habitat, 13 acres of intertidal habitat, 4 acres of shallow subtidal habitat, and 18 acres of deep subtidal habitat. The JCEP also includes extensive dredging and excavation of four submerged areas of the sub-tidal zone in Coos Bay (total 40 acres) along the Federal Navigational Channel and vessel access route to improve navigation reliability for the LNG carriers.

Unconsolidated soft-sediment habitat is widespread in the Coos Bay estuary tidal basin where it occurs extensively throughout the intertidal zone and sub-tidal zone along the bottoms, sides, and margins of primary and secondary tidal channels (Cortright *et al*., 1987). Soft-sediment habitats provide a series of diverse, productive, and dynamic ecological functions in the estuary, including provision of habitat and forage areas for invertebrates, fish, birds, and marine mammals, as well as serving as an important source of detritus. Soft-sediments also play an important role in the microbial and biogeochemical transformations of organic materials and nutrient cycling, and they typically serve as a sink or reservoir for the deposition of water-borne particles. Diverse communities of motile, epifaunal, and infaunal invertebrates inhabit the soft-sediments, and the communities of crabs, shrimp, amphipods, polychaete worms, copepods, hydroids, anemones, clams, and other invertebrates are specifically adapted to survive, feed, grow, and reproduce themselves in the unconsolidated sediments (Simenstad 1983; Emmett *et al*., 2000). Microbial activity and deposition of organic matter associated with fine-grained sediments together support a complex food web that includes multiple resident (infaunal, epifaunal, motile) and transitory (seasonal, migratory) species.

The JCEP DEIS incorrectly illustrates the major known oyster and shrimp habitat and clamming and crabbing areas in the bay relative to the Project activities (Figure 4.5-2). In particular, mixed communities of bay clams (*i.e.*, gaper clams, butter clams, cockles, and other species) are known to occur throughout the intertidal zone in the area immediately west and north-west of the airport runway (ODFW 2009; area AP). These areas are illustrated only as “Shrimp Habitat” and “Oyster Habitat” in Figure 4.5-2. It is not clear why the known clam beds located nearest the JCEP project area were omitted from Figure 4.5-2, when the map incorporates spatial information about the other clam beds throughout the intertidal zone of the Coos Bay estuary tidal basin further distances away from the JCEP project area. The known clam beds within ODFW area AP (Airport Runway) are

located within 50 m of the Temporary Dredge Line for the Federal Navigation Channel and within about 500 m of the proposed JCEP Access Channel, as illustrated in Figure 4.5-3 of the JCEP DEIS. In addition, it is also unclear what species of oyster is intended to be represented by the broad polygon that extends throughout the intertidal zone as "Oyster Habitat" in Figure 4.5-2. Commercial mariculture of Pacific oysters (*Crassostrea gigas*) does not occur anywhere in the intertidal zone near the airport runway, and patchy clusters of Olympia oysters (*Ostrea lurida*) only occur on the rocky rip-rap that extends around the periphery of the airport runway. The spatial distribution for major clam beds and shrimp beds should be corrected and updated with relevant information generated by ODFW for Coos Bay (2009).

Mixed communities of shellfish, such as Dungeness crab, red rock crab, bay shrimp, gaper clams, butter clams, littleneck clams, softshell clams, cockles, and many other species are year-round residents of the intertidal and sub-tidal areas of the Coos Bay estuary. Some of these shellfish are motile (*i.e.*, crabs and shrimp) and periodically move to different locations or migrate through the intertidal and sub-tidal zones, while others are stationary (*i.e.*, bivalves) and remain largely in place over the duration of their adult lives. The mixed communities of living bivalves and the beds of their non-living shells (*e.g.*, shell rubble or shell hash) are particularly important because they function to stabilize unconsolidated sediments and provide heterogeneous habitat for numerous species of adult and juvenile fishes, crabs, shrimp, amphipods, worms, and other estuarine organisms. Moreover, filter-feeding by dense populations of living clams can sometimes play an important role in the removal of phytoplankton and smaller particulate materials, thereby decreasing turbidity and increasing light penetration through the estuarine water column. Consequently, maintenance of suitable soft-sediment habitat is essential for survival of the moderately long-lived (life-span 10-15 years or longer) gaper, butter, and cockle clams, particularly in the sub-tidal zone. When soft-sediment habitat is chronically disturbed and altered by dredging of the subtidal zone, there may be a permanent loss and impact to benthic invertebrate populations and a decline in the biodiversity of benthic communities. Loss of some or all of these sub-tidal populations of bay clams has implications for both the ecological functioning of sub-tidal habitats and the ability of the bay clams to serve as broodstock to support the recreational and commercial shellfish fisheries in Coos Bay (D'Andrea 2012).

It is expected that dredging and removal of the soft-sediments will likely have substantial and immediate local impacts on the sub-tidal populations of benthic invertebrates and shellfish, such as gaper clams, butter clams, and cockles. This may include the physical removal of the clams and their surrounding sediments, as well as a disruption of the mixed ecological communities of shellfish, mobile and infaunal invertebrates, and fish that make use of the sub-tidal habitats. The JCEP DEIS states that dredging would directly remove benthic organisms (e.g., worms, clams, benthic shrimp, starfish, and vegetation) from the bay bottom within the access channel and navigation channel modifications. Mobile organisms such as crabs, many shrimp, and fish could move away from the region during the process, although some will be entrained during dredging so that direct mortally or injury could occur (Effects on Aquatic Habitat and Aquatic Species from Construction of the Jordan Cove LNG Facilities; 4-247).

The JCEP DEIS acknowledges that dredging, removal, and disturbance of the soft-sediment habitats will directly remove benthic organisms from the bay bottom, and the DEIS also states that it is likely that recovery would

occur in about one year for benthic resources particularly in the area of navigation channel modifications (4-248). This estimate of the rapid rate of community recovery is problematic, however, because the technical references cited by the JCEP DEIS (4-248) are drawn from earlier investigations of dredging impacts that generally used a group small-bodied, rapidly-growing invertebrates (including amphipods, polychaete worms, small bivalves, etc. that have life-spans on the scale of months to a few years) as the focal species to provide metrics for the estimates of species and habitat recovery. These small opportunistic species are not representative of the large-bodied, long-lived bay clams that typically exhibit episodic recruitment and have life-spans on the scale of 10-20 years in the Oregon estuaries. Moreover, large-scale dredging modifications that include subsequent maintenance dredging every 5-10 years may not provide the opportunity for bay clams and other shellfish to recruit successfully and fully re-colonize after the repeated disturbance events. It is also likely that benthic food resources may also be impaired or lost for other estuarine species (*i.e.*, forage fish, salmonids, crab) as a result of dredging actions. Consequently, dredging activities that significantly disturb and/or remove the mixed communities of long-lived bay clams from soft-sediment habitat in the sub-tidal zones of Coos Bay are expected to have longer-term impacts that extend well beyond a time period of many years.

As proposed, the JCEP also includes extensive dredging and excavation of four submerged areas of the sub-tidal zone in Coos Bay along the Federal Navigational Channel and vessel access route to improve navigation reliability for the LNG carriers. These actions include dredging of 27 acres of deep subtidal habitat at bend areas along the Federal Navigation Channel, and the dredge lines for this additional activity would include disturbance and modification of another 13 acres of mostly deep subtidal habitat. The JCEP DEIS points out that these additional dredging activities and follow-up maintenance dredging would disturb the 40 acres of subtidal habitat and result in a short-term reduction in the ecological function of these areas by disturbance of the benthic and epibenthic organisms.

Impacts to Eelgrass - The proposed JCEP project includes construction of a marine terminal slip and dredging of an access channel. These activities will permanently destroy about 1.9 acres of established native eelgrass (*Zostera marina*).

Dredging in the intertidal and shallow subtidal zones within the JCEP project area is expected to have significant deleterious effects on native eelgrass habitats and the species found therein. Beds of eelgrass occur at several locations throughout the Coos Bay tidal basin where they provide numerous ecological functions, including heterogeneous habitat for a number of fish and wildlife species, nursery habitat for invertebrates and fish, forage areas for shorebirds and waterfowl, primary production and a source of organic-rich detritus, stabilization of unconsolidated sediments, trapping of suspended sediments, and contribute to improvements to estuarine water quality (Thom et al. 2003; Kentula and DeWitt 2003). In particular, the emergent blades and rhizomes of eelgrass beds provide complex and heterogeneous multi-dimensional habitat within the unconsolidated soft-sediments in the intertidal and shallow subtidal zones. In many cases, the abundance and species composition of macroinvertebrate, shellfish, and fish communities differ within eelgrass beds in comparison with un-vegetated areas where eelgrass is absent. Eelgrass beds are known to provide habitat for numerous species of invertebrates, including polychaete worms, cockles, gaper clams, butter clams, littleneck clams, Dungeness crab, grass shrimp and epibenthic invertebrates such as harpacticoid copepods, isopods, and gammerid amphipods, In addition, eelgrass beds also provide habitat for a diverse community of fishes, including juvenile salmonids, sculpin, English sole, shiner perch, lingcod, rockfish, pipefish, and herring.

Long-term efforts to remove root wads, large woody debris, and other natural structures embedded in the un-vegetated soft sediment of Coos Bay in order to facilitate commercial shipping and recreational boating have greatly exacerbated the lack of structural complexity along the shoreline and further increase the ecological importance of eelgrass beds. The heterogeneous canopies of eelgrass beds provide both primary complexity and an ecological edge effect that presents an important biophysical transition zone for fish and invertebrates that forage in adjacent un-vegetated habitats.

Introduction of Non-indigenous Species through Ballast Discharge – Movement and translocation of ballast water associated with vessels is widely considered as the most significant transfer mechanism for non-indigenous species in the marine environment. Filling of LNG carriers at the JCEP Terminal will be coupled with concurrent discharge of ballast water that will exit the terminal area and mix with the tidal waters of the Coos Bay estuary. Consequently, it is expected that the Coos estuary will receive a very large volume of estuarine / ballast water that originated in foreign ports, as well as seawater that was pumped into the vessel at sea during transit. This ballast water typically contains a taxonomically diverse and reproductively viable community of estuarine and marine organisms that have potential to establish themselves as non-indigenous species within the estuarine tidal basin.

The DEIS (Section 4.3 Water Resources and Wetlands; and 4.5.2 Aquatic Resources) states that while berthed the LNG carriers would release ballast water and engine cooling water into the marine slip. It is estimated that each LNG carrier would discharge approximately 9.2 million gallons of ballast water during the loading cycle to compensate for 50 percent of the mass of LNG cargo loaded, and that the ballast water discharge rate would be approximately 20,250 gallons per minute (gpm). The DEIS states that the newer LNG carriers are expected to conform to the "D-2" standards that require ships to utilize on-board ballast water treatment systems. In contrast, existing LNG carriers that do not currently have on-board ballast water treatment systems must continue to, at a minimum, conduct open-sea exchanges of ballast water in conformity with the "D-1" standard. The DEIS concludes that the effects of ballast water exchange and the measures that will be implemented to minimize or avoid effects from ballast water introductions are adequate to ensure that operation of the JCEP would not significantly affect marine resources. However, the DEIS does not contain any information about the timing of ballast water discharge events to coincide with flood or ebb periods of the semi-diurnal tidal cycle, nor any estimate of the retention time for the ballast water discharged from the individual LNG carriers. The conclusion reached by the DEIS is further is flawed because earlier research conducted by the Smithsonian Environmental Research Center (Ruiz et al., 2005) demonstrated that flow-through ballast water exchange (or the open-sea exchange; D-1 standard) is not an effective deterrent to ensure that organisms are not entrained, transported, and discharged from ballast tanks. Furthermore, the ballast water discharge standard (33 CFR 151.2030(a)) requires all vessels calling at U.S. ports to be equipped with a Coast Guard-approved Ballast Water Management (BWM) system. The DEIS, however, does not provide details about the BWM systems that will be used within the fleet of bulk carriers and LNG carriers that are expected to discharge about 6.8 million cubic meters of ballast water each year into the tidal waters of the Coos estuary. Discharge of this large volume of saline water that originated in foreign ports into the Coos estuary has a very high potential to introduce non-indigenous species into the estuarine waters in the vicinity of the JCEP Terminal. Consequently, the conclusion reached by the DEIS that ballast water discharged from the LNG carriers and other vessels associated with the JCEP Terminal will not provide a vector for introduction of new non-

indigenous species is not fully supported, and ODFW recommends this issue be re-analyzed and impacts fully addressed through appropriate minimization and mitigation measures.

Disturbance to Marine Mammals – Numerous species of marine mammals routinely occur in the nearshore marine waters immediately outside the mouth of Coos Bay, and several species temporarily or permanently reside within the Coos estuary tidal basin (Rumrill, 2003). The JCEP – DEIS properly recognizes that many species of marine mammals species are common in the waterway leading to the Jordan Cove LNG Terminal, including eight species of whales and one species of sea lion (Appendix I, Table I-1). However, the DEIS does not point out that California sea lions (*Zalophus californianus*) are common near the docks and marinas immediately inside the mouth of Coos Bay, and that Steller sea lions (*Eumetopias jubatus*) sometimes forage in the estuary from haul out sites at nearby Cape Arago. In addition, juvenile northern elephant seals (*Mirounga angustirostris*), orca (*Orcinus orca*), harbor porpoise (*Phocoena phocoena*), and gray whales (*Eschrichtius robustus*) are occasional visitors to the tidal waters of the Coos estuary.

In contrast to the temporary use of the estuary by the species of marine mammals described above, the tidal waters and submerged/submersible lands within the Coos estuary are inhabited year-round by populations of Pacific harbor seals (*Phoca vitulina*). Pacific harbor seals haul out in large numbers on the exposed tideflats at multiple sites located in the lower region of the Coos estuary and in South Slough, and they forage in the estuary where they prey upon numerous species of resident and transitory estuarine fish. Breeding activities typically occur between February and May, and the harbor seal pups are born and weaned in the estuary from March to June. The Oregon populations of *P. vitulina* are considered as a Strategy Species by the Oregon Department of Fish and Wildlife / Nearshore Conservation Plan, and priority conservation actions have been identified to limit anthropogenic disturbance, adhere to the federal protections developed by NMFS, and capitalize on opportunities to generate new information and fill data gaps.

Construction and operation of the JCEP and the subsequent increase vessel traffic by large LNG carriers to 140 trips per year raises primary concerns about disturbance to the Pacific harbor seal populations that reside year-round within the Coos estuary tidal basin. In particular, it is expected that harbor seals will be susceptible to immediate and acute disturbance by noise associated with construction of the JCEP Terminal as well as longer-term chronic disturbance from vessel wakes and noise generated by passage of the LNG carriers through the Coos Navigational Channel. The DEIS includes recommendations that JCEP prepare a Marine Mammal Monitoring Plan that identifies specific measures that would be implemented to reduce noise impacts and to ensure compliance with NMFS underwater noise criteria pertaining to ESA-listed species of whales. To the extent possible, the department urges that the scope of the Marine Mammal Monitoring Plan prepared by JCEP be expanded to also include consideration of the effects of noise on resident populations of adult and juvenile harbor seals and to minimize potential disturbance to early season harbor seal breeding and pupping activities. In addition, the DEIS and Marine Mammal Monitoring Plan should also acknowledge the potential for chronic disturbance to the harbor seal haul out sites associated with vessel wakes generated by the passage of the LNG carriers. Hauled out harbor seals are known to exhibit an increased likelihood of entering the water when they are disturbed by the presence of large vessels (2X increase in disturbance), and when the vessels are within 100 m of the haul out site (3.7X increase in disturbance; Mathews et al., 2016). Moreover, adult harbor

seals also exhibit an increased likelihood of entering the water in response to vessels whenever a pup is present (1.3X increase in disturbance). These observations made in Alaska indicate that harbor seal haul-outs are disturbed by the passage of large vessels, and they suggest that local fitness of the resident population of harbor seals may be reduced by vessel disturbances particularly when they occur during breeding and pupping seasons (Mathews et al., 2016).

The department is in agreement with the DEIS recommendation that construction of the JCEP Terminal should not occur until consultation with USFWS, NMFS and ODFW regarding potential disturbance and impacts to marine mammals is complete. Accordingly, it is premature at this time for the DEIS to conclude that constructing and operating the JCEP would not significantly affect the species of marine mammals within the project area.

Impacts to Wildlife in Freshwater Wetlands, Uplands, and Beaches on the North Spit – ODFW considered the impacts of this project to all relevant wildlife in its review of the DEIS, but the purpose of this section is to highlight some of the priority issues ODFW found within the DEIS.

Freshwater wetland habitats on the North Spit provide functionally important ecological features as they contribute to nutrient cycling where the sandy soil types are very limited in primary nutrients, and they provide freshwater refugia within a short distance of saline habitats. The wetlands and open water ponds are important for production of a number of amphibians including rough skinned newts (*Taricha granulosa*), red-legged frogs (Rana aurora), as well as several species of tree frog (i.e. Pacific tree frog *Pseudacris regilla*). Three-spined stickleback (*Gasterosteus aculeatus*) occupy a number of the ponds and deeper wetlands. Numerous waterfowl species transition through these ponds including mallards (*Anas platyrhynchos*), bluebills (*Aythya marila*), wood ducks *(Aix sponsa*), and Canada geese (*Branta Canadensis*). ODFW recommends that FERC condition the project such that these impacts be avoided, minimized, and mitigated to the maximum extent practicable.

It is ODFW's understanding that unavoidable impacts to freshwater wetlands will be mitigated for at the Kentuck Mitigation Site (comments on Kentuck provided below). ODFW uses the Fish and Wildlife Habitat Mitigation Policy (OAR 635 Division 415, described more fully below) to determine necessary mitigation offsets depending on the functions and values of the habitat being impacted (what the policy refers to as habitat categories). In previous iterations of this project, the applicant's consultant (David Evans and Associates; DEA) provided ODFW with preliminary categorizations of impacted habitats according to this ODFW Mitigation Policy. From 2011-2014, ODFW and DEA determined that within the project area for the JCEP liquefaction and workforce housing there is an approximate total of 33.9 acres of Category 2 habitat as follows: 16.7 estuarine/intertidal habitat; 0.3 acres of low salt marsh; 5.8 acres of intertidal unvegetated sand; 4.7 acres of algae/mud/sand; 3.4 acres of shallow subtidal; and 3.0 acres of eelgrass habitat within the project location where estuarine dredging is proposed. There is 15.4 acres of deep subtidal Category 3 habitat that is proposed for dredging as well. ODFW has requested updated Habitat Categorization, per the ODFW Fish and Wildlife Habitat Mitigation Policy, and acreages from the Applicant but has not received this information at the time of these comments. In addition, the DEIS does not make it clear whether this mitigation is addressing temporal loss for those impacts lasting longer than 2 years but something less than permanent. As per the ODFW Fish and Wildlife Habitat Mitigation Policy (described below), offsets should be provided for those temporarily impacted areas that may be unavailable to fish and wildlife while vegetation is recovering. It is difficult for ODFW to determine from the existing information in the DEIS whether or not the State of Oregon's fish and wildlife resources are being

adequately addressed in freshwater wetlands impacted by the JCEP project.

ODFW also considered the wildlife resources in the uplands that will be displaced by this complete conversion of upland habitat to a new deepwater terminal/zone, construction of facilities, deposition of dredge materials, and long-term daily disturbance factors attributable to project activities. The North Spit is used by a variety of important wildlife such as the snowy plover (*Charadrius nivosus nivosus*), coastal marten (*Martes caurina*), pacific fisher (*Pakania pennantii*), bald eagle (*Haliaeetus leucocephalus*), rookeries for great blue heron (*Ardea herodius*), black-tailed deer (*Odocoileus hemionus*), American beaver (Castor Canadensis), mountain lion (Puma concolor), Roosevelt elk (*Cervus elaphus rooseveltii*), porcupine (*Erethizon dorsatum*), various bat species, and black bear (*Ursus americanus*). There are also 11 species of amphibians (8 salamanders, 3 frogs) and at least 10 species of reptiles that have been found to occur on the North Spit. It is ODFW's understanding that three potential mitigation sites have been identified to address upland habitat impacts on the North Spit, however it is not clear based on information provided in the DEIS if or how those sites offset the functions and values being lost through this project (more discussion below).

ODFW also found the DEIS provided insufficient information and assessment for the following key wildlife species and their habitats.

Impacts of the LNG Terminal on Snowy Plover Nesting and Foraging Habitat – ODFW is particularly concerned about the JCEP project's impacts to western snowy plover (hereafter, snowy plover) nesting and foraging habitat. This species is federally listed, but is also listed as Threatened on the Oregon Endangered Species Act (ORS 496.171-192, also see OAR 635-100-0105). ODFW's understanding from reading the DEIS is that FERC and its Cooperating Agencies have not yet developed a biological assessment (BA) or begun consultation with the USFWS, which has federal jurisdiction per the federal ESA. ODFW understands that consultation will fall under Section 7 for the federal action and for the federal lands within the project, but that Section 10 of the federal ESA will also apply to the non-federal portion of the project. The DEIS does not discuss how this consultation will occur on the non-federal portion of the project, or how this relates to FERC's authority and decision making for a project that crosses multiple land ownerships, and ODFW recommends this information be provided.

Snowy plovers populations have declined on the Pacific coast over the past century, but recent nest monitoring has shown stable to increasing populations. The reason for the recent increase is the intensive and coordinated management by state (ODFW, OPRD) and federal agencies (USFWS, USACE, USFS, BLM) to address the threats to the plover including 1) habitat destruction caused by development and recreation, 2) resource extraction, 3) invasion of non-native beachgrass (*Ammophila* spp.), and 3) increased predation by corvids (ravens and crows) and other predators (gulls, coyotes, skunks, etc..) (USFWS 2007). The North Spit is a particularly important component of snowy plover habitat along the Oregon coast, with the highest numbers of nesting plovers and the highest nest success rates among all plover sites (Lauten et al. 2018, M. Nugent ODFW personal communication). One of the primary reasons for the North Spit's success is the multi-agency maintenance of grass-free sandy beaches within snowy plover habitat restoration areas (HRA) as well as recreation management by OPRD and predator control by US APHIS Wildlife Services. Significant funding and resources have gone into snowy plover recovery on the North Spit. Without this constant management, it is without question that snowy plover abundance and productivity at the North Spit would decline and the species would be at risk of serious depletion.

Despite these constant and expensive management efforts, there are additional threats which cannot be managed locally. With climate change, the North Spit is experiencing an increased frequency and intensity of storm events. Overwash from high tide events during these storms destroy nests, and prevailing winds during these storm events can cause blowing sand to bury nests. With the predicted rise in sea levels associated with climate change, this only increases the risk of loss of beach habitat for snowy plovers.

Any additional threat puts the snowy plover at risk of declining again. Impacts to plover nesting and foraging areas may come from the noise associated with construction and operation, but more likely from the increased recreational pressure and subsequent increase in predators on the North Spit. On page 4-322 of the DEIS, FERC states *"Jordan Cove terminal construction and operations personnel would likely use the North Spit for recreational purposes and increased recreational use could result in increased plover disturbance including destruction of nests by dogs, off-road vehicle traffic, inadvertent trampling, or increased predation if scavengers and predators (corvids, coyotes, striped skunk, feral cats) are attracted to nesting areas due to the presence of trash and food remains".* ODFW contends that given the other threats this plover colony is facing on the North Spit, these new threats would likely tip the scales toward declining performance and abandonment of the colony. ODFW expects the BA and consultation with USFWS to give adequate attention to the additive threats posed by the JCEP project to the snowy plover, and would appreciate consultation with ODFW to identify appropriate avoidance, minimization, and mitigation measures (further discussed below in the mitigation section of this letter).

Impacts to Coastal Marten Habitat – Adjacent to the slip is a large dune occupied by a mature shore pine vegetation community that is potential habitat for the coastal marten (*Martes caurina*). Coastal martens have a limited range and occur in coastal shore pine as well as late-successional mixed conifer forests. Coastal martens have an apparently low survival rate in fragmented forests elsewhere in the United States, and habitat connectivity has been identified as one of the key conservation strategies for this species. Abundance and distribution of the coastal marten in Oregon is still largely unknown at this time, though ongoing research by ODFW, universities, and federal partners is underway. Coastal martens have been documented on trail cameras in close proximity to the site in 2018, easily within range of the JCEP project site and in identical shore pine habitat.

Conservation concern for the coastal marten is on the rise. Currently ODFW considers the coastal marten a State Sensitive Species and an Oregon Conservation Strategy Species for the reasons described above. Coastal martens were recently petitioned for listing on the federal Endangered Species Act list (80 FR 18741) and the USFWS has not yet issued its decision as of the writing of this letter. Conservation organizations also recently petitioned the Oregon Fish and Wildlife Commission to consider listing the coastal marten on the Oregon ESA, however the Commission decided not to consider a petition to list due to a lack of substantial scientific information (see OFWC Sept 2018 Staff Report Exhibit H and Meeting Minutes). Additionally, the OFWC was petitioned in 2018 to close fur-trapping of coastal martens west of Interstate 5, as well as all furbearer and unprotected mammal trapping in the Oregon Dunes National Recreation Area (see OFWC Aug 2018 Staff Report Exhibit D and Meeting Minutes). The OFWC will make its decision on this petition in 2019.

Habitat Loss at the JCEP LNG Terminal Site - ODFW recognizes that a substantial proportion of the upland habitats at the JCEP sites adjacent to the bay are not in pristine condition. However, they have been in a relative state of quiescence for more than a decade and are predominantly considered Category 3, 4, and 5 habitats (per OAR 635-415-0000 through 0025). A substantial component of forested dune habitat remains in Category 3 condition at the site. These lands will be altered from their current condition through several pathways including:

- Conversion of terrestrial lands into submerged lands.
- Elimination of the viability of remaining dune and forested dune habitats (largely due to encroachment, removal, disturbance, etc.) and reduction in the viability of immediately adjacent habitat as a result of construction of the LNG storage tanks and pipeline network, installation of road networks to support the site, and direct forest clearing of at least 90.0 acres.
- Impacts to the uplands and wetlands at the JCEP sites will essentially render much of the affected habitats area incapable of supporting the native plant and wildlife species that currently occupy the site due to a number of factors including, but not limited to:
    - Direct removal and disturbance (e.g. disturbance factors such as ship moorage/loading activities and road traffic, machinery and compressor noise). The DEIS notes that during construction sound levels will be similar to the city of North Bend. The DEIS states, "We predict that operational noise from the LNG terminal would have an equivalent sound level (Leq) of 49 dBA and day-night sound level (Ldn) of 55 dBA when measured about 0.7 miles away".
    - Alteration of the surfaces through paving, placement of gravel, removal of the organic layer on the sandy soils, etc. that eliminate capacity of the habitats to support fish and wildlife
    - Invasion of competitive plants and non-native or native plant and animal colonists such as crows, starlings, and Scotch broom (*Sarothamnus scoparius*) that result in a loss of habitat capacity and function due to competitive interactions.
- Institution of daily human disturbance that will likely occur post-construction during the operations at the site.
- Creation of the slip/berth and associated LNG facility will further fragment the North Spit peninsula. Peninsula type habitats are uniquely rare on the Oregon Coast.

Impacts from the PCGP Pipeline to Fish and Wildlife Habitat - The FERC DEIS description for the PCGP (pipeline) portion of the project outlines proposed construction of a 36" steel gas pipeline from the North Spit of Coos Bay, Oregon (229 miles) to Malin, OR in order to connect the JCEP export facility to the Ruby LNG pipeline carrying gas primarily from the Rocky Mountain region. The pipeline will cause significant direct and indirect impacts to fish and wildlife habitat, as well as the indirect impacts to water quality associated with an increase in watershed runoff caused by this project, particularly in areas where the pipeline is proposed on slopes exceeding 50%, and where vegetation will be removed from riparian corridors. Impacts are likely within the Coos, Coquille, South Umpqua, Upper Rogue, Upper Klamath, and Lost River watersheds. According to the DEIS, the pipeline would affect 352 waterbodies, including 69 perennial streams, 270 intermittent streams, 9 perennial ponds, and 4 estuaries (Page 4-93). This is significant because all of these waterbodies provide habitat for fish and wildlife.

The applicant proposes to utilize horizontal directional drilling (HDD) for the crossing of the Coos Bay estuary, Coos River, Rogue River, and Klamath River. The applicant would use dry open-cut crossing methods where HDD methods are not planned. These actions will have temporary and permanent impacts to fish and wildlife

habitats, which ODFW recommends be addressed consistent with the ODFW Fish and Wildlife Habitat Mitigation Policy, be performed consistent with ODFW recommended In-Water Work Windows, and be permitted where applicable via ODFW In- Water Blasting and Fish Passage authorizations.

ODFW acknowledges that some of the aquatic habitats in Coos Bay have been impacted historically from dredging, rip-rap installation, upland and tidal mudflat leveling, filling of tidal wetlands/saltmarsh, and other development/utilization impacts, However, substantial recovery of ecological potential has occurred due to improvements in forest management (reducing sediment inputs) and regulations conserving wetlands and waterways. The current and desired future condition of the waterbodies that will be affected by the pipeline is predominantly linked to management actions in the riparian habitats and adjacent uplands. Many of the streams that will be impacted by the pipeline have been ecologically degraded historically by a number of human impacts including: removal of native coastal riparian forest, road construction with subsequent chronic sediment contribution, and debris torrent/mass-wasting events related to forestry activities. The majority of these streams, many of which are critical for native salmon, trout, sculpin, lamprey, and other aquatic species production, are in a gradual trend of recovery following management guidelines and Best Management Practices implemented through agency and private ownership coordinated efforts (Oregon Coast Coho Conservation Plan; ODFW 2007). Actions such as pipeline construction and maintenance with associated long-term disturbance introduce an added burden inhibiting ecological recovery. Pipeline stream crossings have the potential to negatively affect watercourse ecosystems through alteration of channel beds and banks, increasing total suspended solids (TSS), alteration of substrate size and quantity in the reach and changes to the immediate area benthic community. These impacts can result in deleterious impacts for fish due to decreased food availability, changes in foraging range increasing predation, aquatic habitat simplification, and decrease in overall health.

ODFW recommends robust emergency preparedness plans be developed for the long-distance HDD across Coos Bay (along with other waterway crossings) to prepare for catastrophic failures, and that these plans be developed in coordination with State of Oregon agencies including ODFW.

There are numerous critical concerns with placement of the pipeline on steep slopes and direct routing parallel to the slope. Coastal sandstone soils are highly susceptible to mass-wasting when undercut and generally disturbed. A relatively extensive access road network will be created to access the pipeline installation and facilitate pipeline maintenance, which will further create potential for mass-wasting slope failures and general sediment production over the current condition. Stream health related to anadromous fish production has largely been assessed to be predominantly “Poor” (Scale: “Very Poor”; “Poor; Fair”; “Good”; “Excellent”) in the Coos and Coquille River basins, with similar stream health conditions in the South Umpqua River basin. This “Poor” condition rating is largely related to upland disturbance increasing sediment loading and loss of riparian forest since 1900. Additionally, the proposed access road networks will likely have long-term chronic effects to fish and wildlife unless seeded, mulched, and closed. Sediment transport to streams is considered a substantial factor currently suppressing recovery of OC Endangered Species Act (ESA) threatened Coho salmon. Extensive research has documented the impacts of sediments to salmonids. Work to reduce sediment input into coastal and inland streams that will be impacted by the pipeline is foundationally critical for enhancing spawning and rearing habitat for fall Chinook salmon, Oregon Coast (OC) threatened Coho salmon, Pacific lamprey (Entosphenus tridentata), winter steelhead (O. mykiss irrideus) and coastal cutthroat trout (O. clarki clarki) as water quality is directly linked to hatch rates and food available for these species. Sediment loading above natural background levels contributes to embedding of substrates, which often results in reduced hatch rates for eggs in redds, inability of fry to emerge from redds, inhibited production of macroinvertebrates (invertebrates

largely live in the interstitial spaces of gravels), and impacts on the ability of fish to obtain food due to the nature of salmonids to feed predominantly by using their sight (Burns 1970; Hall and Lanz 1969; Weiser and Wright 1988; Suttle et al. 2004; Tripp and Poulin 1992; Waters 1995). For these reasons, ODFW recommends FERC and the Cooperating Agencies include ODFW in coordination discussions with NMFS to identify appropriate take mitigation strategies.

FERC should also be aware that Oregon Department of Forestry (ODF) fish presence/absence surveys represent "present conditions", and although highly useful, do not comprehensively represent historical fish usage as some watersheds have culvert barriers, man-made dams, etc. that are as of yet undocumented. For this reason, ODFW recommends coordination with ODFW to identify streams that should be surveyed, and where appropriate avoidance, minimization, and mitigation measures should be designed prior to construction.

Impacts to Marbled Murrelet and Northern Spotted Owl Habitat - ODFW is particularly concerned about the PCGP project's impacts to late-successional forest wildlife such as the marbled murrelet (MAMU) and the northern spotted owl (NSO). Both of these species are also listed as Threatened on the Oregon Endangered Species Act (ORS 496.171-192, also see OAR 635-100-0105). Both species are experiencing declines in higher-suitability habitat in Oregon. For example with regard to MAMU habitat, Raphael et al. (2016) estimated that higher-suitability habitat in Oregon declined from 853,400 acres in 1993 to 774,800 acres in 2012, a net loss of 78,600 acres (-9.2%). On federal lands, losses were mostly due to wildfire, whereas those on nonfederal lands were largely the result of timber harvest.

The DEIS does not acknowledge the state's authority (Section 1.5.2.5) and ODFW recommends this be rectified. The Oregon ESA's primary authority is related to state agency actions on state-owned or managed lands; and in so doing prohibits 'take' (killing or obtaining possession or control) without an incidental take permit. Where approval for take is given by USFWS, then this is taken as a waiver under Oregon ESA. ODFW defers to USFWS take permit determinations for species that are listed both at the state level and federally per the Endangered Species Act (ESA, 1973 as amended). ODFW can be more restrictive than the USFWS in its protection of listed species, but cannot be less restrictive. Moreover, ODFW can address habitat mitigation needs for listed species per the Oregon Wildlife Policy (ORS 496.12) and the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 435 Division 415), on both federal and non-federal lands (see *California Coastal Commission v. Granite Rock Co.*, 480 U.S. 572 (1987); 43 CFR 24.3(a) ("In general the States possess broad trustee and police powers over fish and wildlife within their borders, including fish and wildlife found on Federal lands within a State.")).

ODFW's understanding from reading the DEIS is that FERC and its Cooperating Agencies have not yet developed a biological assessment (BA) or begun consultation with the USFWS who has federal jurisdiction per the federal ESA. ODFW understands that consultation will fall under Section 7 for the federal action and for the federal lands within the project, but that Section 9 and Section 10 of the federal ESA will also apply to the non-federal portion of the project. The DEIS does not discuss how this consultation will occur on the non-federal portion of the project, or how this relates to FERC's authority and decision making for a project that crosses multiple land ownerships, and ODFW recommends this information be provided.

Based on the projected impacts to MAMU and NSO owl habitats, and the lack of inclusion of the USFWS Jordan Cove Conservation Framework (USFWS 2014, included in the FERC 2014 DEIS but absent from the 2019 DEIS), ODFW does not see how this project will avoid a determination of jeopardy and 'take'. According to the DEIS (Page ES-4), the pipeline would impact over 2,000 acres of forest including over 750 acres of late-stage old-growth forest that provides habitat to marbled murrelet, northern spotted owl, and other federally-listed and state-listed (ORS 496.171-182) threatened and endangered species. The federal ESA mandates that any project authorized by a federal agency should "not jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined…to be critical". The DEIS Section 4.6 (page 4-323-330) details the potential impacts to both MAMU and NSO, including clearance of large trees and understory essential for nesting habitat to create the pipeline right-of-way and for temporary work areas, as well as impacts from ambient noise and human disturbance. Furthermore, for the MAMU, which forages at sea, LNG carrier traffic and their associated impacts (ballast water, dredging, risk of fuel and lubricant spills, etc.) creates additional risk for the species. The DEIS describes the minimization measure proposed by the applicant to mitigate for these risks, which simply involves a timing restriction for tree removal within the breeding season. ODFW finds this measure to be inadequate, and looks to the suite of minimization and mitigation measures identified in the 2014 *Revised Conservation Framework for the Northern Spotted Owl and Marbled Murrelet: Jordan Cove Energy and Pacific Connector Gas Pipeline Project* (USFWS 2014) as essential to addressing the take and jeopardy anticipated with this project. Furthermore, ODFW contends that the amount of habitat removal for MAMU and NSO suitable or occupied habitat is not lawful without an incidental take permit developed under a federal Habitat Conservation Plan. ODFW recommends consultation with USFWS as soon as possible, and that the 2014 USFWS Conservation Framework be fully re-incorporated into the applicant's plans and into the FERC and Cooperating Agencies' NEPA process.

It is not clear to ODFW whether all of the MAMU habitat and NSO habitat has been surveyed throughout the project. ODFW understands that the applicant does not have access to some lands where the project is proposed. However, surveys are essential prior to disturbance in order to establish appropriate avoidance, minimization, and mitigation measures. ODFW recommends FERC require that MAMU surveys be conducted on all lands (federal and non-federal) according to the Pacific Seabird Group Protocol (Mack et al. 2003, revision pending), which requires at least two years of survey prior to construction. ODFW recommends full NSO surveys also be conducted according to protocol (USFWS 2012). Given ODFW's jurisdiction per the Oregon ESA, ODFW also recommends that the data resulting from those surveys be provided to ODFW as well as access to all information in the upcoming BA.

Fish and Wildlife Habitat Mitigation – ODFW recommends that aquatic and upland impacts to fish and wildlife habitats be addressed consistent with the Oregon Wildlife Policy (ORS 496.012) and implemented through the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0000 through 0025). This rule governs ODFW's provision of biological advice and recommendations concerning mitigation for losses of fish and wildlife habitat caused by development actions. Based on standards in the rule, the applicant seeks ODFW concurrence on the appropriate category to apply to land or water where a development action is proposed. If the habitat is Category 1, ODFW must recommend that impacts to the habitat be avoided. If impacts cannot be avoided, ODFW must recommend against the development action. If ODFW determines that such habitat is Category 2, ODFW must recommend that impacts to the habitat be avoided and if impacts cannot be avoided, ODFW must recommend a high level of mitigation (as specified in more detail in the rule). If such mitigation is not required,

ODFW must recommend against the development action. Subsequent specific mitigation goals follow for habitats determined to be Category-3, 4, 5 and 6, and for which impacts cannot be avoided.

In previous versions of the JCEP/PCGP project, the applicant was working cooperatively with ODFW to develop habitat mitigation plans for the LNG terminal area and for the pipeline. Draft plans included habitat categorization for areas of direct impact, and lists of potential mitigation options were in development. In the current DEIS, the habitat categorization is provided for the LNG terminal but not for the pipeline and is not taken further to identify mitigation obligations for those habitat categories that will be impacted. On Page 4-186 the DEIS states "*More details on these upland mitigation sites will be provided in a Wildlife Habitat Mitigation Plan that will be provided by the applicant as an appendix to their Comprehensive Mitigation Plan*". However the DEIS does not include any conditions of approval requiring completion of this work and mitigation that offsets the impacts. ODFW deems a mitigation plan essential to avoiding serious depletion of - and significant adverse impacts to - the fish and wildlife resources of the State of Oregon. Fish and wildlife habitat mitigation is also essential per the Oregon Wildlife Policy (ORS 496.12), and ODFW contends that this mitigation should pertain to both federal and non-federal lands. ODFW recommends that FERC include a condition requiring development of a fish and wildlife habitat mitigation plan in consultation with ODFW, and that mitigation commence concurrent with construction.

Since the inception of the JCEP/PCGP project, ODFW has been calling for a comprehensive mitigation plan that provides the public and the reviewing agencies with 'one-stop shopping' for all of the various mitigation pieces. The primary purpose of this comprehensive mitigation plan would be to ensure that all natural resource impacts are adequately addressed in a seamless fashion both geographically and jurisdictionally, in part to avoid duplication, but also in part to ensure nothing slips through the cracks. To date, a comprehensive mitigation plan has not been developed by the applicant and does not appear in the DEIS. ODFW recommends FERC, the Cooperating Agencies, and the USFWS work with the applicant and the State of Oregon natural resources agencies to develop a comprehensive mitigation plan. A comprehensive mitigation plan should follow the mitigation hierarchy of avoid, minimize, and mitigate and include at least the following components of mitigation to address:

- ESA listed species per USFWS and NFMS consultation in Section 7 and Section 10 processes,
- Migratory Bird Treaty Act species including golden and bald eagles,
- Marine mammals per the Marine Mammal Protection Act,
- Fish and wildlife habitat loss (on all land ownerships) per the ODFW Fish and Wildlife Habitat Mitigation Policy,
- Fish passage mitigation,
- In-water blasting impacts,
- Water quality/quantity mitigation per DEQ 401 Water Quality Permitting and through WRD Limited License Approvals,
- Wetland/waterway mitigation per DSL removal fill and US Army Corps of Engineers 404/408 permits,
- USFS, BLM, BOR, and USACE mitigation.

Oversight for implementation of this comprehensive mitigation plan could become part of the role for the NRTAG, see above.

ODFW acknowledges that some mitigation for fish and wildlife impacts has been identified in the DEIS, and

views this work as a good start. However, many habitats and the impacts to the State's fish and wildlife resources remain unaddressed through these measures. In particular, ODFW notes that mitigation for upland wildlife habitat impacts along the PCGP pipeline have not been addressed at all in the DEIS.

The DEIS identifies five mitigation areas, which ODFW addresses more specifically below.

1 – Compensatory Wetland Mitigation Plan and the Kentuck Slough Wetland Mitigation Project (information found at Chapter 2.1.1.9; Chapter 4.5.2.2; pgs 4-245 to 248; TABLE 4.11.3.1-1 (continued) Chapter 5.1.3.3 within the DEIS)

It should be noted that the numbers for waterbody crossings vary across documents. ODFW found differing numbers in the applicant's Compensatory Wetland Mitigation Plan (CWMP) as compared to the Applicant Prepared Biological Assessment. Those numbers differed again from the numbers reported in the FERC Resource Reports and those were again different from the DEIS. Recognizing that project design shifts over time while documents remain static depending on time of publication, it does make it difficult to assess impacts without consistent numbers as well as inconsistent definitions of waterbody (as opposed to the normal terminology used by the state for 'waterway' and 'wetland') and FERC's usage of the terms "coldwater" and "coolwater" which are not defined in the DEIS and which have no definition in State of Oregon regulations. ODFW recommends state definitions be used for the aquatic resources of the state (ORS 196.800 and OAR 141-085).

With regard to avoidance and minimization measures discussed in the plan, ODFW appreciates the applicant's efforts to co-locate facility components with existing infrastructure and previously disturbed areas where possible. ODFW supports the minimization measures and best management practices identified in the CWMP, but also directs FERC and the applicant's attention to the comments provided throughout this letter that would further help to minimize impacts to fish and wildlife habitats.

ODFW believes wetland impacts were underestimated for this project because the applicant did not consider temporary impacts in its calculations. Per OAR 141-085-0510(99), the Oregon Department of State Lands (DSL) treats temporary impacts as adverse impacts to waters of the state that are rectified within 24 months from the date of the initiation of the impact. DSL considers any impact duration longer than two-years as permanent, even though the US Army Corps of Engineers does not define temporary. The CWMP states that for the sake of consistency, the plan only addresses 'actual' permanent impacts and temporary impacts will be addressed in a separate site restoration plan. ODFW interprets this to mean that the applicant is considering anything less than a permanent impact to be temporary and therefore not requiring a mitigation offset. This interpretation does not meet the ODFW Fish and Wildlife Habitat Mitigation Policy which directs ODFW to consider the nature, extent, and ***duration*** of impacts and that offsets should persist for the life of the impact. Because of the 'duration' language in the mitigation policy, ODFW bases its recommendations not only on the physical loss of habitat, but also the length of time for which that habitat is unavailable to fish and wildlife (referred to as temporal loss of habitat). Impacts that the applicant might consider temporary in nature might actually result in temporal loss of habitat that should be mitigated in order to prevent depletion of a species with short generational turnover, and to meet the mitigation policy's goal of 'no net loss'. ODFW contends that unavoidable impacts (i.e., greater than two years) should be addressed in the CWMP.

ODFW notes that mitigation for the unavoidable impacts to freshwater wetlands along the 229-mile pipeline will be consolidated into the uppermost 10 acres of the Kentuck Mitigation Site in Coos Bay. ODFW reviewed the

section of the CWMP that discussed the reasoning for consolidation (page 2). The ODFW Fish and Wildlife Habitat Mitigation Policy recommends in-proximity mitigation for impacts to Habitat Categories 2 and 3. Since the CWMP did not provide a categorization of habitats for the pipeline, ODFW is not clear whether and/or how in-proximity mitigation options were considered and found to be untenable, or that the Kentuck option provided greatest overall net benefit to Oregon's wetland resources.

ODFW notes that the Kentuck Wetland Mitigation Project forms the basis of mitigation in the CWMP for all estuarine and freshwater wetland mitigation impacts associated with the LNG facility and the pipeline. Overall, ODFW supports the Applicant's proposal for restoration at Kentuck Slough because, if successful, the project will improve the quality and diversity of rare estuarine habitats as well as freshwater habitats.

The Kentuck mitigation site is approximately 100 acres in size. The current mitigation plan proposes a network of tidal channels and removal of a segment of East Bay Drive in order to connect these channels to Coos Bay tidal inflow/outflow. Additionally a portion of Kentuck Creek streamflow will be guided through the new channel network using a modestly complex configuration of culverts and tidegates. The habitats at the Kentuck site have been diked, drained, tidegated, cultivated, grazed, and stream networks channelized since the late 1800's resulting in substantial degradation of the ecological productivity. Historically the site would have been defined as Habitat Category-2 intertidal Algae/Mud/Sand habitats, under ODFW Fish and Wildlife Habitat Mitigation Policy. However, currently the function for native fish and wildlife species is considered Category-4 and 5 in some locations.

Mitigation restoration will reestablish natural hydrologic regimes to a substantial degree at the site, although the entrance of tidal flow will be truncated partially due to the limited opening through East Bay Drive and partial reintroduction of Kentuck Creek flow. Historically, full volume flood flows from Kentuck Creek would have been able to support a broader range of euryhaline conditions for native fish and wildlife. Additionally, tidal flows would have been a combination of sheetflow and channel flow prior to installation of East Bay Drive. The mitigation restoration proposes to establish tidal channel flow. However, without full removal of the length of East Bay Drive (which ODFW is not suggesting as an option), sheetflow will not be reestablished. As a result, full hydrologic connectivity will remain limited.

Algae-mud-sand habitats, as well as saltmarsh habitats are considered Habitat Category 2 per the ODFW Fish and Wildlife Habitat Mitigation Policy. The JCEP project impacts to intertidal habitats include primarily: Habitat Category 2 Intertidal Unvegetated Sand; Habitat Category 2 Shallow Subtidal; Algae/Mud/Sand; Habitat Category 2 eelgrass; and Habitat Category 3 Deep Subtidal. The majority (very roughly 82 acres; based on LiDAR evaluation) of the Kentuck Slough within the proposed mitigation area is currently below elevation 5.0ft MLLW. Excavation of a tidal channel through East Bay Drive with the current elevations within the mitigation area would allow nearly all lands within the site to be inundated with the majority of tides. The JCEP project proposes using the Kentuck Mitigation site for dredge material disposal (300,000 CY) that would elevate a substantial proportion of the project area above elevation 5.0ft MLLW, which decreases the land area that will be inundated regularly and prevents inundsation with the majority of tides. However, ODFW recognizes the potential for the higher elevation areas as a result of the fill to eventually vegetate to saltmarsh ecotype, which is considered high in value and limited in Coos Bay.

While there may be sufficient acreage at this site to meet the Oregon DSL's standard for a 3:1 restoration ratio as a result of the dredging impacts at the JCEP site, a number of potential impacts (e.g. salinity gradient issues, changes in bay turbidity, creation of a deepwater zone) that will occur due to construction of the JCEP will not be compensated in-kind as the salinity gradients are out of the range that is present at the project location.

Public access is currently not allowed at the Kentuck Mitigation site, however, it is allowed on the water at the North Spit and South Dunes portions of the bay. Recreational access to the estuary and shoreline habitats of the bay is an important component of the local economy. It is expected that the security zone in the JCEP project area following construction will significantly reduce public use of the bay and adjacent uplands, and the Kentuck Slough will likely see increased public recreation interest for clamming and birding. JCEP will need to work with ODFW and other relevant state agencies to determine appropriate recreation management strategies that address the lost recreation opportunity while sustaining the likelihood of success of the mitigation efforts.

Saline waters will move upstream into the Kentuck mitigation site via restoration actions allowing more viability of mariculture (i.e. Pacific oyster farming). The effective area available for expansion of mariculture will not only be within the new mitigation site, but there will also be an increase in the particle range (i.e. drift of Oyster spat) of these operations up bay. The spread of the footprint of mariculture operations just down Bay (defined as within ¼ mile) from the mitigation site may retard the creation of this restored estuarine habitat in Kentuck Slough. These types of mitigation may not be effective in the context of future expansion of mariculture which would likely defeat mitigation goals. Although it will likely be practical for oyster cultivation on the mitigation site, this would be counter-productive to the intended goals of mitigating for fish and wildlife. ODFW recommends careful consideration of restricting commercial oyster cultivation from the Kentuck mitigation site as a condition of the FERC approval.

ODFW also requests that FERC require coordination between JCEP/PCGP and ODFW during the development/construction of the Kentuck Mitigation site, so that ODFW will be able to provide JCEP/PCGP with recommendations for the planning, construction, and long-term monitoring of the ecological functions.

2) Eelgrass Mitigation Plan (DEIS Section 4.3.2.1, and see *Jordan Cove Energy Project Compensatory Wetland Mitigation Plan* filed with the FERC in May 2018)

Native eelgrass is recognized by ODFW as a Habitat Category 2, and the ODFW goal is no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or quality (OAR 635-415-0025). To achieve the mitigation goal, ODFW recommends avoidance of the impacts through alternatives to the proposed development action, or mitigation of the impacts (if unavoidable) through reliable in-kind, in proximity habitat mitigation to achieve no net loss of either pre-development habitat quantity or quality.

In order to offset the loss of 1.9 acres of eelgrass, the JCEP includes a proposed eelgrass mitigation plan that relies on the “best case scenario” for full success by creating 6.03 acres of eelgrass (3:1 ratio) within a 9.34 acre site in the intertidal zone near the impact area. ODFW has noted a number of potential issues associated with the proposed JCEP mitigation plan that have not been considered/addressed fully by the applicant.

The DEIS does not demonstrate that serious consideration has been given to avoidance of the impacts to eelgrass beds. In this regard, the JCEP Mitigation Plan should describe the alternative sites that were considered, characterize the location, species composition, and abundance of the eelgrass and other submerged aquatic vegetation at the alternative sites, and provide the rationale for rejection of the alternative sites and preference for the proposed site. The existing JCEP Mitigation Plan is incomplete because it does not provide a full description of the steps that were taken to avoid adverse impacts to existing eelgrass beds in Coos Bay.

The proposed eelgrass mitigation plan does not give serious consideration to the difference in habitat quality that is anticipated between the eelgrass impact area and the eelgrass mitigation site. The plan proposes to excavate 9.34 acres of existing algae/mud-sand algae habitat located in the intertidal zone near the North Bend Airport to an elevation of -2.00 ft NAVD, and to convert the algae/mud- sand habitat into 6.03 acres of eelgrass. The proposed conversion of algae/mud-sand habitat to eelgrass habitat is problematic, because eelgrass and algae-mud-sand is also recognized as Habitat Category 2 value habitat under ODFW Fish and Wildlife Habitat Mitigation Policy. While these habitats are both considered as Habitat Category 2, they provide different functions and values. Accordingly, diminishing the quantity and quality of algae/mud-sand habitat in order to offset the loss of eelgrass habitat is not 'in kind' and does not create a 'net benefit', and therefore does not meet the ODFW Fish and Wildlife Mitigation Policy goals for Habitat Category 2.

Earlier attempts to mitigate for the damage or loss of eelgrass beds have met with limited success in Pacific Northwest estuaries. For example, Thom et al. (2008) conducted a review of 14 eelgrass mitigation and transplant projects, and they concluded that it is sometimes possible to restore eelgrass under favorable site conditions when the reason for the initial loss of eelgrass is understood and corrected. The authors also noted, however, that eelgrass restoration science is hampered by knowledge gaps which reduce restoration success. The underlying mechanisms for recent eelgrass loss in the Pacific Northwest region are not obvious, which suggests that the scientific understanding of eelgrass biology and ecosystem conditions is currently inadequate to fully support environmental management actions (Thom et al. 2008).

There are often hydrologic flow regime complexities that affect potential for success in eelgrass restoration:

- Habitat conditions created through excavation or filling are often ephemeral and subject to subsequent deposition/erosion that results in movement of conditions outside of the range of preferred variability for eelgrass.
- Flow regimes including severity of wave action and current speed contribute to the potential success of a site for eelgrass establishment and growth. Sites that are created through excavation or fill are an artificial modification of conditions that have formed through the geomorphological features that drive flow regimes. Factors such as water depth reflect deposition/erosion rates from water transported sediments. Excavation or filling to a specific elevation is attempting to alter the natural elevation conditions in relation to hydrologic conditions for many sites that might serve as potential mitigation. Resultantly there is limited potential for success of projects that modify water depth/elevation of the substrates for creating conditions appropriate for eelgrass mitigation unless the site chosen has substrate elevation that has been artificially created from previous disturbance or the conditions are dominated by factors other than hydrology.
- Use of eelgrass sites immediately adjacent to or within the mitigation area for obtaining plants/shoots results in impacts to these locations, potentially weakening the vigor of eelgrass at these locations which is counter to goals.
- Excavation of locations adjacent to existing eelgrass beds can result in hydrologic changes such as erosion of surrounding substrates resulting in impacts to currently productive stands.
- The monitoring plan should include more robust methods such as diver or low tide visual count surveys with established known planting densities at time-0 and subsequent measurable surveys with quantifiable methods.
- Due to the potential for minimal success the eelgrass mitigation ratio is likely insufficient to offset impacts at the JCEP project impact location.

For all of the reasons listed in the discussion above, ODFW recommends the eelgrass mitigation strategies be re-evaluated to favor avoidance.

3, 4, and 5) Panhandle, Lagoon, and North Bank Mitigation Sites (Section 2.1.1.9 in the DEIS)

The DEIS reports three upland habitat mitigation sites. The Panhandle site is approximately 133 acres and is located north of Trans-Pacific Parkway. The Lagoon site is approximately 320 acres and is located adjacent to the meteorological station. The North Bank site is approximately 156 acres and is located on the north bank of the Coquille River adjacent to the Bandon Marsh National Wildlife Refuge (NWR). ODFW is aware of these locations and acknowledges that these sites have been part of preliminary discussions with JCEP/PCGP about potential mitigation sites. During those discussions, ODFW expressed reluctance to accept those sites as appropriate mitigation because much of the habitat types were out-of-kind. For example, ODFW expressed reluctance over the North Bank land purchase as complete mitigation for the loss of forested dune habitat (coastal marten Category 2 shore pine habitat), because the North Bank site is largely Douglas fir forest and not shore pine forest. Without a habitat mitigation plan that details categories of habitat impacts by the LNG facility and how these mitigation sites offset the functions and values being lost, it is difficult for ODFW to determine if these sites will meet the criteria outlined in the ODFW Fish and Wildlife Habitat Mitigation Policy. ODFW recommends these sites be evaluated in coordination with ODFW as part of a larger habitat mitigation planning effort.

Additional Mitigation Recommendations

- **MAMU and NSO Habitat and the ODFW Fish and Wildlife Mitigation Policy**

The DEIS identifies seasonal restrictions for tree removal and construction activity as the only mitigation measure to address impacts to MAMU and NSO habitat. ODFW finds this wholly inadequate for avoiding take and jeopardy of both species given the significance of predicted impact (see comments above) and federal ESA obligations. The proposed seasonal restrictions are a minimization measure that does not address the net loss in habitat. ODFW had expected these species to be foremost in a comprehensive mitigation plan for the JCEP/PCGP project. However, that plan has not been included in the DEIS. ODFW recommends a comprehensive mitigation plan be developed that includes adequate measures to achieve the goals of avoidance, as well as no net loss and net benefit. In addition, the mitigation plan should be developed for all land ownerships, consistent with the recommendations provided below and with the guidance provided by the USFWS in the 2014 Conservation Framework.

In the 2014 version of the PCGP project, a habitat categorization effort was underway with the PCGP's biological consultants. In the current project, PCGP has stated verbally their plan is to continue using that previous work to develop a wildlife habitat mitigation plan for the pipeline. However the DEIS does not provide any indication that this effort or evaluation has been initiated or developed. PCGP has also met with ODFW in early 2019 to discuss potential revisions to the categorization of Category 1 habitat for MAMU. ODFW requested additional information prior to providing feedback to PCGP. That data request included access to Appendix Z from the Applicant Prepared Draft Biological Assessment (provided to the FERC docket in September 2018), as well as greater detail on the definitions and methods used to delineate potential MAMU habitat, and spatially-explicit information on survey areas and results. At this time, the applicant has provided ODFW with a qualitative description of methods and results but has not provided ODFW with the previously requested information (Appendix Z, the spatially-explicit information). Until that information is provided and reviewed by ODFW, ODFW continues to provide the following recommendations.

In the ODFW Fish and Wildlife Habitat Mitigation Policy, Habitat Category 1 is irreplaceable, essential habitat for a fish or wildlife species, population, or a unique assemblage of species and is limited on either a physiographic province or site-specific basis, depending on the individual species, population or unique

assemblage. The mitigation goal for Category 1 habitat is no loss of either habitat quantity or quality. For Category 1 habitat, ODFW recommends avoidance of impacts through alternatives to the proposed development action; or no authorization of the proposed development action if impacts cannot be avoided (OAR 635-415-0025(1)(b)).

For the NSO, the nesting habitat for the owl is extremely limited on a physiographic basis, and the structural characteristics of their nesting sites (old growth trees, complex understory, available prey base, connectivity of habitat) are irreplaceable within the life of this project. . Therefore, ODFW deems the 70-acre nest patch as Habitat Category 1 (consistent with the Oregon Forest Practices Act ORS 197.277 and OAR 629 Division 665, as well as the federal ESA). ODFW recommends avoidance of any habitat loss within presumed-occupied and occupied nest patches (as per protocol-level survey – see above) for the NSO. This recommendation applies to any season, not just the active breeding season, especially given the NSO's strong nest site fidelity.

The DEIS states "*The Project would affect habitat within 97 NSO home ranges and 9 nest patches. About 37 miles of pipeline route would cross 7 designated critical habitat sub-units. Project construction would remove a total of about 517 acres of nesting, roosting, or foraging (NRF) habitat for NSO, of which 134 acres would be permanently lost within the 30-foot-wide corridor maintained in an herbaceous state. Additionally, 214 acres of NRF habitat for NSO would be modified and used as UCSAs. Approximately 1,158 acres of dispersal habitat (high NRF, NRF, and dispersal only habitat) would be removed by the Project. Approximately 919 acres of NSO capable habitat would be removed by construction of the proposed Project, of which 216 acres would remain in a permanent herbaceous/shrub state within the 30-foot operational ROW. Approximately 13,294 acres of NSO habitat (1,307 acres of high NRF/NRF habitat, 4,147 acres of dispersal only habitat, and 5,690 acres of capable habitat) occur within 100 meters (328 feet) of habitat removal, of which 4,326 acres (or 32.5 percent of NSO habitat within 100 meters of habitat removal) of interior NSO habitat would be indirectly affected (1,586 acres of high NRF/NRF habitat, 1,388 acres of dispersal only habitat, and 1,352 acres of capable habitat). The Pacific Connector Pipeline Project would remove 442 acres from LSRs , of which 379 acres is NSO habitat or capable of becoming NSO habitat (approximately 69 acres of high NRF, 93 acres of NRF [includes about 9 acres of "post-fire" NRF], 71 acres of dispersal only habitat, and 146 acres of capable habitat)".*

ODFW does not support any impact within the 70-acre nest patch and believes allowance of such activities will result in net loss of habitat and 'take' per the federal ESA and potentially per the Oregon ESA if NSO are physically harmed in the process. Therefore, ODFW recommends the PCGP project explore alternatives that avoid direct impacts and habitat loss within NSO nest patches, as those impacts are not mitigatable.

Beyond the NSO nest patch, ODFW defines the remainder of Nesting Roosting Foraging Habitat (as defined in the USFWS 2014 Conservation Framework) as Category 2 habitat. While avoidance and minimization is prioritized, impacts to Category 2 habitat are mitigatable at the high standard of 'no net loss of either quantity or quality and to provide a net benefit in habitat quantity or quality'. To meet that mitigation goal, ODFW recommends those acres in Nesting Roosting and Foraging Habitat (beyond the 70-acre nest patch) be identified as Category 2 habitat and that mitigation strategies be developed consistent with the guidance provided by the USFWS in the 2014 Conservation Framework.

Similar to the NSO, nesting habitat for the MAMU is extremely limited on a physiographic basis, and the structural characteristics of their nesting sites (primarily mature and old growth trees, the presence of nesting platforms, complex understory, and connectivity of habitat) are irreplaceable within the life of this project. For this reason, ODFW considers occupied MAMU sites (as defined by Mack et. al. 2003) Category 1

habitat in the context of an impact such as the PCGP project. According to Mack et al. 2003 an occupied site would be where protocol level surveys were performed for a minimum of two years in suitable habitat, and where a sub-canopy detection of a MAMU was made. The extent of the occupied habitat is based on all suitable habitat encountered until interrupted by a 100-meter break in habitat continuity. ODFW recommends avoidance of any habitat loss within occupied MAMU habitat. This recommendation applies to any season, not just the active breeding season, especially given the MAMU's strong nest site fidelity. These recommendations should apply to all land ownerships, as they match what ODFW would recommend to state agencies per OAR 635-100-0137.

The DEIS states "*Construction of the Project would remove a total of about 806 acres of MAMU habitat (suitable, recruitment, capable), including about 78 acres of suitable habitat removed from 37 stands (18 occupied MAMU stands and 19 presumed occupied stands). There is the potential that effects could extend over a total of about 7,145 acres of suitable nesting habitat in the terrestrial nesting analysis area (i.e., the extent of disturbance/disruption of MAMU during the breeding season; FWS 2014c), where Project-related noise, primarily use of access roads, may affect MAMU behavior, including breeding activities. HDD and DP activities are not anticipated to disturb nesting MAMU as noise associated with this work would attenuate to ambient levels before reaching MAMU stands. Ten occupied and 24 presumed occupied MAMU stands occur within CHU OR-06 (b, c, and d) within the proposed terrestrial nesting analysis area. Overall, construction of the Pacific Connector Pipeline Project would remove about 4 acres of suitable MAMU nesting habitat (PBF- 1) and about 12 acres of recruitment habitat and 15 acres of capable habitat (both of which make up PBF-2) within CHU OR-06-d*". Impacts would occur in the form of tree removal, trenching, ROW maintenance, noise disturbance, by the PCGP project. However, it is not clear whether PCGP had access to all potentially suitable habitat for surveys. ODFW believes allowance of any impacts in MAMU occupied nesting habitat will result in net loss of habitat and 'take' per the federal ESA and potentially per the Oregon ESA if MAMU are physically harmed in the process. Therefore, ODFW recommends the PCGP project explore alternatives that avoid direct impacts and habitat loss within occupied MAMU nesting habitat, as those impacts are not mitigatable.

Beyond the Category 1 occupied MAMU nesting habitat, ODFW considers suitable MAMU nesting habitat (where structural characteristics exist but sub-canopy detections were not made) to be Category 2 habitat given its essential and important role as potential MAMU nesting habitat (and to account for missed detections of elusive birds). While avoidance and minimization is prioritized, impacts to Category 2 habitat are mitigatable at the high standard of 'no net loss of either quantity or quality and to provide a net benefit in habitat quantity or quality'. To meet that mitigation goal, ODFW recommends those acres in suitable MAMU nesting habitat be identified as Category 2 habitat and that mitigation strategies be developed consistent with the guidance provided by the USFWS in the 2014 Conservation Framework.

- **Snowy Plover Habitat**

ODFW defines snowy plover nesting and foraging habitat as Category 2 per the ODFW Fish and Wildlife Habitat Mitigation Policy (essential and limited, but can be replaced and enhanced). At a minimum, an area of beach/dune habitat, from 1-2 km in length north of the current nesting area (Oregon Dunes National Recreation Area) would be an appropriate set-aside to be managed for nesting snowy plovers). Habitat preparation and management (dune sculpting, physical removal and disposal of non-native beach grasses, predator management, and public outreach and control) would all be appropriate forms of mitigation uplift. These mitigation options are an opportunity to create a success story for snowy plover recovery and community engagement. ODFW recommends FERC require JCEP to coordinate with ODFW to develop

mitigation strategies to offset the direct and indirect impacts expected from this project, so that take/jeopardy determinations can be avoided in the Section 7 and Section 10 (if applicable) consultations.

- **Coastal Martens**

The JCEP LNG terminal would remove shore pine habitat that is important and limited for the coastal marten. The shore pine forest habitat that would be impacted by the JCEP is limited in abundance on the Oregon coast. While information on patterns of habitat use and distribution is still somewhat limited, it appears to ODFW that what is known about coastal marten distribution in the Coos Bay area seems to be based on the existence of this shore pine habitat type. Given the close proximity of known detections of coastal martens relative to the project area, the limited extent and importance of the habitat type, and the desire to keep martens off the endangered species lists, ODFW considers the forested dune in the JCEP project area to be Category 2 habitat. ODFW recommends FERC and JCEP/PCGP work cooperatively with ODFW to incorporate coastal martens into a fish and wildlife habitat mitigation plan.

- **Big Game Winter Range**

The PCGP project bisects a significant amount of big game winter range, which ODFW prioritizes given its importance to sustaining big game populations and its limited extent. ODFW has digitized biological winter habitats for mule deer, Rocky Mountain elk, and bighorn sheep in both eastern and western Oregon and has provided this information to PCGP previously (ODFW 2013, and 2017). ODFW recommends PCGP work with ODFW to ensure the best available science is used to assess and mitigate for impacts to big game. ODFW recommends that a comprehensive mitigation plan be developed for this project to ensure impacts are offset and serious depletion (see ORS 496.012) does not occur for Oregon's big game species. Examples of possible mitigation may include purchasing degraded properties within designated winter range and performing habitat improvement projects to mitigate for damage to winter range through likely noxious weed establishment and increased OHV activity. See Appendix A Table 3 for a list of possible improvement projects, and Figure 4 and Table 4 for a list of possible mitigation properties.

- **Other Sensitive Wildlife Habitats**

Oak woodlands are a unique and highly productive habitat that is limited in quantity. Oak Woodlands have been classified by ODFW under the agency Habitat Mitigation Policy (OAR 635-415-0000-00025) as Category 2. Many of these woodlands have critical function as winter range for big-game and meet life history needs for a variety of migratory birds (e.g. Acorn woodpeckers), forest herps and small mammals. Oak woodlands require a long-time (100+ years) to reach full productivity and function as habitat, and are a limited habitat type in Oregon. For these reasons ODFW recommends oak woodlands receive particular attention in the DEIS and that the Applicant work with ODFW to develop avoidance, minimization, and/or mitigation plans for this important habitat type.

Vernal pools are also a unique and highly productive habitat that is limited in quantity. Vernal pools, when functional, provide essential habitat for vernal pool fairy shrimp which are listed as Threatened on the federal ESA and which are an Oregon Conservation Strategy Species. Vernal pool fairy shrimp require vernal pools or similar, ephemeral pools to complete their life cycle. They prefer small pools with cold water. Prior to seasonal drying of the pools, females produce eggs ("cysts"). These cysts can dry out and lie dormant until pool re-filling occurs, at which time the eggs will hatch. There is little genetic variability within vernal pool fairy shrimp populations. Many vernal pools have been drained or have modified hydrology unsuitable for

fairy shrimp. Remaining pool habitat is increasingly isolated. Stormwater run-off containing pesticides, chemical residues, and other contaminants are also harmful to vernal pool fairy shrimp. For these reasons ODFW considers vernal pool habitat to be Category 2 and recommends they receive attention in the DEIS and that the applicant work with ODFW to develop avoidance, minimization, and/or mitigation plans for this important habitat type.

- **General Inequity of Mitigation between federal and non-federal lands in the DEIS**

ODFW notes that the DEIS identifies that non-federal lands make up approximately 70+% of the area affected by this pipeline. Yet most or nearly all the mitigation recommended through the document is on federal lands. ODFW recognizes the federal agencies were Cooperating Agencies, and that many of the projects outlined on federal land had previous planning from internal agency effort. However, ODFW recommends the DEIS recognize the ecological gap created by impacted habitats at a location and conducting mitigation that may be out-of-kind or out-of-proximity. These types of issues create complications for ecological function in relation to compensating for impacts. ODFW finds that much of the federal land mitigation discussed in the DEIS for would not meet the goals of the ODFW Fish and Wildlife Mitigation Policy, and notes that the DEIS refers to the 'POD' which ODFW was unable to locate.

In Section 2.1.5 the DEIS discusses how USFS mitigation plans are programmatic, and may include projects where NEPA is not complete. Completion of additional NEPA for these mitigation options could take years beyond the construction of the JCEP/PCGP project. ODFW recommends that mitigation occur prior to or concurrent with the development action (OAR 635-415-0025).

Table 2.1.5-1 lists mitigation actions for USFS lands. These actions were identified by USFS to address the Aquatic Conservation Strategy, habitat for federally listed species, Late Successional Reserves, compliance with the various Forest Plans, as well as specific resource issues by watershed. Given these criteria for identifying mitigation, not all projects listed in the DEIS for USFS lands are designed to offset the losses of fish and wildlife habitat and therefore do not achieve the goals of no net loss and net benefit as set forth in the ODFW Fish and Wildlife Habitat Mitigation Policy. To remedy this issue, again ODFW recommends FERC condition their approval such that JCEP/PCGP works with ODFW, the federal agencies, tribes, and other relevant state natural resource agencies to develop a comprehensive mitigation plan that aligns with the ODFW Fish and Wildlife Habitat Mitigation Policy.

Fish Passage - It is the policy in the State of Oregon to provide upstream and downstream passage for native migratory fish (see ORS 509.580 through 509.910 and corresponding Administrative Rules OAR 635-412-005 through 0040). Fish passage is required in all waters of Oregon in which native migratory fish are currently or were historically present. With some exceptions defined in ORS 509.585, a person owning or operating an artificial obstruction may not construct or maintain any artificial obstruction across any waters of this state that are inhabited, or historically inhabited, by native migratory fish without providing passage for these fish. Projects that construct, install, replace, extend, repair or maintain, and remove or abandon dams, dikes, levees, culverts, roads, water diversion structures, bridges, tide gates or other hydraulic facilities can be "triggers" to Oregon's fish passage rules and regulations. Specific information relating to Oregon Fish Passage Law can be viewed on our website at the flowing location: http://www.dfw.state.or.us/fish/passage/

At this time, ODFW has received Fish Passage Plans for the portion of the project located within the Coastal Zone Management Area (CZMA). ODFW has not received detailed fish passage design plans for the rest of the pipeline and its associated infrastructure.

In April 2019, ODFW received the PCGP fish passage plan for pipeline and stream crossings within the CZMA. This fish passage plan submittal included approximately fifty eight (58) locations where the proposed 229-mile long, 36-inch diameter natural gas pipeline would intersect waterways in Coos and Douglas Counties. As proposed, four (4) of the 58 waterway crossings would be Horizontally Directionally Drilled (HDD) and the remaining would be open trench installations. Open trench natural gas pipeline installations generally consists of either a flume or a dam and pump water management installation method. Additionally, at each pipeline crossing except the HDD installations, temporary water crossing structures (bridges) would be necessary at all locations to facilitate project construction and pipeline installation.

ODFW also received a Fish Passage Plan for a road-stream crossing for a temporary bridge installation at MP 44.29 (Upper Rock Creek). This submittal package was for a temporary bridge structure to provide construction equipment access to the proposed pipeline route where access is presently inaccessible.

Finally, ODFW also received a JCEP fish passage plan for the Kentuck-APCO estuarine habitat restoration at the Kentuck mitigation site in Coos County on March 2019. This packet addressed five (5) primary compensatory restoration actions as a result of impacts associated with the JCEP export liquefied natural gas terminal. These five actions include fish passage plans for:

- East Bay Drive Bridge,
- Golf Course Lane Culvert,
- Kentuck Tide Gate,
- Kentuck Creek Restoration, and
- APCO Bridge

Based on the materials received to date (described above), ODFW does not have sufficient data, information and design details necessary to process and authorize the state's fish passage approvals for the various project components where ODFW has fish passage authority.

General areas where insufficient information, data and design details exists include:

- Streambed and stream bank restoration best management practices at high risk pipeline sites
    - Limited to no fish passage engineering design details exist for these high risk sites
- Short and long term post project monitoring, evaluation and reporting for all project sites associated with pipeline and restoration actions
- Temporary water management and fish passage during pipeline installation at sites determined "high risk" by ODFW
    - Presently at sites where dam and pumping water management strategies will be implemented, no fish passage is proposed during construction. Further discussion is necessary for some of the sites determined by ODFW to be high risk for passage of native migratory fish species.

Downstream fish passage during project implementation for high-risk sites determined by ODFW will be required.

- As identified in the pipeline installation plans, no in-water blasting is proposed. There are conflicts with some of the design detail notes where it appears in-water blasting may be necessary and "at the direction of the engineer and to be determined during project construction". Any and all in-water blasting requires a blasting plan to be submitted to ODFW (as per ORS 509.140). Additional discussions and design details are necessary with the project design team regarding in-water blasting plans associated with pipeline installation.
- Kentuck – APCO Project Site – numerous design details continue to be developed by the design team associated with the proposed tide gate structure and other restoration components of this proposed action. These include:
    - Ownership, long-term operational and maintenance responsibilities, water management plans, final engineering design details of East Bay Drive Bridge and tide gage, temporary water management, work area isolation, fish salvage and removal and fish passage during project implementation

Just as the ODFW fish passage application is not yet sufficient, the FERC DEIS also does not elaborate on this necessary fish passage information. Without consideration for the details enumerated above, the project does not demonstrate its ability to provide adequate fish passage, and therefore ODFW contends the JCEP/PCGP project has the potential for significant impact on native fish who rely on fish passage for population maintenance. Given the insufficient information for fish passage in the DEIS, ODFW questions FERC's determination of no significant adverse impact.

ODFW recommends the JCEP/PCGP applicant work with ODFW to provide the additional necessary data and information for the fish passage plans received to date. Furthermore, ODFW recommends JCEP/PCGP submit the fish passage plans for the remainder of the project assuming there are a number of stream crossings beyond the CZMA that will trigger Oregon's fish passage rules.

ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW and receive approvals under Oregon Fish Passage Fish Passage Law (ORS 509.585) for each individual stream crossing which triggers this policy prior to authorization of project construction.

In-Water Work/In-Water Blasting – The JCEP/PCGP project will involve construction work within waters of the state inhabited by fish and aquatic wildlife. ODFW has guidelines for appropriate timing of in-water work which can be found at http://www.dfw.state.or.us/lands/inwater/. These guidelines provide a way of planning in-water work during periods of time that would have the least impact on important fish, wildlife, and habitat resources. Specific recommendations related to in-water timing are also briefly discussed in the comment tables below, however ODFW recommends FERC require the Applicant to work with ODFW to identify appropriate in-water timing windows on a site-specific basis and according to the above guidelines and pursuant to ORS 509.140 and implemented through OAR 635 Division 425.

As required by OAR 635-425-0000 through 0050 (In-water Blasting Permits) the project shall apply for in-water blasting permits at any stream crossing locations where the use of explosives is desired in the course of removing any obstruction in any waters of this state, in constructing any foundations for dams, bridges, or other structures, or in carrying on any trade or business (OAR-635-425-0005). Further, it is the policy of the Oregon Fish and Wildlife Commission to discourage in-water blasting unless it is the only practicable method to accomplish project goals. ODFW may issue in-water blasting permits only if they contain conditions for preventing injury to fish and wildlife and their habitat (OAR 635-425-0015).

The applicant has engaged ODFW in discussions regarding the need for and intent to apply for in-water blasting permits before construction begins, however specific locations and details had not been discussed nor has ODFW received any in-water blasting applications. In those discussions the applicant informed ODFW that in-water blasting would not be undertaken with the Coastal Zone. However, the DEIS and the applicant's fish passage applications submitted to ODFW in April 2019 indicate that in-water blasting may be performed at sites to be determined during construction at the discretion of the project engineer. In fact the DEIS Section 4.6.1.3 discusses the potential for 13 blasting sites within the Southern Oregon Northern California Coho (SONCC) Essential Salmonid Unit (ESU), and another 22 blasting sites within the Oregon Coast coho ESU, both of which are in the coastal zone.

In-water blasting has the potential to injure fish and aquatic wildlife due to percussive shock waves produced by the energy associated with the explosion. This percussion can cause direct injury and stressors including bursting of swim bladder, hemorrhage, damage to sensory organs, and trigger displacement behavior in fish species. Given the significance of the impact, ODFW only issues blasting permits when the applicant demonstrates that all alternatives to blasting have been considered, and that this method is the least impactful to fish, wildlife, and their habitats. If blasting is unavoidable, ODFW expects applicants to identify appropriate mitigation offsets pursuant to the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635 Division 415).

ODFW understands the applicant has not been able to physically access all stream crossing locations preventing the collection of necessary site-specific geotechnical information necessary to determine if in-water blasting is the only practicable method. However, the DEIS lacks an assessment of alternatives to blasting and lacks a thorough description of the significance of the blasting effect. The DEIS states that fish salvage prior to blasting will offset the impact but goes on to acknowledge that coho are particularly sensitive to electroshocking and handling without providing any comparative analysis of this minimization measure. Furthermore, the DEIS does not identify any compensatory mitigation options when avoidance and minimization cannot be achieved.

ODFW recommends this issue receive further consideration and analysis, given the high potential for significant adverse impact, between the draft and the final EIS. ODFW also recommends that FERC condition any approval such that the JCEP/PCGP applicant will have applied for and received any in-water blasting approvals from ODFW prior to beginning construction.

Specific Comments

In addition to the comments provided above, ODFW offers the following more site-specific comments in tabular form. These comments are a compilation of input from ODFW Fish and Wildlife Districts over the last 11 years that the JCEP/PCGP project has been proposed, in its various iterations. Table 1 includes ODFW comments and recommendations specific to the JCEP LNG Terminal and the Coos Bay Estuary. Table 2 includes ODFW comments and recommendations specific to the PCGP Pipeline. ODFW has attempted to update page and section numbers, and new information is added as necessary throughout both tables.

JCEP LNG TERMINAL SPECIFIC COMMENTS:

Citation	Issue Identification	Recommended Resolution
Table 1.5.1-1	**US Army Corps of Engineers Consultations:** In Table 1.5.1-1 the DEIS does not make mention of the US Army Corps of Engineers' jurisdiction and management authority on a parcel of land on the North Spit at Coos Bay. This has implications for snowy plover protection and management.	**US Army Corps of Engineers Consultations:** ODFW recommends Table 1.5.1-1 be corrected to include the US Army Corps of Engineers management authority for the parcel of land on the North Spit, specifically with regard to Section 7 ESA consultation for snowy plovers.
	US Fish and Wildlife Service Jurisdiction per the Endangered Species Act: Table 1.5.1-1's treatment of USFWS jurisdiction per Section 7 of the ESA does not describe their authority adequately. Take of listed species is always prohibited unless it is specifically permitted.	**US Fish and Wildlife Service Jurisdiction per the Endangered Species Act**: ODFW recommends Table 1.5.1-1 be corrected to more adequately describe the authority and Agency Action associated with Section 7 of the ESA. Furthermore, there is no mention of Section 10 authority regarding federally listed species and incidental take on non-federal lands. ODFW recommends this also be discussed in the table.
	Oregon Endangered Species Act (ORS 496.171-192) is omitted from Table 1.5.1-1: The table does not list the Oregon Endangered Species Act. The OESA's primary authority is related to state agency actions on state-owned or managed lands; and in so doing prohibits 'take' (killing or obstaining possession or control)	**Oregon Endangered Species Act (ORS 496.171-192) is omitted from Table 1.5.1-1:** To ensure that any state agency actions associated with this project do not overlook their obligations per the OESA, ODFW recommends Table 1.5.1-1 be updated to include reference to this statute.

	without an incidental take permit. Where approval for take is given by USFWS, then this is taken as a waiver under OESA.	
Section 1.5.2.5	**Omission of reference to Oregon Endangered Species Act (ORS 496.171-192):** This section does not describe ODFW authority for state-listed species. Furthermore, this section refers to the state's Wildlife Diversity Plan. Although the plan still exists, the Oregon Conservation Strategy is the wildlife conservation blueprint for ODFW and the State of Oregon as a whole.	**Omission of reference to Oregon Endangered Species Act (ORS 496.171-192):** ODFW recommends this section be updated to include reference to OESA. Please replace reference to the Wildlife Diversity Plan with Oregon Conservation Strategy. www.oregonconservationstrategy.org.
Chapter 2.1.1.6; pgs 2-10-17	**Maintenance of the slip:** It is unclear if the Port of Coos Bay will maintain access channel depth into Slip. Will this become part of the Port's Unified Dredging Permit, which maintains the depth of several access channels and vessel berths connected to, but outside of, the navigational channel? Port has recently been granted extensions outside of the ODFW-recommended in-water work windows for the Unified Permit, despite ODFW's request to dredge only within the window to protect estuarine resources.	**Maintenance of the slip:** ODFW recommends clarification of whether or not the access channel dredging and maintenance dredging will be part of Port of Coos Bay's Unified Dredging Permit. ODFW recommends all dredging of the portions of the project outside of the footprint of the current federal navigation channel or within the current upland be fully isolated from the bay by the proposed soil berm, and occur only with in the ODFW' in-water work window: http://www.dfw.state.or.us/lands/inwater/
Chapter 2.1.1.6; pgs 2-10-17; Chapter 4.6.1.3; pgs 4-330 to 4-441	**Direct Construction and Maintenance Dredging Impacts:** Lethal and non-lethal impacts to marine fish, crab, shrimp, bivalves, juvenile Chinook salmon, white sturgeon; ESA listed coho salmon, green sturgeon, and Pacific eulachon; as well as non-listed Pacific lamprey, and other species may occur:	**Direct Construction and Maintenance Dredging Impacts:** ODFW recommends: • During the initial dredging and excavation, monitoring of the dredge output at the storage site, ODFW recommends the Applicant access/estimate the magnitude (quantification of organisms in the dredge spoils) of impact to shellfish and non-game/game fishes.

	• Through entrainment in the hydraulic dredge at the time of the initial construction. • Be impacted by entrainment during future maintenance dredging required to keep the berth and access to the berth serviceable. • Become attracted to the alcove and away from natural habitats, introducing risk of industrial impacts to these species (e.g. metabolic expenditure from disturbance; entrainment into cooling intakes, entrainment into ship ballast water intakes). • The access channel from navigational channel to terminal is approx. 30 acres; will dredge 1.4 MCY; turbidity will likely last for 4-6 months; "localized". Four to six months could affect the life history of several estuarine species (fish and invertebrates), depending on timing. ODFW in-water work window is shorter than six months long.	• ODFW recommends a biological assessment of the JCEP deepwater access and slips be completed following construction to determine the degree that production of shellfish/gamefish will recover and stabilize. ODFW recommends this recovery assessment be scaled based on productivity in undisturbed regions in the Bay (reference sites). • ODFW recommends this information be provided to ODFW, NRTAG (see above), local tribes, and other interested parties within one calendar year after construction of the slip and berth is completed and annually thereafter for a period of 10 years. • The direct impacts of initial construction are clearly identifiable. However, post-project indirect impacts are likely not. ODFW recommends appropriate monitoring/study plans for the project area and mitigation sites be developed by and formally agreed upon by the Applicant and pertinent stakeholders. • The expected hydrological changes at the site due to the project development will potentially result in a number of changes to the biological communities at those locations (e.g. densities, species composition, predatory interactions, etc.). • These changes may occur in areas adjacent to or a considerable distance from the project area where there is little or no construction activity (see Deepwater Zone recommendations below). • Long-term monitoring/study (i.e. majority of the FERC certificate duration) is appropriate to understand/mitigate for ecological and biological changes associated with the project. • Clarify whether or not extension of IN-WATER WORK WINDOW would be requested. Issue is similar to Port's Unified Dredging Permit extension request, which ended with DSL issuing extension despite ODFW's recommendation of dredging only within the recommended IN-WATER WORK WINDOW. • ODFW recommends costs for monitoring/studies and mitigation are borne by the Applicant.
Chapter 2.1.1	**Omissions:**	**Omissions:**

pgs 2-1-4; 2-9 to 2-16; Chapter 4.5.1	• ODFW should be identified as an "appropriate agency" with regard to consultation on the Wetland Mitigation Plan. • ODFW should be identified as an "appropriate agency" with regard to consultation on the Aquatic Species Nuisance Treatment Plan. The JCEP project needs to report to FERC any abnormal operating incidents that result in harassment or mortality of fish and wildlife species.	• Clarify ODFW's role/authorities for wetland habitat mitigation. Confirm ODFW is an "appropriate agency" with this regard. • Clarify ODFW's role/authorities for Aquatic Nuisance Species prevention/mitigation. Confirm ODFW is an "appropriate agency" with this regard. • ODFW recommends the DEIS add, "…mortality or sub-lethal injury to fish or wildlife species," as information that needs reported to ODFW.
Chapter 2.1.1.6; pgs 2-10-17	**Hydrological/Water Quality Changes:** ODFW points to three anticipated changes in the hydrology/water quality of the site that will impact fish and wildlife due to the JCEP/ PCGP Coos Bay development: A) Turbidity; B) Salinity intrusion; and C) Water temperature changes. **Turbidity:** Mobilization of substrates will occur during the initial dredging and with continued regular disturbance associated with maintenance dredging (estimated 115,000 CY every three yrs.; ~383,000 CY in the first 10yrs) within the project area. Turbidity will increase over an unknown portion of the Coos Bay during construction and when maintenance dredging is conducted. The 2019 DEIS relating to the Easement permit application indicates that dredging will occur on the regular three year interval.	**Hydrological/Water Quality Changes:** The 2019 DEIS has addressed ballast water temperature exchange suggesting pg 4-91 that ballast and bay waters will likely be similar. ODFW questions FERC's assumption. Further information is needed to determine if increased salinity intrusion has the potential to change the ecological conditions in Coos Bay to a notable degree. Turbidity can reduce primary and secondary productivity, while salinity intrusion can have a myriad of effects (e.g. change in species distribution, invasive species colonization ability, reproduction changes). ODFW recommends that all three factors A) Turbidity; B) Salinity intrusion; and C) Water temperature changes are monitored and addressed in the following ways: Predictive Hydrologic Model: ODFW recommends the Applicant(s) consultant(s) develop of a predictive hydrologic model to estimate how creation of the slip and maintenance dredging of the main Coos River channel will affect salinity intrusion into the bay *(ODFW recognizes the efforts of the Applicant that have been completed to date, however, these focus primarily on hydraulic flow rather than salinity patterns).* This model should be developed and distributed for review to the NRTAG and department prior to initiation of construction at the site.

	However, the slip and berth represent additional acreage that will be impacted over current levels and may require an increased dredging frequency. Additionally, the hydrodynamic modeling indicates the slip will become an alcove, likely collecting sediments at a greater rate than the main shipping channel. Increased turbidity levels in the open water column can result in suppression of primary production, affecting a number of ecological factors: • Survival and growth of estuarine plankton (Cloern 1987; Irwin and Claffey 1966). • Potential effects to feeding capability and subsequent reduction in planktivorous organisms (Carter et al. 2009; Horppila et al. 2004; Bash et al. 2001). • Survival and growth of species such as eelgrass are affected by factors that decrease total solar input and depth to which light penetrates into the water column. • Potential reduction in production of mollusks, Dungeness crab, juvenile coho, Chinook salmon and other species. • Comments received from DEA on 01/07/11 have been considered. **Salinity Intrusion:** The current 2019 DEIS does not note the *Oregon International Port of Coos Bay Section 204(f)/408 Channel Modification Project*, which ODFW	Inclusion of Hydrologic Factors in the Monitoring Plan: ODFW recommends the Applicant develop a monitoring plan (in combination with the biological monitoring plan as described above) in collaboration with ODFW/NRTAG to study/quantify/qualify: Turbidity effects; • Salinity intrusion effects; • Water temperature issues at the site. ODFW recommends this monitoring/study plan be developed in collaboration with the NRTAG/Department. Studies outlined in the plan should be completed for a time period necessary to meet the goals, which should be determined in collaboration with the NRTAG/department. Data Sonde Network: As part of the monitoring plan, ODFW recommends: • A network of data sondes be deployed to collect data on A) Turbidity; B) Salinities; C) Water temperature both at the surface and depth. • If salinity intrusion, thermal changes, or turbidity are determined to impact fish and wildlife resources, mitigation should be appropriately identified by the JCEP, department and NRTAG as consistent with OAR 635-415-0000 through 0025. ODFW recommends a monitoring/study plan be developed in collaboration with the NRTAG and department. This plan should include: • Biological information (e.g. abundance, species composition, behavior; for both native and invasive species) project in the bay. • Hydrological information (turbidity, salinity intrusion, water temperature changes) and specifically address ecological impacts related to the deepening of the JCEP site due to dredge activities. • Modeling that has been conducted by the Applicant to date has been informative. However, it may not accurately and precisely predict what actual post-construction hydrologic and ecological condition will be. The study should use an experimental design that includes before and After Controlled Impact

	suggests is linked to the JCEP project. The Applicant noted that hydrologic modeling has indicated sediments will likely accumulate at an accelerated rate in the berth area. To date, the Applicant has not modeled the potential that actions of the JCEP will increase the distance to which highly saline waters intrude due to the above noted Port project; into Coos Bay and the effects to residence time of highly saline waters. Increased salinity intrusion likely would affect Category 2 habitats in the JCEP area, but also in an unknown portion of the remainder of the bay. Effects may include: • Ecotone boundary changes altering aquatic plant growth patterns and distribution. • Distribution changes for plant and animal organisms vulnerable to salinity levels. • Changes to the available zones for reproductive success (e.g. Dungeness crab, striped bass Morone saxatilis). • Phytoplankton community productivity change related to nutrient regime shifts (i.e. the time of year freshwater dominates for a given reach of the Bay). Saline intrusion associated with increased dredging in the 1980's was thought to have had a notable negative impact on several fin fish species in the Bay including striped bass and American shad (*Alosa sapidissima*), although study results	techniques aimed at elucidating changes in shallow and deepwater communities, correlations between biological indices, and hydrological changes.

	were inconclusive. The impacts that this intrusion would have on native shellfish and finfish species such as fall Chinook, coho salmon, Dungeness crab, and native oysters cannot be modeled and would only be detectable through real-time monitoring. Salinity ecotones are known to highly affect the zones habitable for shellfish. Productive commercial oyster farms, which occur in euryhaline waters upstream of the project site, are currently protected from many fouling organisms and predators that occur in more stable salinities. Further intrusion of salt water will contribute to more stenohaline waters thus presenting new risk to a currently economically viable industry. Effects of the dredging may be detectable over the entire bay. Mitigation at the Kentuck site is not In-Kind when considering salinity intrusion. Ecological benefits at the Kentuck site would not be able to compensate for impacts that increased salinity could have throughout the Bay. Some understanding and determination of changes in salinity pattern (e.g. results from a salinity study), could guide adaptive management/mitigation.	

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	Water Temperature: Ships loading at the facility will discharge heated engine cooling water that may be as much as 3°C warmer than the surrounding water. Fish that come in direct contact with this plume will experience stress. ODFW recognizes that significant cooling of this water will occur soon after it is released from the vessel and sees this issue as less concerning, however, remains interested in potential for deleterious effects.	
Chapter 2.1.1.6; pgs 2-10-17	**Deepwater Zone Biological Communities:** Construction of the JCEP LNG slip and offloading site will create a new deepwater zone that is 25+ft in depth: This new deepwater zone will be constructed at 90˚ to the axis of the river channel forming a type of alcove morphologic feature that currently does not exist in Coos Bay. Deepwater zones that exist in Coos Bay tend to attract specific species compositions (e.g. white sturgeon, Dungeness crab, California halibut). However, these deepwater zones are in line with the main flow of the channel. Due to the location and hydrologic patterns associated with this new alcove, there needs to be monitoring to determine the species benefitted and or detrimental effects. The slip area will be highly disturbed during dredging and recover slowly, with re-disturbance at regular	**Deepwater Zone Biological Communities:** It is critically important to understand what impacts the development of a large "alcove" deepwater zone at the JCEP site will have on finfish and shellfish populations. Changes may occur to life-history patterns, movements, concentrations, overall abundance, and perhaps reproductive aspects of affected organisms in the Bay. Identifying these changes will be essential to development of a mitigation plan to compensate for negative impacts as they occur and are detected. ODFW recommends that specific studies be designed through coordination with ODFW and NRTAG to determine these changes or lack thereof. As described above long-term monitoring is critical to define the effects of this substantial proposed change to habitats in Coos Bay. ODFW recommends study of the effects of creating deepwater zones be conducted on an on-going basis through the majority of the JCEP/PCGP FERC license period. ODFW recommends this study attempt to document

	intervals associated with maintenance dredging. Installation of rip-rap and sheet-pile in the berth are expected to maximize the simplicity of the zone inhibiting the productive capacity for fish and wildlife. Consequently, there is concern with how construction of this site will affect life cycle patterns, population concentrations, overall abundance, and movements of certain affected species in Coos Bay. Specifically, e.g. will additional deepwater zone in this region of the bay affect the following: • Finfish/shellfish species densities in the JCEP area and other regions of the bay. If change occurs, how will this affect production of affected species in relation to current levels (e.g. predator-prey relationships with avian predation of salmonids, seal and sea lion predation to salmonids; avian predation to finfish)? • Competitive interactions associated with the habitat value or lack of value of the slip. Additionally, it is of concern if the slip will become a zone of higher density of predatory fishes. • Recreational opportunities related to current finfish/shellfish distributions (e.g. alteration of the distribution of Dungeness crab; salmon movement changes; influx of larger rockfish; etc.).	changes to populations including, but not limited to: change in species diversity, abundance, behavior, distribution, and species composition caused by the project. ODFW recommends Before and After Control Impact (BACI) study methods be used to provide before, after, and control structure for the investigations. ODFW recommends the Applicant receive guidance from ODFW/NRTAG for methods and timing (beginning, sampling frequency, and ending) for these studies. Study results should be distributed annually to ODFW/NRTAG, other interested agencies/parties. ODFW recommends a biological assessment of the JCEP deepwater access and slips be completed following construction to determine the degree that production of shellfish/finfish will recover and stabilize. This recovery assessment should be scaled on a percentage basis compared to productivity in undisturbed regions in the Bay. ODFW recommends reports be completed annually and information provided to ODFW, NRTAG, local tribes, and other interested parties within one calendar year after construction of the slip and berth is completed and annually thereafter for a period of 10 years. The DEIS needs to fully acknowledge the potential for use of the slip by juvenile salmonids and other fish or invertebrate species and monitor, and mitigate for use of terminal slip impacts to these species.
Chapter	**Recreational Users:**	**Recreational Users:**

4.13.1.3 Table 4.13-2; 4.14.1.6 pg 4-799, 80	It is ODFWs understanding that the U.S. Coast Guard typically requires exclusion zones of up to 500 meters surrounding LNG tankers transiting the bay and potentially while at dock for safety and national security purposes. The 2019 DEIS does not address this very serious potential impact to recreational and commercial boat and/or bank use of Jordan Cove and the surrounding bay areas. Any such actions by the US Coast Guard would likely result in a notable impact to public recreation for fishing, shellfish, or hunting which should be analyzed as part of the cumulative impacts of the project and fully mitigated for should they occur: The DEIS states that LNG ship traffic would not significantly impact recreational users because the # of vessels would equal the historic # of deep-draft ships that once called on Coos Bay. This does not take into account that: • Recreational use of the Bay has increased, with greater numbers of crabbers, clammers, and anglers participating. • The Bay area from the jetties to Jordan Cove is a high-use area for crabbing and salmon angling from boats. • It is uncertain whether or not USCG security/safety measures will require boats to completely leave the area, or simply require boats to clear the navigational channel to allow the ship to pass.	ODFW recommends FERC clarify safety/security requirements for recreational boaters when LNG ships are in transit within the K Buoy to terminal zone, specifically including any such future safety or national security exclusion zones likely to be implemented by the U.S. Coast Guard or any other state of federal enforcement agency. ODFW recommends that FERC and/or the applicant conduct a more thorough economic analysis of the shellfish (crabbing/clamming) and finfish (rockfish, salmon, steelhead) fisheries in Coos Bay, their contribution to the economics of Coos County and Southwest Oregon and address the potential impacts of the JCEP. The economic impact to these recreational opportunities and the local businesses that depend on them is directly related to this environmental concern. ODFW recommends FERC more carefully weigh the impact that any such loss of recreational access and fisheries revenue would have for local business and the State of Oregon's economy.
Chapter 4.5.2.2; pgs 4-	**Aquatic Resources:**	**Aquatic Resources:** Should use most up-to-date species status, which has

245-248; TABLE 4.11.3.1-1 (continued)	Omissions: • ODFW should be identified as an "appropriate agency" with regard to consultation on the Wetland Mitigation Plan. • ODFW should be identified as an "appropriate agency" with regard to consultation on the Aquatic Species Nuisance Treatment Plan.	changed for some species since 2005 report. ODFW Recommends: • Clarify ODFW's role/authorities for wetland habitat mitigation. Confirm ODFW is an "appropriate agency" with this regard. • Clarify ODFW's role/authorities for Aquatic Nuisance Species prevention/mitigation. Confirm ODFW is an "appropriate agency" with this regard. • ODFW recommends the JCEP project report to FERC any abnormal operating incidents that result in harassment or mortality of fish and wildlife species.
Chapter 2.4.1.5 pg 2-48	**In-Water Dredging/Work:** The DEIS outlines that dredging of the bay, placement of sheet pile, etc. will occur**.** At the JCEP project site there is some potential that Pacific smelt (eulachon) may be in this reach of the bay from January 15 until April annually. Although the presence of eulachon is considered highly unlikely.	**In-Water Dredging/Work:** The DEIS outlines the project's intent to complete work below the high tide zone. For work that will occur below the high tide watermark, ODFW recommends that these actions coincide with the In-Water Work window for the Coos Bay estuary (October 1 to February 15). At this particular site there is some potential that Pacific smelt (eulachon) may be in this reach of the bay from January 15 until April annually. Although the presence of eulachon is considered highly unlikely, as a precautionary measure ODFW recommends adjusting the normal In-Water Work window to October 1 to January 31. ODFW notes the 2019 DEIS reference to the in-water work window on pg 2-48.
Not located in 2019 DEIS	**Nest Site Searches:** The Applicant identified in the 2014 DEIS that nest site searches would be conducted prior to tree clearing to eliminate the risk that trees will be cut during nesting season, (although they will be harvested at a later date). ODFW was unable to locate language in the 2019 DEIS related to sensitive birds.	**Nest Site Searches:** ODFW recommends that the Applicant have qualified, trained staff complete surveys for Great Blue Heron Rookeries and Osprey nest sites prior to any timber harvest or pipeline construction at the appropriate time of year to complete surveys.
Chapter 4.3.3.1 pg 4-128; pg 210; Chapter 5.1.4 pg 5-4	**Exotic Plants and Wildlife:** Disturbed soils and removal of vegetation at the site combined with the installation of artificial tanks/pipeline/other structures will present opportunity for invasion of	**Exotic Plants and Wildlife:** ODFW recommends that the Applicant continue development and implantation of an upland invasive plant management plan in collaboration with ODFW and NRTAG to assist with concerns such as minimizing the potential for inadvertently benefiting exotic plants and wildlife. BMPs might include actions to

	non-native plants and are anticipated to result in further loss of habitat for native wildlife species (e.g. replacement of mourning doves *Zenaida macroura* with ring-necked doves *Streptopelia capicol*; native sparrows with house sparrows *Passer domesticus* and European starlings *Sturnus vulgaris*). There is also concern that corvid bird species (ravens, crows, jays) that are predators on snowy plover may benefit from the project. Often, exotic invasive species have a higher tolerance for direct association with humans; benefit from food wastes associated with daily human activities, and will potentially use perching and nesting opportunities that may become available due to this project, furthering displacement of native species.	minimize garbage and other human related factors which could lead to increased presence of exotic or otherwise undesirable predatory bird species such as starlings or corvids.

PCGP PIPELINE SPECIFIC COMMENTS:

Citation	Issue Identification	Recommended Resolution
Exec. Sum pg. 3; Chapter 4.2; pgs 4-72; 102; 268; 295; others	**Avoidance, Minimization, and Mitigation of Impacts to Habitat and Water Quality Associated with Stream Crossings:** Turbidity control measures for sediment generated at stream crossings, isolation of the work area, salvage of fish, Best Management Practices (BMP's) for equipment operation, measures for handling frac-outs if they occur, minimizing impacts to the riparian zone, and revegetation strategies are factors that need to be addressed for stream crossings. These have been partially, but not fully addressed by materials supplied by the applicant consultants, but not defined as a FERC permit requirement in the DEIS. It is known that ESA-listed fish specie(s) and or State Sensitive species will be present at the South Coos, North Fork Coquille, and East Fork Coquille river crossings include OC Coho salmon. State Sensitive-Vulnerable species include Coho salmon (coastal coho salmon SMU/Oregon Coast ESU). Winter steelhead (Oregon Coast ESU/coastal winter steelhead SMU) are considered Sensitive-Vulnerable in the Coquille River	**Avoidance, Minimization, and Mitigation of Impacts to Habitat and Water Quality Associated with Stream Crossings:** ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW and construct all fish bearing stream crossing actions within the periods identified in ODFWs standard In-Water Work timing guidance document unless otherwise approved in writing by ODFW. ODFW's standard In-Water Work timing guidance document can be viewed on our website at the flowing location: http://www.dfw.state.or.us/lands/inwater/ **Note:** ODFW advises it is not *biologically defensible to support any in-stream work during time periods when fish are actively spawning, migrating or when eggs or juveniles may be present in the gravels.* ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW and construct all stream crossing in a manner which avoids, minimizes and fully mitigates any residual impacts to fish and wildlife habitats consistent with the expectations identified in ODFW's Fish and Wildlife Habitat Mitigation Policy (OAR-635-415-0000 through 0025). The Department's Fish and Wildlife Habitat Mitigation Policy can be viewed on our website at the flowing location: http://www.dfw.state.or.us/OARs/415.pdf *Please see Oregon Fish and Wildlife Habitat Policy General Comment above.*

	basin, however, not in the Coos River basin. Pacific lamprey (*Entosphenus tridentata*) are considered Sensitive-Vulnerable in the Coos River, Coquille River, and Umpqua River basins making turbidity concerns heightened throughout in these watersheds, in addition to the concern within the Rogue River watershed. **Pipeline Crossing Across Coos Bay to East of Hwy 101** **Potential for Frac-Out with long distance HDD Drilling:** ODFW recognizes the JCEP/PCGP Applicant's efforts to reduce environmental impacts of the pipeline crossing to the east side of Coos Bay and foothills from the previously proposed "Open Cut" methods to HDD drilling methods. However, given the very long (> 8000 feet) HDD strategy, there remains a substantial potential for frac-out issues (defined here as the unintentional return of drilling fluids to the surface during HDD **Additional Concerns Specific to Subsurface Boring and Drilling Stream Crossing Methodologies:** ODFW's experience with other pipeline construction projects has shown that stream crossings and overland disturbance can be damaging to	ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW and acquire all needed state and Federal authorizations to salvage fish and/or aquatic wildlife which would otherwise be likely subject severe stress or mortality as a result in-water work, as appropriate at a site specific level . ODFW recommends salvage of fish and/or aquatic wildlife occur as appropriate and as feasible throughout the project locations. Detailed information on necessary state authorizations for fish and aquatic wildlife salvage, recommended protocols, and standard BMPs is available from ODFW upon request. • The JCEP/PCGP project needs to address turbidity control measures for sediment generated at stream crossings, isolation of the work area, salvage of fish, Best Management Practices (BMP's) for equipment operation, measures for handling frac-outs if they occur, minimizing impacts to the riparian zone, and revegetation strategies for all stream crossings containing native and migratory fish. • ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW and construct all fish bearing stream crossing actions within the periods identified in ODFW's standard In-Water Work timing guidance document unless otherwise approved in writing by ODFW. ODFW's standard In-Water Work timing guidance document can be viewed on our website at the following location: http://www.dfw.state.or.us/lands/inwater/. **Note:** ODFW advises this it is not *biologically defensible to support any in-stream work during time periods when fish are actively spawning, migrating or when eggs or juveniles may be present in the gravels.* ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW and acquire all needed state and Federal authorizations to salvage fish and/or aquatic wildlife which would otherwise be likely subject severe stress or mortality as a result

	watercourses if not carried out with extreme diligence. During construction of the Coos County Gas Pipeline horizontal directional drilling (HDD) was stated as being "clean and not impacting streambeds", however, "frac-outs" occurred and incurred environmental damage caused by drilling fluids leaking into fish-bearing streams. Drilling fluids can be water or oil-based and can include other additives. Although the bentonite base is claimed to be a benign ingredient, ODFW is unaware of what the other additives are and how harmful they can be to fish and aquatic wildlife. Between August and October of 2003 MasTec North America, Inc. was cited by DEQ for a series of water quality violations. The violations were a result of frac-outs during the horizontal drilling work for the construction of a natural gas pipeline under the North Fork of the Coquille River in Coos County. If similar frac-out related turbidity discharge impacts were to occur at the proposed Rogue River crossing, they would likely impact the significant spawning habitat for spring-run Chinook salmon in the Rogue River Basin. It is known that ESA-listed fish specie(s) and or State Sensitive	in-water work, as appropriate at a site specific level. • ODFW recommends salvage of fish and/or aquatic wildlife occur as appropriate and as feasible throughout the project locations. Detailed information on necessary state authorizations for fish and aquatic wildlife salvage, recommended protocols, and standard BMPs is available from ODFW upon request. ODFW recommends FERC require JCEP/PCGP develop frac-out containment and mitigation plans in coordination with the State of Oregon. ODFW recommends that emergency plans include immediate notification of any turbidity exceedance, frac-outs, and spills and pipeline leaks in Coos Bay. Sensitive marine environments can be severely impacted by these types of occurrences. However, impacts can be greatly minimized if ODFW biologists can quickly & accurately assess potential damages and recommend remediation actions. Should an incident like those described above occur, the project should contact Oregon Emergency Response System immediately (1-800-452-0311). In the case of leaks during pipeline operation or offloading or loading at the JCEP facility, ODFW recommends that emergency plans include surveys for fish and wildlife kills immediately following a release. **Additional Recommendations Specific to Subsurface Boring and Drilling Stream Crossing Methodologies:** Pipeline crossings using HDD or other subsurface methodologies can be expected to cause frac-outs in Coos County geology and possibly throughout the project. The Applicant should be prepared for construction stoppages, cleanup, and remediation of damages caused by frac-outs. For that reason,

	species will be present at the South Coos, North Fork Coquille, and East Fork Coquille river crossings include OC Coho salmon. State Sensitive-Vulnerable species include Coho salmon (coastal coho salmon SMU/Oregon Coast ESU). Winter steelhead (Oregon Coast ESU/coastal winter steelhead SMU) are considered Sensitive-Vulnerable in the Coquille River basin, however, not in the Coos River basin. Pacific lamprey (*Entosphenus tridentata*) are considered Sensitive-Vulnerable in the Coos River, Coquille River, and Umpqua River basins making turbidity concerns heightened throughout in these watersheds, in addition to the concern within the Rouge River watershed. **Non-fish Bearing Stream Crossings and Other Storm Water Drainage Conveyance Structures:** Although non-fish bearing stream crossings and stormwater conveyance infrastructure are not subject to the same design criteria identified above for fish bearing stream, ODFW remains concern with regard to sizing and instillation of these types of infrastructure. Culverts or other crossing infrastructure should be sized in excess of hydraulic capacity need to help facilitate wildlife connectivity between habitats and minimize potential downstream water	crossings construction timing should occur during ODFW's recommended in-water timing guidance or as otherwise approved by ODFW in writing. HDD and other subsurface boring or drilling crossing design locations should pro-actively address the risks associated with the potential for a "frac-out" or inadvertent loss of drilling fluid to the extent practicable: ODFW recommends FERC condition the project certificate such that the Applicant is required to complete consultation with ODFW including submittal of any risk assessment and geotechnical documentation for any stream crossing which are proposed as subsurface boring or drilling stream crossing actions. Submittals should also include descriptions of alternate or contingency crossing methods should the primary method result in an inadvertent loss of drilling fluid, otherwise known as a "frac-out" or otherwise fail as a successful crossing action. ODFW further recommends FERC condition the project certificate such that the Applicant is required to: • Conduct adequate geotechnical analysis to ensure frac-outs will not occur (e.g. identify vulnerable geologic issues, adjust the depth of drilling, etc.). • Provide a list of the additives used in drilling fluids and their potential effects on the aquatic environment. • Implement specific drilling BMPs to ensure constant monitoring of drilling fluid return volume so that drilling can cease immediately if drilling fluid is not returning at the expected/standard volume for a successful HDD attempt. • Identify measures that will be taken to minimize impacts of a frac-out if a frac-out occurs and mitigation that will be implemented if a frac-out occurs as cleanup is not feasible and attempts will

	quality impacts such as turbidity sedimentation transport resulting from scour at undersize infrastructure.	create additional damage. Mitigation could include: Placement of LWD; placement of clean washed spawning gravel; road drainage improvements (cross drains, improved surfacing); road decommissioning. • Establish performance bonds and/or require performance bonds of drilling subcontractor to ensure adequate funding is immediately available to address/mitigate a frac-out or other drilling failure which results in damage to fish, wildlife, or the habitats they depend on. <u>HDD Actions in the Lost River Drainage.</u> The Klamath Fish District of ODFW requests that drilling any HDD activities are implemented between July 1, and October 31, or as soon as water conditions are deemed uninhabitable by fish due to poor water quality. Shortnose suckers (*Chasmistes brevirostris*), Lost River sucker (*Deltistes luxatus*) and redband trout (*Oncorhynchus mykiss*) inhabit this stretch of river from November to July; poor water quality triggers migration to upstream refuge habitats. Fish are highly sensitive to sound waves that could be caused by drilling disturbances and sound waves could act as a migration barrier. **Non-fish Bearing Stream Crossings and Other Storm Water Drainage Conveyance Structures:** ODFW recommends that all streams be considered fish bearing unless documented to be absent of fish. If a stream crossing or storm water conveyance structure is determined to be non-fish bearing, ODFW still recommends the work be completed: • ODFW's standard In-Water Work timing guidance document or if the stream or storm water conveyance structure is dry. (see reference above). • The Applicant consider oversizing the infrastructure and installing it in such a manner to maximize its performance as a suitable wildlife crossing structure and to minimize potential for

		downstream water quality impacts such as turbidity sedimentation transport resulting from scour at undersize infrastructure.
Chapter 1.5.2.5 pgs. 1-31,32 Chapter 2.1.5 pg 2-34,35; Chapter 4, pgs 4-268-289. Appendix I Table I-2 pgs I-2-1 to I-2-47	**Site Specific River/Stream Crossing Concerns:** <u>Lost River Crossing-</u> See above specific timing recommendation <u>Rogue River Stream Crossing-</u> Pacific Connector states that if HDD of the Rogue River is unsuccessful Direct Pipe (DP) methods would be a potential option. Previously wet, open-cut crossing were also proposed. ODFW **does not** consider a wet, open-cut to be an acceptable contingency method. <u>South Umpqua Direct Pipe Technique Site #1 at MP 71.27), and South Umpqua Open Cut Site #2 at MP</u> <u>94.73; see Tables 2 and 3 -</u> This proposed crossing occurs at an ecologically important site. A gravel bar is located approximately 300 m downstream. The gravel bar at this site provides river complexity, high flow refugia and summer slow water habitats which are considered to provide both essential and limited habitat function for a variety ESA-listed	**Site Specific River/Stream Crossing Concerns**: ODFW encourages both the Applicant and FERC to acknowledge the potential for severe impacts to fish, aquatic wildlife, and the habitats they depend on by ensuring the above recommendations become conditions of any Federal Authorizations or permits for the PCGP project. ODFW recommends site specific coordination and consultation between the Applicant and Department staff to fully identify unique site specific resource concerns at these crossing locations. ODFW anticipates that significant resource impact avoidance and minimization can be realized through collaboration with local Department staff throughout the crossing design, construction, and restoration/mitigation recovery phases at these river crossing locations. **Fate Creek:** ODFW recommends the Applicant engage Department staff for assistance identifying appropriate mitigation needs at this site.

	fish, state-sensitive listed fish and aquatic wildlife. **Fate Creek:** The DEIS does not provide a site specific plan for Fate Creek. The resource plans do not address or mitigate for all impacts associated with stream crossings under ODFW's Fish and Wildlife Habitat Mitigation Policy.	
Chapter. 2.7.2 pg 2-71; pg 2-171 Chapter 4.4.3.4, pg. 4-176; pg 4-210;	**Aquatic Habitat Impact/Mitigation Concerns:** **Points of Diversion Fish Screening:** The Applicant has identified Points of Diversion (POD's) that are within 150 feet of the work area. Many POD's have water conveyance ditches outfitted with fish screens. Not all fish screens are located in the immediate vicinity of the POD. **Herbicide Use Near Streams/Wetlands:** The Applicant states that pesticides or herbicides will not be used in or within 100 feet of wetlands unless allowed by the land management or permitting agency. **Small Stream Temperature Issues:** The DEIS states in pg 4-503; that temperature increases	**Aquatic Habitat Impact/Mitigation Concerns:** **Points of Diversion Fish Screening:** ODFW recommends that the PCGP project precisely identify the location of fish screening equipment as it relates to the work area. **Herbicide Use Near Streams/Wetlands:** ODFW recommends against general use of herbicides and pesticides in wetlands. ODFW recommends any use be judicious and meet federal, state, and local, regulatory requirements. **Small Stream Temperature Issues:** ODFW recommends FERC condition the certificate to direct the Applicant to treat all intermittent waterbodies within the Coast, Umpqua, and Rogue basins the same as perennial streams and provide these streams the same level of protection, as stated in the DEIS, comparable streams on Federally managed lands. **Large Woody Debris (LWD) as Mitigation** (See Appendix A below)**:** ODFW recommends a stream habitat mitigation plan be developed for every fifth field watershed crossed in order to effectively

	on streams will be minor. However, Rogue summer steelheads primarily rely upon streams with low or intermittent flow for spawning and brief periods of rearing. Numerous intermittent streams within the Coastal Range are also important for Coho production. **Large Woody Debris (LWD) as Mitigation:** ODFW, recommends revisiting analysis and discussion of LWD as mitigation as in many cases placement of a small number of pieces of LWD do not address impacts (sediment, disturbance of channel morphology, long-term canopy removal etc.). LWD treatments as mitigation are not considered "In Kind" for impacts to riparian canopy. ODFW believes this approach, without further augmentation, would likely fall short of compensating for loss of habitat functions and values from anticipated project impacts. LWD placed haphazardly and not within a continuous project typically do not provide immediate or long term benefits for adult or juvenile salmonids. Forested riparian areas	mitigate for the life-long impacts of the project. In addition the Applicant should fully mitigate for the multiple impacts at stream crossing sites including, but not limited to: • Access roads and associated sediment production to streams. • Loss of riparian canopy that increases solar input. • Elimination of much of the filtering capacity of the RMA due to removal most other lost habitat values/benefits of riparian habitat as well. • Destabilization of stream channels and streambanks. ODFW recommends that in addition to placement of LWD at stream crossing sites the following restoration and mitigation actions may greatly complement the functional habitat benefits provide by LWD placement : • Placement of forest vegetation (limbs, small woody debris, etc.) scattered on bare soils following disturbance within 50ft. of each pipeline approach to streams. This material will be readily available due to land clearing efforts • Purchase of riparian easements on private timber or agricultural lands in the HUC 6 watershed. Appendix A below contains a number of potential mitigation options. • Placement of washed spawning gravel at all stream crossing impact sites in the Coastal Zone and considered on a site by site basis for all other stream locations. Spawning gravel is often a limited quantity habitat feature in the Coastal Zone and placement will augment productive capacity of reach impacted for salmonids. • Gravels should consist of washed drain rock from an upland source (such as the Elk River Pit in Langlois, OR • Gravels should consist of 1.5 inch diameter washed drain rock for Coho and steelhead spawning streams; 0.75 inch washed drain rock for streams where only cutthroat trout are present. • Gravels should be applied at the rate of 8.0 inch depth over the reach impacted to the width of the ACW and up the banks 2.0 feet (which will reduce bank instability). Thus if a 40 foot reach of stream

	contribute more than LWD (e.g. shade, nutrients, predatory cover, wildlife habitat, etc.) to streams.	channel is disturbed and the ACW is 8 feet wide, then the quantity needed would be 40.0 feet x (8.0 feet ACW+ (2x2 banks)) x 0.67 ft. (8.0 inches) or a total of 321 cubic feet or roughly 12.0 cubic yard (CY).
Chapter 4.6, pgs. 4-270-291; Appendix C 36pgs; Appendix H 36pgs;	**Water quality Impacts from Sedimentation, Storm water Runoff, and Roads:** **Sedimentation Impacts from Clearing and Grubbing Large sections of ROW:** This section lists actions designed to reduce run off and catch sediment. One thing missing is a discussion identifying how much area will be cleared and grubbed at one time. Lessons learned from the ODOT's Pioneer to Eddyville project (in the Coast Range Mountains) include the need to limit the amount of ground cleared of vegetation at any one time. The pipeline will cross 71 miles of the Coast Range, so special care should be taken to limit erosion and sediment loss in this section as well as any other areas of significant rainfall with steep slopes. The timing of the pipeline construction should allow for ground clearing to occur after the spring rainy season and any areas opened up should be seeded and vegetation established before the fall rains. Distance and slope can be taken into account regarding the amount of land cleared and	**Water quality Impacts from Sedimentation, Storm water Runoff, and Roads:** **Sedimentation Impacts from Clearing and Grubbing Large sections of ROW:** Given the known instability and potential precipitation levels in the Coast Range Mountains ODFW recommends: ODFW recommends that the Applicant develop a detailed written plan that identifies the maximum amount of land cleared and grubbed at one time. The plan should also identify (1) areas of high, medium, and low levels of risk for sediment escape and impacts to water bodies. Based on slope and proximity to water bodies, and (2) include a re-vegetation section that ensures re-establishment of vegetation in high and medium risk areas prior to the fall rains. **Pipeline Steep Slope Concerns and Roads:** Pipeline Steep Slope Concerns: Stabilization/erosion control of upland slopes following pipeline construction will be nearly as important as stabilization/erosion control in riparian areas adjacent to streams. Some extremely steep slopes will be encountered in the Coos County portion of the pipeline. ODFW recommends the following for locations where the pipeline will traverse or the route will be placed on slopes which qualify as High Landslide Hazard Locations (HLHL as defined in ***Oregon Dept. of Forestry Technical note 2.0 vers 2.0; (ODF Jan 1, 2003)***; in Tyee Sandstone over 65% slope on headwall locations and 75% ridges): • ODFW recommends the pipeline construction route incorporate cross slope trenching as

	grubbed, i.e. the greater the distance from a creek and the flatter slope, the less concern for down slope sediment escape and erosion that can ultimately impact water bodies. The DEIS recognizes the geological instability of the Coast Range in the following sections: Chapter 4.1; pg 4-6 , under Landforms and Erosional Coast Range paragraph 1: *"The wet conditions of the western slopes of the Coast Range, along with steep terrain composed of relatively weak rock, contribute to an active erosional environment with frequent landslides."* The Coast Range receives some of the highest precipitation totals in the continental U.S., with some areas receiving up to 200 inches per year." **Pipeline Steep Slope Concerns and Roads:** A number of miles of the pipeline will be constructed on slopes that exceed 50%. Tyee sandstone geology in the Coos and Coquille River basins and the geology of the Rogue Basin to a lesser degree are highly prone to landslides if the supporting matrix is disturbed. Additionally numerous access roads will be built to harvest timber and access construction	opposed to routing parallel to the slope whenever possible to reduce the risk of soils moving laterally in the trench downslope (mass wasting slides). • Placement of erosion control matting has been outlined as an upland soil disturbance control measure. This, in combination with cross slope placed large wood, stumps, and other wood material, is considered a modestly reasonable attempt for erosion control. ODFW recognizes that pipeline corridor management strategies are not likely to allow for placement of large wood in pipeline corridors. • ODFW recommends rock or other structures be placed across the pipeline trench at a 90˚ angle and be embedded in the undisturbed walls of the trench a minimum of 4ft. to prevent free movement of soil in the disturbed pipeline trench. These structures should be placed at 100ft. intervals. • Steep slope pipeline locations should receive additional efforts with seeding and mulching. Additionally these segments of the pipeline route should have cross slope structures and drainage networks to reduce failure risk. ODFW recommends the road network: • Have surfacing that is sufficient to accommodate travel loading and prevent erosion of the road surface through all months. • Have cross drains installed at a density/spacing that is equivalent or exceeds to recommendations in the ODF Forest Practices Technical Note Number 8 vers.1 (ODF Jan 2003). • Have mitigation for sedimentation/mass wasting issues clearly identified in-proximity regardless of ownership (federal or non-federal) as these locations have the greatest potential for measurable improvements in reducing sediment loading to streams impacted.

	of the PCGP. Essentially the pipeline route is a 229 mile road through the landscape. Mass wasting debris torrents and general erosion are considered substantial threat to ESA listed and non-ESA listed salmonids as well as amphibians. Extensive research has documented the impacts of sediments to salmonids. Work to reduce sediment input into coastal and inland streams that will be impacted by the pipeline is foundationally critical for enhancing spawning and rearing habitat for fall Chinook salmon, Oregon Coast (OC) threatened Coho salmon, Pacific lamprey (*Entosphenus tridentata*), winter steelhead (*O. mykiss irrideus)* and coastal cutthroat trout (*O. clarki clarki)* as water quality is directly linked to hatch rates and food available for these species. Sediment loading above natural background levels contributes to embedding of substrates which often results in reduced hatch rates for eggs in redds, inability of fry to emerge from redds, inhibited production of macroinvertebrates (invertebrates largely live in the interstitial spaces of gravels), and impacts on the ability of fish to obtain food due to the nature of salmonids to feed predominantly by using their sight (Burns 1970; Hall and Lanz 1969; Weiser and Wright 1988; Suttle et al. 2004; Tripp and Poulin 1992; Waters 1995). See Appendix A Figure 1-3.	**Emergency Response Notification Water Quality:** ODFW recommends that emergency plans include immediate notification of: • Turbidity exceedances, frac-outs, and spills and pipeline leaks for both the JCEP facility and PCGP. • ODFW recommends that emergency plans include surveys for fish and wildlife kills immediately following a frac-out, spill, or gas release. Should an incident like those described above occur, the project must contact Oregon Emergency Response System immediately (1-800-452-0311) in the case of leaks during pipeline operation or offloading or loading at the JCEP facility or along the PCGP route. **Natural Gas Pipeline Shut-Off Valves-LNG Control at Large Rivers:** ODFW recommends that options to have shut-off valves on each side of large stream crossings such as the South Umpqua, Rogue, and Klamath Rivers be evaluated.

	Emergency Response: Emergency plans, including immediate notification of turbidity exceedances, frac-outs, spills, and pipeline leaks for both the JCEP facility and PCGP, are considered critically important. Sensitive fish and wildlife habitats can be severely impacted by these types of occurrences. However, impacts can be greatly minimized if remediation actions are initiated quickly upon discovery of an incident. **Natural Gas Pipeline Shut-Off Valves:** ODFW remains concerned with potential impacts to fish, wildlife, and their habitats from unanticipated failures or gas releases: Is it possible to have a shut-off valve on each side of large stream crossings, such as the South Umpqua, Rogue and Klamath Rivers? If there is a rupture and a natural gas release, how long will it take for the spilling to cease? How far apart are the proposed shut-offs?	

		Natural Gas Pipeline Shut-Off Valves Controlling Transmission Pipeline Failures: ODFW remains concerned with potential impacts to fish, wildlife, and their habitats from unanticipated failures or gas releases. Therefore, ODFW recommends frequent and strategically located shut-off valves, to the extent practicable, in order to minimize the location of and extent potential impacts to fish, wildlife, and the habitats they depend on should failures or gas releases occur during construction or over the life the project. An Operations and Maintenance (O&M) plan should be developed with contingencies identified for any need repair, maintenance, or in case of a failure in and around sensitive aquatic habitats such as waterway crossings.
Chapter 2.0 Chapter 4-298-301; Appendix M 302 pgs	**Hydrostatic Testing:** The DEIS describes use of 64 million gallons of water to complete hydrostatic testing. Removal of 11,193,575 gallons from the South Umpqua fourth field HUC, including an estimated 4,562,407 gallons from the South Umpqua alone will possibly be a substantial impact on fish and wildlife resources, especially during periods of low flow and poor water quality. Transport of invasive species is a substantial concern with transport of water from a source basin and release at another point in an adjacent watershed. Damage and control costs of invasive species in the United States are estimated to be more than	**Hydrostatic Testing:** ODFW recommends: • ODFW notes changes to the Hydrostatic Testing Plan that assist with guiding erosion potential and encourages continued efforts to alleviate this impact to reduce erosion impacts due to pipeline testing discharge. • In addition, the project proponents need to continue to incorporate methods to eliminate the possibility of spreading invasive species (such as New Zealand mud snails, smallmouth bass fry) especially given that the pipeline may convey water between non-hydraulically connected basins and in some instances, be “cascaded” across the landscape to be used for the next segment. Minimizing the risk, as discussed in the plan, is not adequate. Water diverted will need to be tested along with water at the nearest discharge waterbody to see if stream pathologies are similar or measures taken to ensure water released is sterilized. • NMFS-approved screening on diversions is required and fish passage at these locations must be maintained. • In addition, test water should not be allowed to drain into waters of the State and chlorinated

	$138 billion annually and 80% of endangered species are deleteriously impacted by these species through predation or competition (Pimental et. al). Impacts from invasive fish species alone cost $6.03 billion annually (Cusack et. al.). If testing occurs in the fall this is a period of adult anadromous migration including fall Chinook, coho, and winter steelhead. Also, this can be the period of lowest stream flow, and water for hydrostatic testing water may be unavailable unless purchased from existing available water sources such as reservoirs. Inter-basin mixing of water could adversely affect migration of adult anadromous fish (salmon, steelhead and lamprey) to their natal streams through a phenomenon known as false attraction. Supplying water from an Oregon Department of Environmental Equality 303(d) TMDL Water Quality limited waterbody to a basin of higher water quality may result in reduced water quality in the source watershed. Hydrostatic testing will require additional staff to survey for the Northern Spotted owl due to noise disturbance on the pipeline route. It is uncertain	water should not be used for the testing unless the release location will not enter a stream, wetland, or waterway. • ODFW recommends continued efforts to develop the Hydrostatic Testing Plan as well as a Hydrostatic Monitoring protocol with the intent of approval of the plan by ODFW, other state and federal agencies. The survey will monitor ramping, fish stranding, and water temperature at pumping and release sites, salvage fish, and document fish losses. The project proponents should conduct the surveys with competent biological staff. • A summary report of monitoring would be submitted to the agencies, along with compensation for losses to fish and wildlife resources.

	and not addressed in the DEIS as to if this will have additional impacts on nesting Northern Spotted Owls.	
DEIS Section 4.1, 4.3, 5.3, and Condition #25; Also Appendix F-10 Part 4 Hydrostatic Testing	**Water Quantity and Quality related to Hydrostatic Testing:** Groundwater impacts: Section 4.3, Page 4-81 discussion of construction impacts does not acknowledge impacts to local landowners or impacts to fish and wildlife. **Instream Flow:** Section 4.3, Page 4-109 does not discuss whether and how the use of this water for hydrostatic testing represents a change in character of use, which would trigger a WRD Water Rights Transfer per ORS 540.505 to 540.580 and OAR 690 Divisions 380 and 382. **Hydrostatic test water treatment:** Section 4.3, Page 4-109 the DEIS discusses treatment of the discharge water with a 'mild chlorine treatment', however the temporary impacts to water quality are not evaluated. **Instream Water Rights at Hydrostatic Source Locations:** Table 4.3.2.2-7, Page 4-110 outlines the potential water sources for hydrostatic testing	**Water Quantity and Quality related to Hydrostatic Testing:** Groundwater impacts: Section 4.3, Page 4-81 ODFW recommends this section more fully address how the pipeline could impact groundwater supplies, springs, seeps, and wells. **Instream Flow:** ODFW recommends the DEIS more fully address whether the hydrostatic uses will require water rights transfers and what that will mean for impacts to fish and wildlife and to other local uses. **Hydrostatic test water treatment:** ODFW recommends the DEIS more fully describe the chlorine application rates and potential impacts to water quality even with the minimization measures described therein.

	but does not identify potential impacts to existing instream water rights. **Cross-Basin Discharge**: Section 4.3, Page 4-111 discusses the plan for cascading test water across watershed basins. While the DEIS discusses how it will minimize introduction of pathogens across basins it does not address the impacts of overall decreased water quantity within the source basin. **Water Availability for Intake:** Section 4.3, Page 4-111 also Page 4-98 (mention of Coos River, East and Middle Fork Coquille Rivers, Olalla Creek, South Umpqua Riger, Rogue River, Lost River, and Klamath River) discusses the potential effects on downstream flow associated with hydrostatic testing. The DEIS estimates reduction of less than 10% of typical monthly flow. However the DEIS does not acknowledge that in some years there may not be water available even for a Limited License. In low-water years, existing instream water rights might not be met already during the "dry season" so further withdrawal could cause additional harm. **Point of Diversion Effects**: Section 4.3, Page 4-118 the DEIS	**Instream Water Rights at Hydrostatic Source Locations:** ODFW recommends FERC include a condition for PCGP to check for Instream Water Rights at all hydrostatic sources, and evaluate the timing of water use when water is available. **Cross-Basin Discharge**: ODFW recommends FERC evaluate the impacts of an overall decrease in water quantity within source basins that may result from hydrostatic testing. If water quantity may decrease in source basins, ODFW also recommends FERC include a condition for the applicant to consult with ODFW and WRD to mitigate for this lost water quantity. **Water Availability for Intake:** ODFW recommends FERC evaluate low-water years when instream water may not even be available for hydrostatic testing, even with a Limited License. The DEIS should examine what alternate strategies might be used in these situations, and also how these additive impacts to fish and wildlife will be minimized or offset. The DEIS should also mention decreased flow as a potential impact to fish in Section 4.6.1.3.

	states "*Pacific Connector would consult with the landowner if impacts on a water supply's point of diversion cannot be avoided, and prior to construction would work together to identify an alternate location to establish the diversion*". Moving a point of diversion has the risk of causing injury to instream water rights. Moving a point of diversion requires a WRD water right transfer application, which can take significantly more time to review than a limited license application. A water right transfer can also require fish and wildlife habitat mitigation, if the transfer may cause permanent impacts to the instream flows. See ORS 540.530. **Cumulative Impacts to Water Quantity**: Section 4.1.4.1.2 does not consider the cumulative impacts to water quantity, which may result from hydrostatic testing, dust abatement, and other water uses. **Dust Abatement**: Section 5.3 bottom of page 5-3. The DEIS concludes that 75,000 gallons per day of water for dust control would not result in significant impacts on surface water resources. However, ODFW contends that further withdrawal from the streams and rivers named in the DEIS	**Point of Diversion Effects**: FERC and the PCGP should be aware of the State of Oregon's statutes regarding Point of Water Diversion (ORS 540.530) and build in adequate time for the process.

	may have an adverse impact to fish and wildlife due to reduced flow. Instream water rights are already not met much of the year in these areas. **Instantaneous Flow Reduction**: Condition #25 on Page 5-18. This condition requires PCGP to file a Hydrostatic Test Plan allowing water withdrawal not to exceed an instantaneous flow reduction of more than 10% stream flow. This condition is problematic because existing instream rights are often not met much of the year on small streams. Ten percent on a small stream in summer may have a large impact on instream flow. This metric of 10% is not consistent with state water allocation based on water availability.	**Cumulative Impacts to Water Quantity**: ODFW recommends cumulative impacts to water quantity be addressed in the DEIS. **Dust Abatement**: ODFW recommends the DEIS reanalyze its determination for the impacts to fish and wildlife associated with dust abatement water withdrawals.

		Instantaneous Flow Reduction: ODFW recommends PCGP coordinate with WRD and ODFW to establish the appropriate metric for downstream flows in the Hydrostatic Test Plan, and that Condition #25 in the DEIS be amended to reflect this coordination.
Chapter 4.3 pgs 4-131-134; Appendix H 37pgs	**Wetland Habitat Impact/Mitigation Concerns:** The project is anticipated to produce substantial turbidity to wetlands adjacent to the pipeline Right of Way and road networks associated with the project. Additionally, noise from hydrostatic testing will likely impact amphibian populations, potentially disrupting breeding cycles. Table 4.3.3.2-1 Summary of Wetland Impacts by notes 112.2 affected wetland acres 0.91 acres of permanent impacts within the pipeline route. Major wetland functions include water storage, carbon sequestration, slow water release, maintenance of high water tables, temperature regulation, nutrient cycling, sediment retention, accumulation of organic matter, filtration, and maintenance of plant (by provision of substrate for plant colonization) and animal communities. Measures need to be taken to eliminate the risk of spreading invasive	**Amphibian Direct Mortality and Long-Term Passage:** ODFW recommends the Applicant meet with a Department biologist to discuss the need for amphibian salvage depending on the specific proposals for construction through or near waterways and wetlands. ODFW recommends surveys are completed for both amphibians and reptiles. Additionally: • ODFW recommends that final constructed designs provide for amphibian passage along the pipeline route (i.e. installing cross drains under access roads that connect wetlands). Installation of culverts with stream simulation design is considered to fully provide for amphibian passage. There will be a number of locations where fish are not present that passage for amphibians may need to be provided on a case by case basis. • ODFW recommends the PCGP project staff consult for all wetland locations >0.1 acre in size with Department staff at least 1.0 months prior to disturbance to determine methodologies to reduce impacts to amphibians and identify if salvage is necessary.

	plants and noxious weeds. The monitoring needs to contain specific goal criteria and contain contingency plans if restoration attempts are not successful. **Big Butte Creek Fifth Field HUC:** The DEIS notes that an extremely long wetland crossing 1,680 feet (0.31 mile) and 4.21 acres of wetland impact is proposed in this watershed **Amphibian Direct Mortality and Long-Term Passage:** The PCGP project is anticipated to incur notable mortality to amphibians resulting from proposed construction methods in riparian areas, stream adjacent wetlands, and perched wetlands. Amphibians range in mobility from highly mobile to extremely limited. Installation of crossings where there is currently stream/wetland connectivity can result in increased predation and reduced capacity of amphibians to access needed habitats. This is critical where wetland are ephemeral. The DEIS does not outline that reptile surveys will be	

	conducted.	
Chapter 1.0, pgs 1-31, 32; 2-56, 61, 69; Chapter 3.0 pgs 3-20-23 Chapter 4.2.3.1 pgs 4-72 Appendix H 37p	**Amphibian Salvage Expectations:** **ODFW's Scientific Take Permits:** Scientific take permits are relevant to coordinate salvage and movement of fish and wildlife species impacted during a project. **Amphibian Salvage:** The JCEP staff proposed that in order to mitigate potential impacts on amphibians and reptiles it would conduct pre-construction surveys for the northern Pacific pond turtle, northern red-legged frog, and clouded salamander. Individuals located within the construction area would be captured and transported to suitable nearby habitats, agreed to with the ODFW.	**Amphibian Salvage Expectations:** **ODFW's Scientific Take Permits:** ODFW recommends a condition be included for the Applicant to apply for and comply with state scientific taking permits. • ODFW recommends that the pipeline staff report quantified known injuries and mortalities by species during construction of the project. • ODFW recommends that the PCGP staff report injuries and mortalities of fish and wildlife by species associated with operation of the pipeline or in an emergent condition. **Amphibian Salvage:** ODFW recommends FERC condition the project certificate such that the Applicant is required to acquire all needed state and Federal authorizations to salvage amphibians which would otherwise be likely subject severe stress or mortality as a result in-water work or wetlands impacts, as appropriate at a site specific level . ODFW recommends salvage of amphibians occurs as appropriate and as feasible throughout the project locations. Detailed information on necessary state authorizations for fish and aquatic wildlife salvage, recommended protocols, and standard BMPs are available from ODFW upon request. ODFW also recommends increasing the number of wildlife ramps to avoid reptile and amphibian entrapment in the pipeline trench (Section 4.5).
Chapter 4.5 pgs 289-291; Table 4.5.2.3-5	**Riparian Habitat Impact/Mitigation Concerns:** Riparian vegetation within the Riparian Management Area (RMA) zone near streams, wetlands, and waterways is	**Riparian Habitat Impact/Mitigation Concerns:** (See Appendix A below): ODFW recommends that riparian vegetation buffers that: RMA vegetation meet or exceed State and local

	critically important for the health of Oregon's native fish populations, especially in the drier parts of the pipeline corridor such as the Rogue and Klamath watersheds. Native fish in the state are predominantly cold water species that evolved in stream conditions that were in most cases facilitated by climax or second growth hardwood and conifer forest, thus near maximum shade that the stand would produce. The Oregon Dept. of Environmental Quality has identified 303d temperature listed streams including numerous streams through the pipeline route. These listings relate directly to removal of riparian vegetation since the 1800's. ODFW notes that PCGP staff have developed a water temperature model to evaluate the impacts of the project at specific stream crossings. Table 4.3.2.2-9 identifies through modeling efforts that some streams impacted by the PCGP will be cooler following removal of the riparian corridor. The results of this model seem counterintuitive to the principle of riparian width and size having a direct positive correlation with shading and cooler micro-climates to help	government requirements be implemented on non-federal lands. All disturbed areas need to be replanted with native vegetation. ODFW recognizes that the proposed crossing locations may be on lands where private landowners may not allow the full setback to be replanted. In these situations, ODFW does not object if mitigation for permanent riparian impacts occurs off-site provided that it occurs within proximity within the same HUC 6 watershed and on private lands. <u>Thinning as Mitigation:</u> ODFW recommends this treatment is unlikely to produce results that benefit fish and their habitats as the results are distant in the future due to the long period for trees to grow and mature. Accordingly this action should not be assumed to provide fish/stream benefits and should be used only on a very limited basis with clearly defined objectives that address location specific limiting factors.

	keep stream temperatures cold. In addition BLM modeling in 2013 showed notable temperature increase potential for very small streams of 1˚-5˚F. (Additional information about the scientific merit of different types of Riparian treatment is explored in Appendix B of these comments and recommendations below.	
DEIS ES pgs 1-6; Chapter 2.1.2-2.7.2 Chapter 4.6	**Upland Impact/Mitigation Concerns:** ODFW has previously provided feedback to the Applicant: • Regarding snag creation, and elk habitat/forage. Previous feedback for creating forage areas for deer and elk using ODFW's recommended forage seeding mixture has not been addressed. • ODFW's recommended snag retention concept has been addressed, but the species of conifers, minimum diameter at breast height (dbh) used, and number per acre or linear foot were not estimated. • ODFW's recommended down wood concept has been addressed, but the species of trees, minimum dbh used, linear feet per acre, and number per acre were not estimated. • ODFW's recommended legacy tree concept was not addressed at all including the species of trees, minimum	**Upland Impacts/Mitigation Concerns:** (See Appendix A below): ODFW recommends further discussion of upland mitigation proposals, including: • Mitigation in the form of incorporating specific snag densities, down wood, danger tree replacement, and legacy trees. Many of these rare upland habitat types may provide essential habitat function for critical life stages of fish and wildlife. If habitats or habitat function are mis-categorized and/or critical habitat functions are not adequately compensated for, the proposed mitigation sites may fail to meet or exceed ODFW's specific mitigation recommendations. • ODFW recommends further discussions regarding elk and deer forage plantings within the pipeline corridor with the recommendation that production wildlife forage be considered a goal of the final vegetative community in the pipeline corridor.

	dbh used, and number per acre were not estimated.	
Chapter 4.14.13; Appendix I, 174pgs	**Forest and Vegetation Impacts:** Table 4.5.2.3-1 (Summary of Construction and Operation-related Disturbance states that 433 acres of Lowland Conifer/Hardwood; 722 acres of Montane Mixed Conifer and Mixed Conifer Hardwood; 3 acres of Western Juniper/Mountain Mahogany; 68 acres of Shrub Steppe; 17 acres of Westside Grassland; 2 acres of Eastside Grassland and <2.0 acres of Westside Riparian, Eastside Wetland/Riparian Wetlands will be crossed. The DEIS provides reference to documents on proposed wetland and waterway mitigation and some planting methods, however, there needs to be continued development of the BMP's for impacts to vegetation and soils in the pipeline corridor as erosion along pipeline corridors during and immediately following pipeline construction can hinder land restoration work, expose shallow laid pipes and risk negative impacts for on- and off-site fish and wildlife habitat resources (Hann et al.). Use of only native herbaceous, shrub, and tree species is prescribed in the DEIS. However; the establishment of vegetation using native grasses,	**Forest and Vegetation Impacts:** ODFW recommends the following: • Additional development of BMP's for pipeline vegetation/soil disturbance is recommended. • Only native herbaceous (grass/forb), shrub, and tree species be used for restoration of disturbed sites unless natives will be unsuitable for site stabilization or specific species of non-natives are recommended to wildlife forage value. The establishment of vegetation using native grasses, trees and shrubs (although preferable in most instances) may prove ineffective if there is a lack of understanding of local conditions and their influence on vegetation growth, poor plant/seed selection, inappropriate soil management practices and inadequate vegetation management plans. • Generally, ODFW recommends choosing: 1. In-kind native species are used to ensure local ecological integrity, 2. Use of species adapted to the local climatic and soil conditions, use species with appropriate engineering properties for erosion control, 3. Mixture of species with a range of establishment rates, including rapidly establishing species to colonize the area and stabilize the surface and slower establishing species which will determine the composition of the mature vegetation cover. • Surveying stocking density of forest vegetation on the third growing season across the pipeline route, not only selected segments. • Include prescriptions for restoring shrubs to the corridor, especially in Jackson County's designated deer winter range. Plans should include efforts to restore *Ceanothus spp*., which may require scarification.

	trees and shrubs is often ineffective if there is a lack of understanding of local conditions and their influence on vegetation growth, poor plant/seed selection, inappropriate soil management practices and inadequate vegetation management plans. Typically, choosing in-kind native species for revegetation helps ensure local ecological integrity. The use of species adapted to the local climatic and soil conditions include those with appropriate properties for erosion control and mixtures of species with a range of establishment rates. Mixtures should include rapidly establishing species to colonize the area and stabilize the surface and slower establishing species which may also influence the composition of the mature vegetation cover. The mitigation will need to address the permanent loss of vegetation and mitigate for the loss of function that will occur until the vegetation compares to pre-project conditions. Vegetation not directly on waters of the United States may still lead to impacts that have the potential to affect water quality. Human-induced fragmentation of the landscape is among the factors reducing the number of natural corridors and the possibilities of re-colonization	

	of plant and animal species with poor dispersal capacities. This is especially true of amphibians in forested habitats (Todd et. al). A mitigation plan needs to be developed that addresses project related forest, vegetation, and grassland impacts. In fact, the mitigation plan (Appendix I) provides documentation on wetlands and waterbodies, but does not address upland habitat and forest impacts. In the context of described limits to revegetation of the ROW, the currently proposed impacts to riparian areas may result in net loss of habitat function. The Applicant proposes to keep a ten foot wide area over the pipeline in an herbaceous state and a 30 foot wide area with no trees or shrubs greater than fifteen feet tall. If these impacts are unavoidable, they need to be addressed in the mitigation plan. **Monitoring of forest Vegetation (Erosion Control and Revegetation Plan) pg. 42 Table 13.13-1:** Monitoring of reforestation will take place the first and third fall following planting, on Lakeview BLM and Forest Service lands, but only the first year on the Coos, Roseburg, and Medford BLM	

	Districts and on Private Lands. No shrubs are included in the planting mix, except for Klamath County. Shrubs are an important component of upland habitats in southern Oregon. They are especially important as winter forage on deer winter range in Jackson County. *Ceanothus cunneatus* is especially important but may require seed scarification.	
Chapter 2.1.2-2.7.2 Chapter 4.6	**Non-Forested Habitats, Duration of Habitat Mitigation/Restoration Benefits Commensurate to Habitat Impacts:** The DEIS indicates that non-forested habitats within the temporary construction right-of-way would be restored relatively quickly. Shrub steppe habitats can take considerable time to restore to pre-project functional condition especially sage brush species which can take decades to regrow to their previous structural condition.	**Non-Forested Habitats, Duration of Habitat Mitigation/Restoration Benefits Commensurate to Habitat Impacts:** ODFW recommends impacts to habitats be quantified into reasonably likely time frames measured in years. ODFW recommends mitigation be proposed to compensate for the temporal loss of impacted and then restored habitats. ODFW recommends the functional benefits of mitigation meet or exceed the likely duration of impacts regardless of if they are estimated to be shorter term, longer term, or life of the project in duration.
Table 4.6.1-1, also Section 4.6.1.2 and Table 4.6.2-1	**Species Status Corrections:** The gray wolf is incorrectly labeled as delisted in the state of Oregon Western snowy plover nesting area on the North Spit likely to be impacted by increased recreational pressure associated with the new JCEP	**Species Status Corrections:** The gray wolf is still state-listed as Threatened in the western half of Oregon, including this project area. ODFW recommend the table be updated to reflect this potential impact to western snowy plovers.

	facility employees and construction crews. Short-tailed albatross is state-listed as endangered, but this section says no state status. In the Western snowy plover section, the DEIS does not mention the federal Habitat Conservation Plan which was approved by the USFWS in 2010. The four federally listed sea turtles discussed in this section are also state listed on the Oregon Endangered Species Act. In Table 4.6.2-1 the western snowy plover is omitted. Gray whale is a state endangered species, but has been federally delisted.	ODFW recommends the DEIS be corrected for state status of short-tailed albatross. ODFW recommends the DEIS consider how the proposed action aligns with decisions made in the 2010 Western Snowy Plover Habitat Conservation Plan. The DEIS should also discuss in this section how state agencies' actions on state-owned land are regulated through OAR 635-100-0000-0040. The DEIS should also reference that the plover was state listed in 1987. Sea turtles' state status should be included in the DEIS. The green sea turtle and leatherback sea turtle are listed as endangered on the OESA, and the loggerhead sea turtle is listed as state threatened. ODFW recommends the table be corrected to add in the western snowy plover. ODFW recommends correction for gray whale status as state endangered and federally delisted.
Chapter. 4.6.1, pgs.4-310-329 Table 4.6.1-1	**Species Occurrence/Status Species Corrections:** **Pacific Fisher:** Fisher are mentioned in the DEIS.	**Species Occurrence/Status Species Corrections:** ODFW recommends revision of information in the DEIS to reflect the following species occurrence/status information:

	However, Fisher may become a listed species in the near future and their presence has been documented in the PCGP route through BLM sampling efforts. **Oregon Spotted Frog:** This species is now federally listed. **Bald Eagle:** There are a number of nest sites known within a five mile distance of the pipeline route. **Western Pond Turtles and Yellow-legged Frogs** are not addressed in the T&E Section of the DEIS, however both of these species have been proposed for federal listing per the ESA. **Wolverines** are listed as threatened under the Oregon Endangered Species Act.	**Pacific Fisher:** ODFW recommends the Applicant considers how this project may contribute to a federal listing decision. **Oregon Spotted Frog:** ODFW recommends the Applicant conduct surveys to identify use of habitats in the pipeline corridor by this species. **Bald Eagle:** Department recommends nest surveys be completed to document bald eagle nesting locations within 1.0 mile of the pipeline route as well as consistent descriptions of nest surveys. **Western Pond Turtles and Yellow-legged Frogs**: ODFW recommends that FERC analyze effect for both of these species, and that they be included in the consultation with the USFWS. ODFW believes the determination will be a likely to affect for both species. **Wolverine:** ODFW recommends correction.
Section 4.6.2.2	California brown pelican – The DEIS states that "brown pelicans are regularly seen in moderate numbers during the summer months in Coos Bay". This is very out of date. Many more birds have recently been present along the Oregon Coast, attempted nesting activity has also occurred, and birds have also stayed later into the fall each year.	ODFW recommends correction.

Section 4.6.3.2	The ODFW responsibility for state-listed species under the Oregon Endangered Species Act is incorrectly omitted from this section. This section is also incorrect about ODFW authority for invertebrates – ODFW has authority for marine and intertidal invertebrates.	ODFW recommends correction.
2014 DEIS Appendix L Draft Biological Evaluation, pg. 97; **2019 DEIS** Not addressed	**Bald Eagle Impacts:** The draft Biological Evaluation lists only 2 nest sites within 1-5 miles of the proposed pipeline. A number of other nest sites exist on non-federal lands in Klamath County. The Draft Biological Evaluation states that disturbance to breeding individuals is not anticipated yet, construction activities are planned (pending waiver) for the Klamath County portion of the pipeline which could cause disturbance to nesting eagles. Bald eagles generally begin nesting in early February. Where in the DEIS are potential impacts to bald eagles addressed on non-federal lands?	**Bald Eagle Impacts:** ODFW recommends the Draft Biological Evaluation be updated to correct these inaccuracies and address potential impacts to bald eagles and nest sites on Federal and non-Federal lands. ODFW recommends the Draft Biological Evaluation also be updated to correct these inaccuracies and address potential impacts to bald eagles and nest sites during winter construction in Klamath County and on Federal and non-Federal lands alike.
Chapter 4.5; pg 4-191	**Eagle nests:** Permits are required to remove eagle nests	**Eagle nests:** If eagle nests are present, ODFW recommends the Applicant coordinate with USFWS prior to removal of potentially empty or abandoned nests to ensure compliance with the Bald and Golden Eagle Protection Act (BGEPA).
2014 DEIS Appendix L Draft Biological	**White-headed Woodpecker Impacts:** The Draft Biological Evaluation	**White-headed Woodpecker:** ODFW recommends correcting this information in the Draft Biological Evaluation to reflect adjustments to timber harvest management within the range of this species and

Evaluation, pg. 102 **2019 DEIS** Not addressed	states that timber harvest on federal lands target large diameter ponderosa pine. This was most certainly true in the past but since the 1990s, Forest Service standards and guidelines mostly prohibit harvest of trees greater than 21 inch diameter. A larger threat to white-headed woodpecker habitat is overstocked forest stands as a result of fire suppression and lack of disturbance.	impacts related to habitat transition.
2014 DEIS Appendix L Draft Biological Evaluation, pg. 120 **2019 DEIS** Western Pond Turtle distribution not updated	**Western Pond Turtle:** The Draft Biological Evaluation states that western pond turtles have not been documented on Fremont-Winema National Forest. However, they are documented on non-federal lands in Klamath County, specifically at proposed crossing at Klamath River and potentially at Lost River crossing. The Draft Biological Evaluation also states that in Oregon, WPT are found up to elevations of 3,000 feet, yet in Klamath County pond turtles are known to occur at elevations of 4,200 feet elevation and likely higher elevations. Potential impact to WPT is likely underestimated and should be reevaluated.	**Western Pond Turtle:** ODFW recommends correcting information for western pond turtle in the Draft Biological Evaluation.

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2014 DEIS Appendix L Draft Biological Evaluation, pg. 124, Lines 25-30 **2019 DEIS** Western Pond Turtle Nesting Habitat not addressed	**Western Pond Turtle Nesting Habitat:** The Determination of Effects with regard to the western pond turtle (WPT) states*: "In considering the potential direct, indirect, and cumulative impacts, it is determined that the proposed action "may impact individuals or habitat, but is not likely to contribute to a trend toward federal listing or loss of viability of the species" "for the Western pond turtle because impacts would be limited to dispersing individuals as there are no known nesting or overwintering sites within 1 mile of the Project on NFS land, and the Project would impact only approximately 3 percent of potentially suitable habitat within the analysis area."* This determination is based on limited and incomplete information regarding the known or potential presence of WPT in Coos, Douglas, Jackson, and Klamath Counties (see BE Page 120, Lines 25-28, and Page 122, Lines 16-20). To date comprehensive WPT surveys have not been conducted in Oregon, however, some work has been done. ODFW is aware of over 1630 records of captured animals from 69 unique sites within the four counties named above. It is likely local Department office observation databases contain many more observations. WPT nests are known to be very difficult to find, and can be located as far as ½ mile from their aquatic habitat. WPT are	**Western Pond Turtle Nesting Habitat:** ODFW recommends either the Applicant should conduct Western Pond Turtle nesting habitat surveys or should assume all habitats within ½ mile of a waterway or wetland known to contain Western Pond Turtles be assumed to be suitable nesting habitat if all of the below are present: • Clay soils are present; • Vegetation consists of primarily of sparse gasses and forbs; • The slope is less than 60%; • And the habitat is outside of the floodplain. Department biologists can assist the Applicant with narrowing down the likely locations of Western Pond Turtle nesting habitat.

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2014 DEIS; Chapter 4.6, pg. 525 2nd paragraph **2019 DEIS** There is no mention of raptor surveys	**Wildlife Survey Methodology #1:** The following discusses known raptor nest surveys: *"Surveys of known nests of raptor species with nesting buffers that intersect the pipeline right-of-way would be conducted prior to tree clearing. Those species include bald eagle, great gray owl, and peregrine falcon. If nests are active, clearing trees and disturbance by airplane or helicopter within buffers would be delayed until after the nesting period."* This statement raises the following questions/concerns: • When would the surveys occur? And if during the early part of the nesting season would there be follow up surveys to determine that the nest was truly inactive? For example, due to the possibility of re-nesting attempts, it would be premature to determine that a golden eagle nest was inactive prior to May 15th. • Some raptors have multiple nests and nest establishment can occur within a territory during the onset of any breeding season. Many raptors do not nest in the same nest on individual years. "Surveying known raptor nests" would not be sufficient to find and avoid new nests of established	**Wildlife Survey Methodology:** ODFW recommends the Applicant provide detailed documentation on proposed nest survey methodology including: • Protocols, survey timing, and minimum experience requirements for surveyors. • Information should be species specific and include means to address all four components of corresponding issue/concern. • Raptor nest surveys should occur for both known and new nests prior to clearing of the PCGP ROW. • The list of raptors identified for pre-timber falling surveys should be expanded to include golden eagle, northern goshawk, Swainson's hawk, flammulated owl, and short-eared owl. With the exception of golden eagle, which is a federally protected species, the other species are Oregon Conservation Strategy species and/or state Sensitive Species.

	pairs and surveying ahead of the construction would also be necessary to find and avoid nests of new raptor pairs that choose to nest in the pipelines path. The qualifications of personnel tasked with conducting the surveys and the survey methodologies are not provided. However, the potential for inappropriate survey methodologies or timing, and the use of unqualified personnel is a concern.	
2014 DEIS Appendix L, Biological Evaluation, pg. 7, Line 2-4 Not addressed in 2019 DEIS	**Wildlife Survey Methodology #2:** *"Initial surveys were conducted in the spring of 2007. Additional surveys were conducted in 2008 and 2010….."* In order to attain viable survey results, it is imperative that appropriate survey methodologies are used and the timing of surveys be tailored to each species life history. However, it is unclear (1) what survey methodologies were used; (2) when surveys occurred; (3) where the surveys occurred, or (4) which species were surveyed. One might assume red tree vole, northern spotted owl, and great gray owl as those are the only three vertebrate terrestrial species identified in the BE or EA for which surveys were reported.	**Wildlife Survey Methodology:** ODFW recommends the Applicant provide detailed documentation on proposed occurrence survey methodology including: protocols, survey timing, and minimum experience requirements for surveyors. Information should be species specific.
2014 DEIS	**Scope of Wildlife Surveys:**	**Scope of Wildlife Surveys:** Although surveying for

Appendix L, Biological Evaluation, pg. 9-23, Table 1. Not addressed in 2019 DEIS	Based the table of the 42 vertebrate species considered in the document, only 3 (7%) received surveys. 93% of all vertebrate species considered in the document did not receive surveys. ODFW is concerned that not only is the level of survey effort is insufficient to identify specific locations of all species identified by PCGP, and the lack of survey effort may have missed many other species not considered by PCGP. For example those species on the Oregon Conservation Strategy and state Sensitive Species lists that were not considered by PCGP.	every possible species and habitat which could occur along the alignment is beyond the scope of reasonableness, surveying for only 3 of 42 likely vertebrates may be too narrow of survey scope. ODFW recommends the Applicant complete some type of general wildlife surveys perhaps during the spring when the likelihood of observing many of the herptile, bird, and small mammal species would be likely. ODFW recommends any general wildlife survey methodology be coordinated with both ODFW and the USFWS prior to implementation to maximize efficiency and efficacy.
Chapter 4.5 pg 4-188-189; 4-211-217	**Noise and Direct Impacts to Wildlife:** The PCGG project will incur substantial disturbance due to direct interaction of construction activities as well as the associated noise. These impacts will likely displace a number of species including MAMU, NSO, and golden eagles, others during construction, with long-term impacts due to the change of the habitat with clearing of the pipeline route. "*We estimate that noise from general construction of the pipeline would*	**Noise and Direct Impacts to Wildlife:** ODFW has previously recommended that when any blasting, pile driving, or other loud noise producing activity takes place. ODFW requests clarification regarding the potential daily magnitude and duration of construction and operational related disturbances, and determination if these disturbances are likely to occur during periods when currently existing (non-related) disturbances are minimized or absent. ODFW recommends: • The Applicant consult the Oregon Forest Practices Act guidelines for ospreys and great blue herons protections; • The Applicant consult USFWS under the Bald and

	range from the Leq of about 93 dBA at 50 feet, to 85 dBA at 100 feet, and 72 dBA at 300 feet. *Ambient sound levels in much of the Pacific Connector pipeline route area probably would be similar to the Arcata Fish and Wildlife Office's projections (FWS 2006a)."* Construction noise concerns are considered a substantial disturbance factor for the sum of the PCGP project. It is unclear from the above if the timing of disturbance has been considered. For example, if construction of the terminal and related facilities will occur during a 24 hour period, or only during daylight periods.	Golden Eagle Protection Act for federal recommendations to protect bald and golden eagles nests; and, • The applicant consult with USFWS for potential impacts to snowy plovers; • The Applicant consults USFWS under the Federal Endangered Species Act for federal recommendations to protect spotted owls and marbled murrelets. ODFW recommends the Applicant re-analyze potential noise impacts to wildlife using a more robust and suitable methodology acceptable to ODFW and the USFWS. If further analysis indicates greater likely impacts to wildlife than this analysis estimates, those additional impacts should be avoided, minimized, and mitigated for (mitigation sequencing), as practicable and in collaboration with Department and USFWS.
Chapter. 4.5 pg. 4-273; 4.6, pg 4-324-329	**Conflicting Construction Timing Restrictions:** To date the PCGP application has only partially defined the timing of construction actions that will have impacts to fish and wildlife resources (e.g. stream crossings, marbled murrelet nesting, spotted owl habitat impacts). Managing the timing of impact is directly related to minimizing impacts (e.g. rainfall/water quality, sediment transport, nesting of murrelets). **Conflicting Avian Impact Avoidance Timing Restrictions:** Site clearing and timber	**Conflicting Construction Timing Restrictions:** ODFW recommends more fully developing defendable guidelines for: • Construction timelines and recommended timing restrictions in coordination with ODFW to minimize impacts to species that have specific vulnerability due low abundance and habitat selection. • The current documents still include potential for unresolved timing restriction and construction scheduling conflicts: i.e. conflicts between seasonal restrictions for bird nesting, winter range habitat, in-water work periods, and T&E species. • Conflicting Avian Impact Avoidance Timing Restrictions: ODFW believes potential impacts to Spotted owls and marbled murrelets from timber cutting, timber removal, clearing and grubbing, blasting, and any other form of disturbance could be further minimized during the breeding season. Specific buffer distances for each potential

	removal is to occur between October and March to avoid impacts to Spotted Owls and Marbled Murrelets. However, Chapter 4, page 4-637, 2nd and 3rd bullet state: • Blasting for the pipeline trench may occur within 0.25 mile of MAMU stands between April 1 and September 30; • Helicopter use for removal of timber during pipeline construction within 0.25 mile of 9 MAMU stands (7 occupied and 2 presumed occupied) during the breeding period (between April 1 and September 15) could occur and disturb MAMU adults and nestlings, as well as potentially blow nestlings out of the nest tree within 7 MAMU stands (5 occupied and 2 presumed occupied) from rotor wash. And further, on Chapter 4.6, Page 4-329: *Noise from blasting and helicopter use during pipeline construction within 0.25 mile of NSO sites during the late breeding season would occur and could increase the risk of predation to fledglings that are generally not as able to escape as adults during the latter part of the breeding season;* Based on the above, it appears timber cutting and grubbing will	disturbance type should be coordinated with the USFWS.

	occur outside the breeding season to protect spotted owls and marbled murrelets, but timber removal via helicopter and blasting at locations with spotted owls and marbled murrelets will occur during the breeding season. Biologically, protecting the birds from some forms of disturbance during the breeding season while allowing other forms of disturbance may not result in the overall desired avoidance and minimization outcomes for spotted owls and marbled murrelets.	
Chapter 4.1 pg 4-31	**Use of Blasting Mats to Minimize Noise Disturbance:** The following quote states that blasting mats will be used where the use of explosives is required: *"Blasting mats or padding would be used on all shots where necessary to prevent scattering of loose rock onto adjacent property and to prevent damage to nearby structures and overhead utilities."*	**Use of Blasting Mats to Minimize Noise Disturbance:** ODFW recommends that in order to minimize noise impacts to wildlife, blasting mats are used wherever the use of explosives is required.
Chapter. 4, pg. 4-181- Table 4.5.1.1-1; Table 4.5.1.2-3; Table	**Likely Underestimate of Migratory Bird Take:** Site clearing and timber removal is to occur between October and March to avoid impacts to Spotted Owls and Marbled Murrelet, but areas without either species will be grubbed	**Likely Underestimate of Migratory Bird Take:** ODFW recommends a complete reassessment of potential migratory bird take including direct and indirect take occur in coordination with the USFWS - Migratory Bird Program experts.

4.6.3.5-1	and cleared year round. This will result in significant take of migratory birds. Based on the 2014 DEIS there were estimates that 1660 individual birds were estimated to be displaced, resulting in the loss of close to 10,000 eggs/young by pipeline construction actions. The 2019 DEIS does not address this issue or make note. This estimate only considers take from physical clearing and grubbing, but does not include noise or other forms of take.	
Chapter 4.4.1.6; and Integrated Pest Management Plan (IPMP)	**Noxious Weeds/Invasive Plants:** Invasive species (e.g. noxious weeds) have been identified as one of the seven key conservation issues (threats to conservation) in Oregon in the Oregon Conservation Strategy (Oregon Conservation Strategy; ODFW 2005). Hundreds of thousands of dollars are expended annually on both public and private lands to combat invasion and expansion of noxious weeds and their deleterious effects on fish, wildlife, and their habitats. Specific invasive concerns include: • Gorse in the Coos Bay region	**Noxious Weeds/Invasive Plants:** ODFW recognizes the efforts of the Applicant in developing the "*Integrated Pest Management Plan".* However, ODFW recommends that the Applicant complete a more comprehensive noxious weed control plan prior to issuance of a site certification or completion of the NEPA process. ODFW recommends broader scale monitoring for noxious weeds, beyond the targeted sites discussed. ODFW recommends that performance metrics be included in order to document success or failure of the "*Integrated Pest Management Plan",* and that additional mitigation be undertaken if the final state of the pipeline is not satisfactory regarding avoidance, prevention, and minimization of noxious weeds.

	has had substantial negative impacts on elk production in the Coastal frontal zone. • Scotch broom is considered a substantial factor decreasing production of elk and deer forage across the Coast range and some of the interior locations of Oregon. • It is strategically important that equipment be cleaned prior to being mobilized from locations where gorse is present and when moving to different sections of the pipeline. • ODFW considers the risk of weed spread on mitigation sites and where mitigation measures are employed to likely be high rather than low. • ODFW is not listed as a consulting agency in the IPMP. The local ODA's weed expert did not know her agency had provided comments when contacted by ODFW. ODFW has concerns that the ODA may not have been coordinated with by the Applicant. • The IPMP states "These surveys were conducted by local biologists who are familiar with priority listed noxious weeds." ODA weed experts have previously expressed concern about people's ability to properly identify noxious weeds. ODFW expresses concerns relating to the credentials/experience of the biologists used? • Pacific Connector's Environmental inspectors	ODFW recommends wash stations for equipment be set up to handle aquatic invasive species as well. Equipment should be cleaned between individual subbasins at the HUC 6 level or if the machinery has been in a known area with invasive/noxious weeds. ODFW recommends that FERC include conditions outlining that the noxious weed plan have specific strategies (i.e. cleaning of equipment, monitoring, and control measures) for the JCEP project and individual reaches of the PCGP project. Mowing is considered a preferential treatment to herbicides when effective. ODFW recommends the Applicant acknowledge that the risk of invasion of noxious weeds on the pipeline route and mitigation sites is likely high and ensure the following: • ODFW recommends the Applicant fund an Oregon Dept. of Agriculture (ODA) weed extraction teams within the affected counties (See Appendix A, List 4). • ODFW recommends the PCGP project include ODFW in the list of agencies consulted and include our comments for noxious weed management. • ODFW recommends the Applicant describe the experience/qualifications of the staff used to conduct noxious weed surveys. • ODFW recommends the PCGP project should provide some level of assurance that environmental inspectors will have the capacity in their schedule to ensure noxious weed management concerns are addressed. • ODFW recommends that EI's should inspect new equipment arriving on site. Any protections given to federal lands should also be given to non-federal lands • ODFW recommends the PCGP project develop an incentive/dis-incentive program to greatly increase the likelihood the potential for a contractor driven inspection system (with random EI investigations)

	will make determinations about washing equipment. How will decision of environmental inspectors be protected from logistic pressures? • IPMP notes contractors will inspect their own equipment prior to moving from construction yards to federal lands. This brings up two issues: 1. Can contractors adequately perform their own inspections? 2. Why is there a distinction between federal and non-federal land for the noxious weed management efforts? • The IPMP notes that EI's will perform random inspections. What kind of consequence will there be if inspections fail? Is there a reward system for compliance? • The IPMP indicates that during reclamation the contractor will return any graded material to infested sites. • The IPMP has indicated cleaning stations will be established at borders of NFS lands and on adjacent BLM lands. • The IPMP indicates that extra monitoring will occur along the ROW in areas with increased likelihood of noxious weed contamination (i.e. known infestations, hydrostatic testing stations) on federal lands for 3-5 years after construction, with additional surveys for 3	to function effectively. • ODFW recommends a buffer should be applied to known noxious weed infestation areas. Accordingly, soil should not be moved out of these sites. These sites should be treated to prevent spread of noxious weeds to uninfested areas. • ODFW recommends that protection measures for federal lands should also be applied to non-federal lands. • ODFW recommends the PCGP project needs to provide extended monitoring at known infestation sites, dewatering stations, and all other high-risk sites on private lands as well. Monitoring the ROW only likely inadequate. ODFW recommends that PCGP employ independent consultant noxious weed specialists to conduct periodic on-going monitoring to maintain a sufficient level of certainty that noxious weed issues are addressed. Periodic monitoring needs to be completed for the life of the project on all disturbed ground with special emphasis at known infestation, dewatering stations, and equipment cleaning locations.

	years after presumed eradication. The IPMP details that monitoring of disturbed sites will occur throughout the life of the project by PCGP operational personnel. Properly identifying noxious weeds before they are fully established is an acquired skill. ODFW has concerns with the PCGP ensuring continuous monitoring capable of documenting invasive weeds effectively.	
Erosion Control and Revegetation Plan, Chapter 10.10 Erosion Control and Revegetation Plan, Chapter 10.9-1, pg. 33	**Seeding Prescriptions:** **Timing of Seeding** The ECRP calls for seeding to be conducted within 6 days of final grading, weather and soil conditions permitting, according to FERC's Upland Plan. Seeding in late winter for potions of the ROW in Klamath County could be too late for successful revegetation. This may require coming back the next fall/early winter to conduct seeding to insure that revegetation objectives are met. **Seed Mixes:** Specific Seed Mix 6 and 7 could be improved upon to be more effective and provide greater wildlife habitat function.	**Seeding Prescriptions:** **Timing of Seeding: ODFW recommends** the Applicant plan for additional seeding as a contingency if the initial seeding occurs too late to be effective **Seed Mixes:** ODFW recommends: • For Seed Mixture 6, recommend addition of bitter cherry and serviceberry as shrub species to be seeded for M.P. 181-198 in Klamath County, in addition to antelope bitterbrush and birchleaf mountain mahogany. • For Seed Mixture 7, recommend addition of curleaf mountain mahogany to be seeded for M.P. 198-228 in Klamath County in addition to antelope bitterbrush. ODFW recommends that private properties be surveyed prior to construction to determine if non-native plants are dominant. Non-native seed mixes should only be used on properties that already have a significant presence of non-native seed. • Some of the non-native grasses listed tend to establish permanently and out-complete native grasses. Replace non-natives such as bentgrass, red fescue, tall fescue, and ryegrass (annual or perennial) with blue wildrye, California brome, or California oatgrass.

		• Where needed to compete with established non-native plants (as determined by pre-surveys) ODFW recommends the following non-natives: timothy, orchard grass, white clover, red clover, birdsfoot trefoil, and subterranean clover.
ES pgs Chapter 4.6; 4.7 Integrated Pest Management Plan Chapt. 1, Chapt. 2, Chapt. 4, Chapt. 5, Chapt. 6, Chapt. 7. Erosion Control and Revegetation Plan, Chapter 12.9-1, pg. 51 Chapter 4.5 pg. 458	**ROW Maintenance:** Maintenance of the PCGP Right of Way (ROW) will likely restrict natural revegetation, particularly any larger tree or shrub recruits which exceed allowable height thresholds. The method of management (herbicides or mechanical) has potential to impact the capacity, albeit highly altered to support some wildlife. From experience on previous utility ROWs, herbicides were used to control vegetation resulting in erosion and lack of vegetation for wildlife forage and habitat. **Mowing of ROW Corridors:** The DEIS indicates that there will be moving to maintain the 30-foot wide pipeline corridor maintenance from April 15th to August 1, during the growing season. Conducting vegetation clearing during this time frame will likely impact nesting grassland and shrub-adapted birds.	**ROW Maintenance:** ODFW recommends use of mechanical means to maintain the ROW, with use of herbicide as an exception. An exception would be in cases where herbicides may be necessary to control noxious weeds at specific locations with specific difficult issues, which should be defined by the Applicant. ODFW recommends that if herbicides are needed at specific locations, weeds be spot sprayed. **Mowing of ROW Corridors:** ODFW recommends maintaining corridor vegetation from September-November to more effectively avoid potential impacts during migratory bird nesting periods.
General	**Capping Piling to Prevent Perching:** For both the JCEP and PCGP project ODFW recommends fitting any new pilings with devices to prevent	**Capping Piling to Prevent Perching:** Predatory piscivorous birds strategically perch around industrial facilities on piling that do not have measures to eliminate the ability of these birds to perch/roost. Ecologically the relevance is related to an increased capacity to feed within the area and impact species

	perching of piscivorous birds. This is a standard request from ODFW to Applicants on Fill/Removal permits when the Applicant installs pilings. These caps are readily available.	such as fall Chinook, coho salmon, and steelhead juveniles. If additional perch locations are created for piscivorous birds as a result of the proposed project, predation on resident and juvenile fish will likely increase along the project, and would be of particular concern in the vicinity of the project terminus at Coos Bay and near larger rivers such as the South Coos River, South Umpqua, and Rogue.
Chapter 4.5 misc. Recreation Management Plan (RMP)	**Direct Mortality of Terrestrial Wildlife Species Due to Collisions with Construction Related Traffic:** What conditions will be required to minimize vehicle collisions. A fairly high number of deer vehicle collisions were documented during construction of the Ruby Pipeline in eastern Klamath County. In addition, there very likely were numerous other wildlife species killed by construction vehicles (small avian species, small mammals, etc.) Will there be additional mitigation for direct mortality of wildlife species? **Off-Highway Vehicle Barriers:** Road closures on pipeline access roads that do not have other utility will be critical to reducing impacts to species such as elk, MAMU, and NSO. Closure of these roads will also reduce winter travel and damage related to recreational motorsport activities that commonly occur in wetlands	**Direct Mortality of Terrestrial Wildlife Species Due to Collisions with Construction Related Traffic:** ODFW recommends the Applicant develop and enforce credible series construction traffic related BMPs such as speed limits to minimize direct mortally of wildlife due to collisions with construction related traffic. **Off-Highway Vehicle Barriers:** ODFW recommends revisiting analysis and discussion of methods for ensuring that road closures are effective during and post-construction. • Off-highway vehicle (OHV) barrier proposals were modified by the Applicant through previous comments from ODFW to include boulders and tank traps in addition to signage. • ODFW recommends that contingencies be planned in case the proposed OHV exclusion efforts prove ineffective. Such contingencies may require maintenance measures. • ODFW recommends security patrols along ROW to discourage OHV use. • ODFW recommends a regular schedule for inspection of all OHV barriers along the pipeline route and repair OHV barriers throughout the life of the project. Where necessary exclusion devices should be upgraded. • ODFW recommends the PCGP project develop a plan in coordination with ODFW to Plan to mitigate for OHV damage at least in part by Funding law-enforcement patrols within the Jackson TMA, and purchasing and restoring property that has been previously damaged.

	and streams. Anti-OHV devices are passive and as such will likely only detect damage as it occurs with no capacity to prevent OHV impacts directly when they are occurring. There is no mention of monitoring of the effectiveness of the OHV barriers in the RMP. Despite best management practices and patrols, illegal use of the ROW by OHVs is expected to occur. The need for mitigation should be expected by the PCGP project. ODFW notes that there are numerous locations in the pipeline route where OHV issues occur. ODFW works cooperatively with partners to maintain Travel Management Areas in the Camel Hump and Obenchain areas to minimize OHV disturbance to wintering wildlife. Department staff is available for consultation on minimizing impacts in these areas.	
General	**Environmental Inspectors:** ODFW fully recognizes that properly trained environmental inspectors are able to greatly increase the potential for maximizing habitat	**Environmental Inspectors:** ODFW recommends that the Applicant determine the number of environmental inspectors they will need and coordinate with state and federal agencies depending on the training they will receive.

	conservation measures.	ODFW recommends that the PCGP project have environmental inspectors on all active construction segments of the pipeline project.
General	**Public Communications:** There is currently a significant need for a representative of the JCEP/PCGP project to serve as a public communications specialist to the project area constituents. Additionally, there is a need for planning regarding how recreational users of fish and wildlife resources in Coos Bay and along the pipeline route will obtain information concerning the project: e.g. will recreation be restricted at the JCEP site, mitigation site access, pipeline route access; access to the PCGP corridor during construction, etc.) Restrictions to recreational accessibility can result in substantial impacts to the local economic conditions of affected communities.	**Public Communications:** The JCEP/PCGP project needs to develop a project communication plan in collaboration with ODFW to consult with and inform fishing groups and other recreational users on construction actions on a real time basis. Including but not limited to: • Will recreation (clamming, crabbing, and duck hunting) be restricted at the JCEP site during construction/following construction? • Will mitigation sites (Kentuck, wetland mitigation sites) be open to public recreation, hunting, and fishing access during construction/following construction? • Will the pipeline route be open to access for fishing and hunting (the route will cross major salmon and steelhead fishing streams as well as historical hunting locations) during construction/following construction? • Will the Coast Guard restrict recreational access to any portion of the bay, other than the shipping channel during the period when a LNG ship is moving into or out of the bay. Will there be safety restrictions on any portion of the bay when the ship is docked in the slip? • How and where will any residual impact to public access or recreational opportunities be fully mitigated?

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Oregon Department of Geology and Mineral Industries

The Oregon Department of Geology and Mineral Industries (DOGAMI) is providing review comments on the Draft Environmental Impact Statement (DEIS), dated March 2019, and relevant supplemental resource reports, dated September 2017.

DOGAMI finds the information in the DEIS to be incomplete; has comments on DOGAMI's regulatory requirements; has comments about possible deficiencies in the scientific and engineering analyses relating to geologic hazards; and at this point is not satisfied that regulatory requirements will be met and geologic hazards will be adequately addressed to ensure public safety. We provide herein 1) General Review Comments, and 2) Specific Comments on the DEIS.

As noted in our comments, DOGAMI is reiterating a number of unresolved comments on JCEP and PCGP resource reports that were first included in a memo to the Oregon Department of Energy (ODOE), dated November 6, 2017 (https://www.oregon.gov/energy/facilities-safety/facilities/Documents/JCEP-PCGP/2017-11-06-DOGAMI-Comments.pdf). At that time, DOGAMI found that many geologic hazard analyses were inadequate. Now, DOGAMI is concerned that key portions of the DEIS were insufficiently prepared, and in some cases either wrong or inadequate. This raises questions about the process undertaken to develop the DEIS and, more importantly, elevates DOGAMI's concerns about public safety.

DOGAMI has regulatory and statutory authority on mining operations and building of certain structures in the tsunami inundation zone. The Applicant must comply with Oregon laws and Oregon building code requirements. This includes Oregon Revised Statute Chapter 517.750(16)—the JCEP project will need one (1) Operating Permit for the LNG terminal facility and the PGCP project will need one (1) or more Operating Permits for the pipeline facility, any applicable requirements of ORS 455.446-455.447 and Section 1803.2.1 Tsunami Inundation Zone of the Oregon Structural Specialty Code (Oregon Revised Statutes [ORS] 455.446 and 455.447).

Thank you for the opportunity to assist with this project. If you have any questions, please contact me at 971-673-1555 (brad.avy@oregon.gov) or Yumei Wang at 503-913-5749 (yumei.wang@oregon.gov).

Sincerely,

Brad J. Avy

Director and State Geologist

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General Review Comments

Geologic hazards are prevalent in the proposed project area. The proposed project is in a high seismic hazard area due to the Cascadia Subduction Zone, which can produce a magnitude 9 earthquake, and the proposed JCEP terminal facility is located in the Cascadia tsunami inundation zone. If all geologic hazards are not carefully identified and addressed before design and construction, then the possible impacts could negatively impact human and environmental safety. Significant earthquake hazards include but are not limited to the Cascadia Subduction Zone and crustal faults (e.g., Basin and Range faults), especially in Klamath County. Landslide hazards exist in the coastal plains, Coast Range, Klamath Range, Cascade Range and Basin and Range.

DOGAMI's concerns relate to the expected performance of the proposed facilities, the possible impacts and the safety of people. Geologic hazards have not been adequately characterized and proposed mitigation of the hazards is incomplete. Specific unresolved concerns include:

1. Key portions of the DEIS were insufficiently prepared, and in some cases either wrong or inadequate, raising questions about the process undertaken to develop the DEIS (i.e., a lack of sufficient Applicant technical review), which could lead to adverse consequences for public safety;
2. Seismic hazards, including Cascadia earthquakes and identification, characterization and mitigation of quaternary faults and their hazards;
3. The long duration of shaking expected with a magnitude 9 earthquake;
4. Ground failure of the softer and looser soils, including earthquake-induced liquefaction and lateral spreading;
5. Landslide hazards, including earthquake-triggered landslides, require the use of lidar to identify as a first step in characterizing hazards and proposing mitigation;
6. Tsunami hazards analyses, including tsunami hazards with the proposed channel and estuarine modifications, and how currents, debris and ballistics may negatively impact the surrounding areas and safety of people;
7. Tsunami scour in the nearby area, including dynamic erosion of the North Spit dunes, and how the Maximum Considered Tsunami (MCT), that is, the design tsunami, may impact the local landforms, proposed facilities, nearby development and safety of people;
8. Tsunami design criteria. Will the design meet and/or exceed the minimum design requirements specified in the International Building Code's reference to the American Society of Civil Engineers 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures Chapter 6 on Tsunami Loads and Effects?;
9. Tsunami safety action plans, including tsunami evacuation plans and an evaluation of the response time to mobilize an LNG vessel during a distant tsunami;

10. Appropriate application of best management practices (BMP). For example, the best practice described in the DEIS using slope gradients to define where BMPs are implemented during construction is inadequate;
11. Instrument monitoring safety programs. For example, the landslide monitoring method described in the DEIS would not allow adequate time to mitigate landslide hazards during a Cascadia earthquake where many co-seismic landslides could be simultaneously triggered in direct response to the shaking; and,
12. Dependencies on existing infrastructure, such as roads and levees, which may fail during disasters causing safety concerns.

DOGAMI encourages designing and building for ***disaster resilience*** and ***future climate*** using science, data and community wisdom to protect against and adapt to risks. This will allow people, communities and systems to be better prepared to withstand catastrophic events and future climate—both natural and human-caused—and be able to bounce back more quickly and emerge stronger from shocks and stresses. This includes:

- Using best practices supporting public safety
- Using a long-term view to protect citizens, property, environment, and standard of living
- Integrating resilience, where possible, by avoiding high risk areas or embracing higher performance standards than may be required by building codes and regulations. This will lessen damage and speed recovery after disasters and improve continuity of operations.

Finally, all relevant laws and regulations (e.g., State of Oregon's Oregon Revised Statutes, Oregon Administrative Rules, Oregon building codes, Federal Laws, and local regulations), standards, guidelines should be met, clearly documented and, where helpful, explained. Additional site-specific geologic and tsunami hazard evaluations and proper mitigation of hazards are required to ensure public safety. All methods should be documented and described, including assumptions and uncertainties.

Specific Comments on the DEIS

Citation	Issue Identification	Recommended Resolution
1.5.1 Federal Environmental Laws, Regulations, Permits, Approvals, and Consultations: Table 1.5.1	Oregon Department of Geology and Mineral Industries – Mineral Land Regulation and Reclamation (MLRR) Program is not listed as a permitting agency in Table 1.5.1. The JCEP project will need one (1) Operating Permit for LNG terminal facility and the PGCP project will need one (1) or more Operating Permits for the Pipeline per Oregon Revised Statutes (ORS) Chapter 517.750	Include DOGAMI – MLRR as a State permitting agency in Table 1.5.1
1.5.2 State Agency Permits and Approvals: Section 1.5.2.1, Page 1-30	Add DOGAMI-MLRR to text in Section 1.5.2. The JCEP project will need one (1) Operating Permit for LNG terminal facility and the PGCP project will need one (1) or more Operating Permits for the pipeline per Oregon Revised Statutes (ORS) Chapter 517.750	Add DOGAMI MLRR to section 1.5.2.1, page 1-30: The mission of the DOGAMI is to provide earth science information **and regulation** to make Oregon safe and prosperous. DOGAMI identifies and quantifies natural hazards, and works to minimize potential effects of earthquakes, landslides, and tsunamis. Its administrative rules at OAR chapter 632 includes the identification of Tsunami Inundation Zones under division 5. The agency is also the steward of Oregon's mineral resources, and it regulates mining activities, and oil and gas exploration and production on non-federal lands. **The JCEP and PGCP projects fall under the definition of "surface mining" under ORS Chapter 517.750(16). The JCEP project will need one (1)**

		Operating Permit for the LNG terminal facility and the PGCP project will need one (1) or more Operating Permits for the pipeline facility.
2.1.3 BLM and Forest Service Land Management Plan Amendment Actions (whole section)	Any quarry sites, on land managed by the BLM or Forest Service, used as aggregate material sources for ANY construction activities related to either the JCEP or the PGCP facilities, will need to obtain either Exclusion Certificates (excavating less than or equal to 5,000 cubic yards) or mine Operating Permits (excavating more than 5,000 cubic yards) from DOGAMI – MLRR. Note quarries permitted under DOGAMI permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used for permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	Identify ALL quarry site locations via coordinates (latitude and longitude) that will be used as sources of construction aggregate. Identify ALL quarry site locations via coordinates (latitude and longitude) that will be used as fill disposal. Ensure that ALL quarry sites used as sources of construction aggregate are covered under Exclusion Certificates or mine Operating Permits issued by DOGAMI – MLRR. Any of those sites used for the disposal of fill must have approved fill plans on file with DOGAMI – MLRR.
2.4 CONSTRUCTION PROCEDURES (whole section)	Any quarry sites used as aggregate material sources, for construction activities related to either the JCEP or the PGCP facilities that excavate more than 5,000 cubic yards of material need to obtain mine Operating Permits prior to initiating excavation/construction activities.	Place a requirement and/or a condition ensuring that ALL quarry sites used as aggregate material sources, for construction activities related to either the JCEP or the PGCP facilities that excavate more than 5,000 cubic yards of material obtain mine Operating Permits prior to initiating excavation/construction activities.
3.4 PIPELINE ROUTE ALTERNATIVES AND VARIATIONS (whole section)	The PGCP requires one (1) or more Operating Permits from DOGAMI (as noted above). DOGAMI cannot have overlapping permit boundaries covering the same land. Therefore, the pipeline route must avoid intersecting the permit boundary of any quarry site that is covered under a DOGAMI Operating Permit. Any areas where there is the	Require that the pipeline route avoid the permit boundary for any quarries covered by existing DOGAMI Operating Permits.

	potential for overlap of two or more Operating Permit boundaries must be resolved in advance of DOGAMI permitting.	
Section 4.1.2.2 Mineral Resources – Mine Hazards - Heppsie Quarry (pg 4-10) pdf pg. 198/1120	The Heppsie Quarry site will need to be covered under a DOGAMI Operating Permit prior to the excavation of aggregate for construction activities.	Place a requirement and/or a condition ensuring that ALL quarry sites used as aggregate material sources for construction activities related to either the JCEP or the PGCP facilities that excavate more than 5,000 cubic yards of material obtain mine Operating Permits prior to initiating excavation/construction activities.
Section 4.1.2.5 Rock Sources and Permanent Disposal Sites (pg 4-25 and 4-26) pdf pg. 213/1120	As noted above: Any quarry sites used as aggregate material sources for ANY construction activities related to either the JCEP or the PGCP facilities, will need to obtain either Exclusion Certificates (excavating less than or equal to 5,000 cubic yards) or mine Operating Permits (excavating more than 5,000 cubic yards) from DOGAMI – MLRR prior to the initiation of excavation activities. Further, quarries permitted under DOGAMI Operating Permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used for permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	Place a requirement and/or a condition ensuring that ALL quarry sites will have the appropriate certificate or permit issued by DOGAMI in advance of initiating excavation activities. Any of those sites used for the disposal of fill must have approved fill plans on file with DOGAMI – MLRR.
Section 4.1.2.6 Blasting During Trench Excavation pg 4-27 pdf pg. 215/1120	Ensure that there are no impacts from blasting to properties not owned or under the control of the PGCP permittee. Ensure that ALL federal guidelines for quarry blasting are followed (NFPA 495 Ch. 11).	Place a requirement and/or a condition prohibiting impacts beyond the right-of-way boundary under the control of the PGCP permittee. Place a requirement and/or a condition requiring that the federal guidelines for quarry blasting are followed (NFPA 495 Ch. 11).
Section 4.1.3.2 Mineral Resources on	Any quarry sites, on land managed by the BLM or Forest Service, used as aggregate material sources for ANY construction activities related to either the JCEP or the PGCP	Place a requirement and/or a condition ensuring that ALL quarry

Federal Lands pg 4-35 pdf pg. 223/1120	facilities, will need to obtain either Exclusion Certificates (excavating less than or equal to 5,000 cubic yards) or mine Operating Permits (excavating more than 5,000 cubic yards) from DOGAMI – MLRR. Note quarries permitted under DOGAMI permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used for permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	sites used as aggregate material sources, for construction activities related to either the JCEP or the PGCP facilities that excavate more than 5,000 cubic yards of material obtain mine Operating Permits prior to initiating excavation/construction activities.
Section 4.1.3.3 Rock Sources and Permanent Disposal Sites on Federal Lands pg 4-36 pdf pg. 224/1120	Quarries permitted under DOGAMI permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used for permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	Place a requirement and/or a condition ensuring that ALL quarry sites covered under DOGAMI Operating Permits have a fill plan approved by DOGAMI prior to being used for permanent fill disposal.
4.2.1.2 Project-Specific Soil Limitations pg 4-44 pdf pg. 222/1120	The DEIS notes that some soils at the JCEP terminal site may not meet DEQ's definition of Clean Fill (OAR 340-093-0030(18). A fill plan per OAR 632-030-0025(bb) is required as part of the Operating and Reclamation Plan prior to placement of permanent reclamation fill. All fill must meet DEQ's definition of clean fill or be specifically authorized for placement in writing by ODEQ.	Place a requirement and/or a condition ensuring that a fill plan per OAR 632-030-0025(bb) is required as part of the Operating and Reclamation Plan submitted to DOGAMI as part of the Operating Permit application for the Terminal site.
4.2.2.3 Pipeline-Specific Topics - Soil Limitations - Reclamation Sensitivity pg 4-60 pdf pg. 248/1120	The approved EIS revegetation plan for areas identified to be revegetated in this section should be included in the Operating and Reclamation Plan submitted to DOGAMI as part of the Operating Permit application for the Terminal site.	Place a requirement and/or a condition ensuring that the revegetation plan be consistent with the Operating and Reclamation Plan submitted to DOGAMI as part of the Operating Permit application for the Terminal site.
Appendix D Table D-7 Rock Sources and Permanent Disposal Sites identified for the	These sites will need to obtain either Exclusion Certificates (excavating less than or equal to 5,000 cubic yards) or mine Operating Permits (excavating more than 5,000 cubic yards) from DOGAMI – MLRR. Note quarries permitted under DOGAMI permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used	Place a requirement and/or a condition ensuring that ALL quarry sites will have the appropriate certificate or permit issued by DOGAMI

construction of the pipeline pg D7-1/7-2	for permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	in advance of initiating excavation activities. Any of those sites used for the disposal of fill must have approved fill plans on file with DOGAMI – MLRR.
Appendix F.10, Appendix Q Overburden and Excess Material Disposal Plan	DOGAMI issues life of mine permits. Material placed in DOGAMI permitted sites as reclamation backfill cannot be considered temporary. Permanent areas should be identified for those currently designated as "Permanent or Temporary".	Acknowledge that material placed in DOGAMI permitted sites as reclamation backfill cannot be considered temporary. If the placement is temporary the material must be removed from the disposal site prior to the closing of the DOGAMI permit.
4.14 CUMULATIVE IMPACTS – Appendix N, Table N-1 pg N-1 to N-8	Activities listed in the past, present, or reasonably foreseeable actions that may need to be permitted by DOGAMI. Instances where the pipeline is in proximity to existing quarry operations may require modification to those quarries blasting plans to prevent impacts to the pipeline. Any aggregate sources used for construction may need DOGAMI Exclusion certificates or Operating Permits. Any additional gas wells or activity associated with the (MEC) coal bed methane sites may need additional permits from DOGAMI.	Acknowledge that past, present, or reasonably foreseeable actions may require additional permitting and/or approvals from DOGAMI – MLRR.
DEIS Section 13.3 Natural Hazards and Conditions; starting on page 17	DOGAMI concludes that the current level of geologic hazard evaluations and proposed mitigation are inadequate to ensure public safety.	DOGAMI recommends that additional site-specific geologic and tsunami hazard evaluations and proper mitigation of hazards are performed to ensure public safety.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. DEIS states that there are two primary mechanisms for generating earthquakes of design significance along pipeline route, CSZ event and local earthquakes associated with Klamath Falls seismic "hot spot". This list should include intraplate earthquakes in the subducting slab, and seismicity in the Klamath Falls area is only a seismic "hot spot" because of the occurrence of two M 6 earthquakes in 1993 and their associated aftershocks, otherwise the seismicity of the area	Revise assessment of major earthquake source zones with accurate and properly referenced information and include intraplate earthquakes.

	is not unusual.	
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS incorrectly states that there were two large (M 6.3 and 7.0) earthquakes in the area in 1873. There was only one, its location and magnitude are poorly constrained, and it has been interpreted by many as an intraplate event.	Revise description of major historic earthquakes with accurate and properly referenced information.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS notes that most of the pipeline construction area has experienced few historical earthquakes but fails to note that the period of historical record is short in this lightly populated region, and that the historical record is probably only complete for magnitudes > ~4.	Revise description of major historic earthquakes with accurate and properly referenced information. That includes discussion of the completeness and length of record.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS appears to base its assessment of geologically mapped faults along the pipeline alignment on an outdated and very small scale statewide geologic map (Walker and McLeod 1991).	Revise assessment of geologically mapped faults with up to date information from DOGAMI digital geologic map (OGDC-6) at a minimum, preferably by reference to all existing geologic maps along alignment. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS states that most faults along the pipeline alignment are not considered active in the USGS Quaternary fault database. DOGAMI staff have identified dozens of active faults in Oregon over the last decade using high resolution lidar data, virtually none of which were in the USGS database. The database is incomplete and inaccurate and should not be used as the sole source of information about fault activity.	Revise assessment of geologically mapped faults by study of the high resolution lidar topography for the entire pipeline alignment. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS states that many earthquakes of M 2 or larger have occurred	Accurately and consistently characterize historical seismicity in the Klamath Falls area and assess its tectonic

	during historical times in the Klamath Falls area, in direct conflict with an earlier statement that very few historical earthquakes have occurred along the pipeline alignment. It notes a geographic association of these events with the boundary between the Basin and Range and Cascade Range but fails to note that the virtually all recorded earthquakes in the area are aftershocks from the 1993 M 6 events.	significance with updated references. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-12	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate, detailed or referenced to ensure public safety. The DEIS lists earthquake-induced landslides as one of the primary seismic hazards to pipelines. This statement is true, and earthquake-induced landslides are arguably one of the greatest threats to the proposed pipeline, yet there is no evaluation of the hazard in the Seismic and Related Hazards section and only a cursory and totally inadequate mention in the landslide hazard section.	Provide an in-depth, quantitative evaluation of the potential for earthquake induced landslides along the segments of pipeline where expected ground shaking is high enough to potentially trigger such events. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-12	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate, detailed or referenced to ensure public safety. The DEIS asserts that empirical studies “demonstrate that welded steel pipelines are not prone to failure during earthquakes”, which overstates conclusions of the references cited to support it. One of the two studies cited indicated that during the 2011 Tohoku M 9 subduction earthquake, welded steel water pipe experienced failures at a rate of 1 per ~ 10km, which contradicts the assertion that such pipelines are not prone to failure.	Revise the assessment of pipeline vulnerability with consistent and properly referenced information. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparent lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS notes the distinction between earthquake magnitude and ground motion, which while correct is such a basic distinction that it is questionable to be included in an engineering seismology discussion for a major project like this. Probabilistic spectral ground motions are the standard of practice for this kind of design, and the DEIS should detail how the study was done, including methods, data and assumptions used.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS states that the pipeline would be designed using PGA values that correspond to an M 8-9 CSZ	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire

	earthquake and a specific return period (a deterministic hazard assessment, though the range of M 8-9 is huge), but the standard of practice for such design is to do a probabilistic seismic hazard assessment (PSHA). Regardless of whether the intent is to design using deterministic or probabilistic ground motions, the DEIS should present the most current recurrence and probability data for Cascadia earthquakes. There is no discussion, in this section or Section 4.13.1.5 (Earthquakes, Tsunami and Seiche) of Cascadia recurrence or probability. The issue of up-to-date Cascadia recurrence information was raised in the DOGAMI November 6, 2017 review memo (comment 19), and has still not been adequately addressed.	pipeline using accurate and up to date methods and data, and specifically addressing Cascadia recurrence.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS asserts that the USGS has prepared a PSHA for the US in general (true) and "for the region that would be crossed by the pipeline in particular" which is true only in that the pipeline area is in the US. The DEIS also cites the wrong reference for the USGS National Seismic Hazard Maps (NSHM), instead referencing the Quaternary Fault Database, which is one dataset underpinning the NSHM.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS states, "PGAs for the Project were calculated for the specific 475-year and 2,475-year return periods and the site-specific PGA of 0.5g for each corresponding milepost interval of the pipeline alignment". This statement does not make sense. The issue of providing clear and complete ground motion information was raised in the DOGAMI November 6, 2017 review memo (comment 10), and has still not been adequately addressed.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS and the lack of accurate use of data suggests that it may not be relied on to ensure public safety. The DEIS states "The highest 475-year return period PGAs expected along the pipeline alignment are about 17 percent (MP 0 to 2.0 and MP 9R to 16BR) of gravity." This is not supported by data and appears to be incorrect. The USGS NSHM 2014 PGA data for the 10% in 50 years return period has values that range from 10.5%g to 29.5%g for sites within 5 km of the pipeline alignment. The issue of providing clear and complete ground motion information was raised in the DOGAMI November 6, 2017 review memo (comment 10) and has still not been adequately addressed.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data. Accurately report data from USGS NSHM.

DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS follows the previously referenced statement about probabilistic PGA values for the pipeline with "The University of Washington (2001) noted that these intensities are moderate and relate Instrumental Intensity VIII and a "Moderate to Heavy" potential damage to aboveground structures as described by the Modified Mercalli Intensity scale". There is no place in a modern PSHA discussion for the conflation of probabilistic ground motions with seismic intensities, which very crudely quantify earthquake effects. Intensity is completely irrelevant to designing a pipeline, and its inclusion in this paragraph suggests that the DEIS preparer has little expertise in seismic hazard assessment.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-14	DOGAMI is concerned that the reliance on literature for determining whether there are active faults along the pipeline alignment may miss potentially hazardous fault crossings and result in a pipeline design that fails to ensure public safety. High resolution lidar is publicly available for approximately 99% of the pipeline alignment, and it should be evaluated by a trained professional geologist for geomorphic evidence of young faults beyond those identified in the literature. In the last 10 years, DOGAMI has identified dozens of previously unknown active faults by this method, and we know that the USGS Quaternary fault database contains only a small percentage of the actual active faults present in Oregon. The issue of inadequate fault hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 23, 24, 25, 34) and has still not been adequately addressed.	Conduct a detailed evaluation of lidar topographic data along the pipeline alignment for evidence of Quaternary surface faulting. Follow up on any identified features with appropriate field investigations including trenching if warranted. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-14	DOGAMI is concerned that the DEIS has overlooked or ignored published information about Quaternary faults crossed by the pipeline alignment, and this oversight fails to ensure public safety. Near mile 215, the pipeline alignment crosses the Adams Point Fault, which forms 2-4 m scarps in latest Quaternary lake sediments (DOGAMI Open File Report 03-03). The issue of inadequate fault hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 23, 24, 25, 34) and has still not been adequately addressed.	Properly evaluate the hazard associated with the Adams Point fault and design any necessary mitigation measures.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-16	DOGAMI is concerned that scope limiting assumptions about liquefaction hazards may result in liquefaction assessment that is not adequate to ensure public safety. The DEIS states "Areas along the proposed pipeline that are subject to being under water-saturated soils within the pipeline depth…" which implies that there is no concern about liquefaction occurring below the depth of the pipeline trench. Lateral	Liquefaction potential should be evaluated for the entire susceptible section where ever the alignment crosses susceptible soils.

	spreading resulting from liquefaction at depths below the pipeline trench could pose a serious threat to the pipeline even if the soil surrounding the pipeline itself was not liquefied. The issue of inadequate liquefaction hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 2, 12, 13, 26) and has still not been adequately addressed.	
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-16	DOGAMI concludes that inadequately evaluated or referenced liquefaction evaluations are not adequate to ensure public safety. Table 4.1.2.3-2 lists river or stream crossings with potential liquefaction/lateral spreading hazards but no references or supporting borehole, geotechnical or geologic data for the sites are provided. It is not possible to determine whether the liquefaction potential assessments are adequate in the absence of such data. The issue of inadequate liquefaction hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 2, 12, 13, 26, 28, 29) and has still not been adequately addressed.	Provide a detailed, accurate and comprehensive liquefaction hazard analysis and mitigation design with supporting data. The assessment must be prepared by a qualified and licensed professional. For site specific liquefaction and liquefaction consequences evaluations, DOGAMI considers methods outlined in the following as state-of-practice: National Academies of Sciences, Engineering, and Medicine. 2016. *State of the Art and Practice in the Assessment of Earthquake-Induced Soil Liquefaction and Its Consequences*. Washington, DC: The National Academies Press. https://doi.org/10.17226/23474. https://www.nap.edu/catalog/23474/state-of-the-art-and-practice-in-the-assessment-of-earthquake-induced-soil-liquefaction-and-its-consequences
Section 4.13.1.5 FERC Engineering and Technical Review	DOGAMI concludes that the evaluation of potentially active faults near the terminal facility is inaccurate and incomplete and may not ensure public safety. The discussion of the Barview Fault misstates the age of the youngest features	Conduct seismic hazard analyses that include paleoseismic studies of potentially active faults

of the Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-735	offset by the fault by millions of years. The DEIS also ignores the Charleston Fault, which offsets Quaternary surfaces 19 m and whose northward projection offshore passes within a few km of the terminal site. The DEIS also makes no note of paleoseismic data that suggests quaternary offset across a buried fault in Pony Slough, immediately south of the terminal site. (Briggs, 1994 PSU Thesis https://pdxscholar.library.pdx.edu/open_access_etds/4739/) The issue of inadequate fault hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 23, 24, 25) and has still not been adequately addressed.	that might impact the proposed facilities. Evaluate the potential presence of buried extensions of the Charleston fault or Pony Slough fault near the site. The assessment must be prepared by a qualified and licensed professional.
Section 4.13.1.5 FERC Engineering and Technical Review of the Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-735	DOGAMI is concerned that the apparent lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS twice mentions “Affection faulting” or “affecting faulting” which are not terms in use in seismic hazard assessment.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for terminal facilities using accurate and up to date methods and data.
Section 4.13.1.5 FERC Engineering and Technical Review of the Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-737	DOGAMI is concerned that the DEIS does not mention certain critical ground motion parameters that are essential for a design that will ensure public safety. For large magnitude Cascadia Subduction Zone earthquakes, the duration of shaking can be in the range of 3-5 minutes, which has a huge impact on the performance of structures and soils. The DEIS has no discussion of this problem. This issue was raised in the DOGAMI November 6, 2017 review memo (comment 1) and has still not been adequately addressed.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for terminal facilities using accurate and up to date methods and data and addressing all relevant ground motion parameters including duration of shaking.
Section 4.13.1.5 FERC Engineering and Technical Review of the Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-738	DOGAMI is concerned that the apparent lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS includes a long discussion of the correlation between PGA, Mercalli Intensity and Richter magnitude. This has no relevance to a modern seismic hazard assessment for a project of this scale and importance and calls into question the credibility of this section of the report. Probabilistic spectral ground motion parameters are the standard of practice for evaluating and designing this kind of facility.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.

Section 4.13.1.5 FERC Engineering and Technical Review of the Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-739	DOGAMI is concerned that the cursory treatment of liquefaction hazards at the JCEP terminal site is not adequate to ensure public safety. Liquefiable soils have been identified throughout the site, and CSZ M 8-9 earthquake ground motions will certainly be large enough to trigger liquefaction. The DEIS appears to leave the management of this known and great hazard to future design work. Liquefaction, along with tsunami inundation and earthquake induced landslides are among the greatest threats to the project's integrity and safety, and all should be rigorously evaluated and have detailed mitigation measures developed prior to approval. The inadequate treatment of this severe acknowledged hazard in the DEIS is completely inconsistent with the risk it poses to the public safety and the scale of mitigation required. The issue of inadequate liquefaction hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 2, 12, 13, 26) and has still not been adequately addressed.	Provide a detailed, accurate and comprehensive liquefaction hazard analysis and mitigation design with supporting data. The assessment must be prepared by a qualified and licensed professional.
DEIS page 1-22 Table 1.5.1-1	The Applicant suggests "Review of Structural Designs in Tsunami Zone" is within DOGAMI's purview, which is incorrect.	Based on Building Code Division requirements, the Applicant may be required to consult with DOGAMI "for assistance in determining the impact of possible tsunamis on the proposed development and for assistance in preparing methods to mitigate risk at the site of a potential tsunami."
DEIS page 1-22 Table 1.5.1-1	The DEIS incorrectly refers to Building Code Section 1802.1 for DOGAMI's authority on "Review of Structural Designs in the Tsunami Zone" (which as noted in the above comment is incorrect). Building Code Section 1802.1 includes definitions.	Cite correct Building Code Sections and refer to the correct authorities. Based on Building Code Division requirements, the Applicant may be required to consult with DOGAMI "for assistance in determining the impact of possible tsunamis on the proposed development and for assistance in preparing methods to mitigate risk at the site of a potential tsunami."
DEIS page 4-739	"Jordan Cove conducted hydrodynamic and tsunami	Provide a detailed

	modeling studies for the Project site and indicated a tsunami generated by a megathrust earthquake on the CSZ would present the greatest tsunami inundation risk at the project site and the maximum design tsunami run-up elevation for the project site is no greater than 34.5 feet NAVD 88 including co-seismic subsidence and sea level rise effects."	tsunami hazard analyses prepared by a qualified professional for the proposed facilities and its surroundings. Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Explicitly specify in the DEIS report, which earthquake scenario (L1, XL1, XXL1 or ASCE7) was used for modeling the runup elevation. Per reports +34.5 ft navd88 corresponds to the L1 model scenario.
DEIS page 4-739	"For the Project site and in accordance with more recent tsunami modeling completed for the Southern Oregon Coast (Witter et al. 2011), the estimated subsidence would be on the order of 7.6 feet."	Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Explicitly specify in the DEIS report, that the referenced subsidence is associated with an L1 earthquake scenario.
DEIS page 4-739	"Jordan Cove also indicated that furthermore tsunami protection berms, safety critical elements of the facility, point of support elevations, invert levels and underside of essential equipment, would be at least 1 foot above the estimated maximum run-up elevation and most will be far above that elevation."	Explicitly specify in the DEIS report, which earthquake scenario (L1, XL1, XXL1 or ASCE7) is being referenced here.
2.11.1-JCEP-Final-RR11, p56	"A distant earthquake in Alaska or Japan could result in a tsunami with a relatively long lead-time (12 to 24 hours) before reaching the Oregon coast."	Provide a detailed tsunami hazard analyses, including distant tsunami hazards, prepared by a qualified professional for the proposed facilities and its surroundings. The results should be integrated into tsunami safety plans.

		DOGAMI estimates that an Eastern Aleutian generated tsunami is expected to arrive on the Oregon coast in 3 hours 40 minutes to about 4 hours (Allan et al 2018). Conversely, a Japanese tsunami is expected to arrive on the Oregon coast in as little as 9 hours 40 mins (Allan et al. 2012)
2.11.1-JCEP-Final-RR11, p56	"All ships in Coos Bay, including an LNG carrier, would be directed to depart the harbor by the USCG COTP. LNG carriers at the LNG Terminal will be facing the basin entrance and Coos Bay and would be adequately manned, as required by the USCG, with the ability to get underway in a short time period while berthed. Therefore, the LNG carriers would be able to depart relatively quickly from the LNG Terminal and head out to sea in the event of a distant tsunami, in response to notice and instructions from the USCG COTP."	An evaluation of the time taken to mobilize a vessel and get underway should be described in more detail. Typical large vessel mobilization generally takes at minimum 30 minutes, though times closer to 1 hour are more common (Allan et al, 2018). Consideration should therefore be given to vessel mobilization time, and the time taken to transit along the navigation channel and offshore into deep water prior to the arrival of the tsunamis. For example, a vessel traveling at 12 knots along the 7 mile navigation channel from the JCEP site, will take ~30 minutes to reach the mouth of Coos Bay.
2.11.1-JCEP-Final-RR11, p56	"It is established that it would take approximately 25 to 30 minutes for a large tsunami generated from the CSZ to reach Coos Bay after the earthquake event occurs."	Provide a detailed tsunami hazard analyses, including Cascadia tsunami arrival times, prepared by a qualified professional for the proposed facilities and its surroundings. DOGAMI's analyses indicate that the

		local tsunami arrives @ 24 minutes at the JCEP site. Maximum inundation occurs at 31 minutes.
2.11.1-JCEP-Final-RR11, p56	"This amount of time would be adequate for the terminal to stop loading operations and disconnect from the LNG vessel and use two tug boats already in the slip to counteract the forces placed on the LNG carrier hull by the arriving tsunami."	Bear in mind that the region would be subject to 3-5 minutes of strong shaking, when normal operations would be severely challenged. Hence, this statement seems optimistic at best. Does the presence of the two tugs in the slip mean that these vessels would already be underway?
2.11.1-JCEP-Final-RR11.pdf, p56	"If the LNG carrier is traversing the channel during the tsunami, the tugs would also provide assistance against the force of the tsunami wave coming up the channel as described above."	This statement seems optimistic at best. Recommend JCEP re-evaluates their vessel emergency response plan to a local tsunami.
2.13.1-JCEP-RR13-Public-1-of-7-1.pdf, p64	"A uniform roughness was used for these simulations."	Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Please specify the roughness used.
2.13.3-JCEP-RR13-Public-3a-of-7-2.pdf, p7	"To assess the effect of roughness, M&N simulated Scenario L1 with a composite roughness map where areas below 0.0 MSL (pre-event conditions) have a roughness defined by a Manning number of 0.0313 representing channel conditions and areas above 0.0 MSL (pre-event conditions) have a higher roughness defined by a Manning number of 0.05."	Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Please justify choice of roughness criterion (n=0.05) adopted for areas above 0.0 MSL, versus n=0.0313 used for the seabed.
2.13.3-JCEP-RR13-Public-3a-of-7-2.pdf, p15	"According to a study published by the U.S. Geological Survey in 2008, there is a 10% probability that a CSZ earthquake of magnitude 8–9 will occur over the next 30 years (DOGAMI, 2012)."	USGS (2012) estimated a full margin rupture at 7-12% next 50 years; 37-42% for southern Oregon.

		Goldfinger (2017) revised downward (i.e. more frequent) the recurrence of CSZ earthquakes for the central northern Oregon coast to ~340 years. He estimates that the conditional probability of a major event taking place is 16-22 % chance in the next 50 years.
2.13.3-JCEP-RR13-Public-3a-of-7-2.pdf, p29 to33	"As it can be seen from the figures, the comparison shows a very good agreement between the two models for surface elevation and flow velocities of the leading wave as well as time of tsunami arrival at all stations."	We agree, though note that there are significant phase differences in the tsunami time series after the initial wave arrives. Please explain these discrepancies.
2.13.3-JCEP-RR13-Public-3a-of-7-2.pdf, p34	"Based on the comparison of model results presented in Section 4.0 between M&N and DOGAMI, the simulation used uniform roughness defined by a Manning number of 0.0313 and uniform eddy viscosity defined by a Smagorinsky coefficient of 0.28"	This is confusing. Do you mean another suite of modeling was performed where a uniform surface roughness was used that equaled 0.0313? Please clarify with respect to a previous comment noted above on surface roughness.
2.13.5-JCEP-RR13-Public-4-of-7.pdf, p10	"According to a study published by the U.S. Geological Survey in 2008, there is a 10% probability that a CSZ earthquake of magnitude 8–9 will occur over the next 30 years (DOGAMI, 2012)."	USGS (2012) estimated a full margin rupture at 7-12% next 50 years; 37-42% for southern Oregon. Goldfinger (2017) revised downward (i.e. more frequent) the recurrence of CSZ earthquakes for the central northern Oregon coast to ~340 years. He estimates that the conditional probability of a major event taking place is 16-22 % chance in the next

		50 years.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	How the proposed facilities may negatively impact the tsunami hazards in the surrounding areas and safety of people;	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #3) and has still not been adequately addressed. What are the impacts to the surrounding area? What are the tsunami evacuation plans during construction? What are the tsunami evacuation plans during operations? What are negative impacts to the people in the surrounding area and revised evacuation plans for those areas?
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Tsunami scour in the nearby area and how the Maximum Considered Tsunami (MCT), that is, the design tsunami, may impact the local landforms, including the dunes, and proposed facilities and safety of people;	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #4) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas	Dynamic erosion of the North Spit dunes in response to the design tsunami and how it may impact tsunami runup at the proposed facilities and safety of people;	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #5) and has still not been adequately addressed.

Pipeline.		
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Tsunami debris impacting the nearby area and how it may impact the local landforms, including the dunes, proposed facilities and safety of people;	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #6) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Section 6.4.1.4 Tsunamis of the Resource Report 6 Jordan Cove Energy Project refers to the existing Trans Pacific Parkway/US- 101 Intersection as being in the tsunami inundation zone. The Applicant states, "To maintain grades, improvements to the intersection will not remove the intersection from the tsunami inundation zone." There appears to be only one access road for the proposed Jordan Cove LNG facility. This access road is in the tsunami inundation zone. In order for the access road to be reliably useable for safety purposes after a future tsunami disaster, it would need to incorporate both earthquake and tsunami resistant designs. These designs would need to factor in potential cyclic strain, liquefaction and lateral spreading from ground shaking. In addition, the designs would need to account for tsunami forces, including flooding, velocities, scour, buoyancy and debris impact. Has this roadway and access to the proposed facilities been evaluated for possible damage due to tsunami forces, such as tsunami scour and tsunami debris impact? Please provide analyses, results and, if needed, proposed mitigation that addresses both post-earthquake and post-tsunami safety for proposed berms, roadways and elevated ground. Related documents should be complete, clearly organized and presented to allow for peer review by qualified specialists.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #15) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological	The Applicant states (on page 8): "The PCGP Project is located in relatively sheltered areas of Coos Bay, where the effects of a tsunami on the pipeline are expected to be relatively minor". DOGAMI requests the tsunami analyses that supports this statement. What tsunami modeling was conducted for the proposed pipeline alignment? What are the tsunami flow depths used to estimate scour potential? Were tsunami scouring forces evaluated for both the	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #18) and has still not been adequately addressed.

Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	incoming (inflow) and outgoing (outflow) tsunami waves?	
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	The Applicant states (on page 46): "As currently planned the portions of the pipeline that are crossing waterbodies that have the potential to be impacted by tsunami scour, will be installed using trenchless methods at depths well below the potential scour depths. Therefore, tsunami scour is not considered a hazard to the pipeline project." The Applicant further states, "The modeling analysis showed that some temporary scour may occur in Coos Bay along the pipeline during inundation of the tsunami (approximately 1 to 2 hours)." The Applicant indicates that scour from tidal currents and river flows are approximately 3 feet at the pipeline crossing, and "it is recommended to use a 3-foot depth of scour resulting from tsunami impact". DOGAMI requests the Applicant provide information on maximum potential scour depth from a Cascadia tsunami. Also, DOGAMI requests information on the minimum factor of safety the Applicant applied to address the maximum potential scour depth from Cascadia tsunamis along the proposed alignment in greater Coos Bay area.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #38) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	The Applicant, in general, found that their MIKE21 modeling matched the DOGAMI L1 first wave arrival (which reflects the largest wave), although wave amplitudes and phase differences were observed for later wave arrivals. No explanation is provided to account for the latter differences. DOGAMI requests further discussion of differences in the modeling results after the initial wave arrival to account for phase and amplitude differences observed in the modeling results.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #39) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to	DOGAMI requests that the Applicant provide peer reviewed documentation that describes the MIKE21 FM model and its ability to model tsunami inundation. Many issues are unclear, for example, does MIKE21 adequately account for the (vertical) wave runup on the wall and/or composite structure?	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #40) and has still not been adequately addressed.

Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.		
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant provide further explanation of the approach used to define the digital elevation model (DEM). In particular, how does the developed grid differ from the tsunami grids generated by NOAA's National Center for Environmental Information (NCEI). These data may be obtained here: https://www.ngdc.noaa.gov/mgg/inundation/tsunami/.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #41) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant explain to what extent has the model been tuned to match the DOGAMI L1 scenario and inundation results.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #42) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan	DOGAMI requests that the Applicant provide a better depiction of the three cases used to define the design crests. It is unclear whether the design reflects a berm, wall, or a composite structure around the perimeter of the entire complex, or portions of the complex. Please provide figures that characterize the proposed design.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #43) and has still not been adequately addressed.

Cove LNG Terminal and Pacific Connector Gas Pipeline.		
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant explain why mean high water (MHW) was used as opposed to MHHW (as used by DOGAMI).	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #44) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Values of future sea level rise (SLR) presented by the Applicant are based on existing (historical) trends derived for the Charleston tide gauge. Based on its current rate, estimates were made out into the future (i.e. 30 years). This is an overly simplistic approach that assumes the past is the key to the future and hence discounts possible acceleration of SLR in the future. A more effective approach would be to base future estimates on the National Research Council (2012) SLR study that was completed for the US West Coast. National Research Council estimates account for expected local tectonic changes as well eustatic and steric responses and are a more reasonable (and current) estimates for the future. Please address SLR using current scientific data and methods.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #45) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific	Provide analysis of the potential role of sediment erosion of the North Spit dunes caused by the design tsunami. Research on the US East Coast suggests that sediment erosion during a tsunami may be significant and could impact inundation extents and runup (Tehranirad et al., 2015, 2016; Tehranirad, 2016). This notion is also supported by field studies following the March 11, 2011 Tohoku, Japan tsunami (Goto et al., 2012; Tanaka et al., 2012).	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #46) and has still not been adequately addressed.

Connector Gas Pipeline.		
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Provide analyses of the potential role of tsunami wave reflection/focusing/defocusing as the tsunami impacts the proposed LNG facilities and its possible public safety implications for the surrounding Coos Bay environment. Tsunami waves that impact against proposed protective structures (e.g., berm, wall or composite structure) and the subsequent transfer of that energy to other areas within the bay is a public safety concern. DOGAMI requests additional modeling for the purposes of addressing public safety. All documents should be complete, clearly organized and presented to allow for peer review by qualified specialists.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #47) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant provide analysis of maritime vessels and their potential to become ballistics within the bay be submitted to Oregon Department of Energy as part of the Emergency Response Plan. Maritime evacuation planning in response to the tsunami should be conducted and provided.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #48) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant provide analysis on the potential for off-site debris impacting the facilities and the potential ramifications with respect to public safety.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #49) and has still not been adequately addressed.
DOGAMI memo	DOGAMI requests that the Applicant provide information on	This issue was raised in

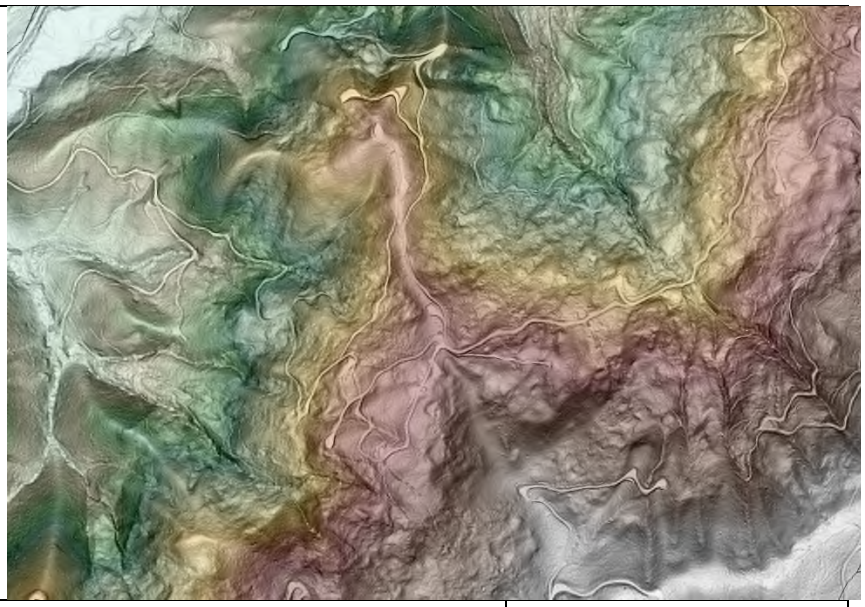
dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	each of the DEMs used for the tsunami model. For example, were three different DEMs used that reflect the three different case studies: berm, wall and composite structure? Please provide the DEMs.	the DOGAMI November 6, 2017 review memo (comment #50) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Elevated structures, including elevated berms, used for assembly areas in the tsunami inundation zone are subject to ASCE 7-16 chapter 6 requirements. The Applicant must design all elevated structures in the ASCE tsunami zone to be used as assembly areas in accordance with ASCE 7-16 chapter 6 to ensure public safety. Design documents should be complete, clearly organized and presented to allow for peer review by qualified specialists.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #51) and has still not been adequately addressed.
PCGP RR6 App A.6 Part 1, section 4.5.3.2, page 30	The applicant states it used ODF guidelines and DOGAMI RML hazard zones.	Provide a detailed landslide hazard analyses prepared by a qualified professional using current state of practice methods that include lidar as a base map for the proposed facilities and its surroundings. Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Both the DOGAMI RML and ODF RML methods are for preliminary screening and/or used outdated data sources.

DEIS, p4-18	"Mass-movement of rapid-shallow landslides is typically triggered by large, infrequent storm events."	"infrequent" is a relative term. Define and reference this conclusion. There is data in SLIDO which confirms shallow landslides in the Tyee occurring within basins on the 5-10 year time frame.
DEIS, p 4-18	"These features can usually be identified on topographic maps or aerial photos based on distinctive contour or vegetative patterns."	Lidar has been concluded to be the only definitive method for finding deep slides in western Oregon. Restate the sentence or provide modern reference to support this conclusion or complete mapping using lidar along the entire length of the route. Burns, W. J., 2007, Comparison of remote sensing datasets for the establishment of a landslide mapping protocol in Oregon. AEG Special Publication 23: Vail, Colo., Conference Presentations, 1st North American Landslide Conference.
DEIS, p 4-19	"Shallow-rapid landslides are unlikely to induce long-term strain to a pipeline, but rather more likely to expose the pipe and result in a loss of support where it crosses a debris slide source area."	This is completely site dependent. If the pipe is at the surface, a shallow slide could run into the pipe. Define the situations where this occurs.
DEIS p 4-19	"The purpose of the first phase study was to identify existing landslides as well as areas susceptible to landslides within one-quarter mile of the initial alignment by reviewing published maps and digital data (Burns et al. 2011a, 2011b), aerial photographs and LiDAR-generated hillshade models. The purpose of following two phases was to further evaluate only those landslide hazard sites that represent potentially moderate or high risk to the pipeline, based on the results of the previous phase of evaluation."	SLIDO is a compilation of published data and ranges from very poor older data from decades ago to the best available modern lidar based data. We don't recommend using it to make decisions about where to look

		further and in more detail. Site specific evaluations should be completed using lidar data in order to complete phase 1 correctly and completely.
DEIS p 4-20	"The intent was to identify areas that have some potential to be affected by RMLs so that they would be considered and evaluated appropriately."	Potential Rapidly Moving Landslide Hazards in Western Oregon (Hofmeister et al. 2002) is a preliminary screening tool and based on outdated datasets. Site specific evaluations including modern methods should be completed using lidar data in order to evaluate areas that have potential for shallow landslides.
DEIS p 4-20	"Based on available topographic mapping, no slopes along the pipeline alignment east of MP 166 exceed 65 percent or appear to be at high risk of rapidly moving landslide occurrence."	Conclusions should be supported by modern references. Site specific evaluations should be completed using lidar data to evaluate areas that have potential for shallow landslides.
DEIS p 4-20	"Using LiDAR where available, 10-meter digital elevation model, and aerial photography, Pacific Connector identified moderate and high risk RML sites along the proposed route."	Site specific evaluations should be completed using lidar data to evaluate areas that have potential for shallow landslides.
DEIS p 4-20	"Larger, deep-seated landslides can usually be identified from topographic maps (including LiDAR) and aerial photographs."	Lidar has been concluded to be the only definitive method for finding deep slides in western Oregon. Site specific evaluations should be completed using lidar data to evaluate areas that have potential for shallow landslides. Burns, W. J., 2007,

		Comparison of remote sensing datasets for the establishment of a landslide mapping protocol in Oregon. AEG Special Publication 23: Vail, Colo., Conference Presentations, 1st North American Landslide Conference.
DEIS p 4-21	"the Klamath Falls region (with relatively recent events of magnitudes 5.9 and 6.0) and the Coos Bay region (with the potential for very large, long recurrence interval, Cascadia megathrust events)."	USGS Cascadia ground motion maps predict the effects of a Cascadia will be much further inland that just the Coos Bay region. The entire pipeline route is in a high seismic zone. Revise the sentence to reflect current science on earthquake hazards.
DEIS p 4-21	"Six landslides were identified as posing a moderate to high potential risk and were evaluated further in the field."	This number of landslides is very low compared to what has been recently mapped in areas just north of the pipeline route using lidar based mapping. Lidar has been concluded to be the only definitive method for finding deep slides in western Oregon. We recommend the applicant use lidar data to map the landslides. Burns, W.J., Duplantis, S., Jones, C.B., and English, J.T., 2012. Lidar data and Landslide Inventory Maps of the North Fork Siuslaw River and Big Elk Creek Watersheds, Lane, Lincoln, and Benton Counties: Oregon Department of Geology and Mineral Industries, Open-File Report O-12-

			07. http://www.oregongeology.org/pubs/ofr/p-O-12-07.htm Burns, W.J., Herinckx, H.H., and Lindsey, K.O., 2017. Landslide inventory of portions of northwest Douglas County, Oregon, Oregon Department of Geology and Mineral Industries, Open-File Report O-17-04. Esri geodatabase with internal metadata, external metadata in .xml format, 4 map plates (in both print and onscreen resolutions), scale 1:20,000. http://www.oregongeology.org/pubs/ofr/p-O-17-04.htm
DEIS p 4-21	"Ridgetops are generally considered to be stable"		Provide a modern reference for this statement. Recent mapping in the coast range has found landslides propagating to and over the ridges. See references in above comment.
DEIS p 4-22	"All of the moderate- and high-hazard deep-seated landslides identified along the alignment were avoided"	If lidar and site-specific landslide hazard mapping was not performed to locate these areas, there are likely many areas missed and therefore not "all" are identified or avoided. An example can be seen in the following lidar image of the route from MP89-90. The PCGP mapping in Appendix F identified one landslide on the NE side of the route ridge. However, as a qualified professional can see in the lidar image, landslides are located along both sides of the ridge and on the slope down to the valley towards the NW.	

		
DEIS p 4-22	"All known hazardous landslides thought to pose a risk to the pipeline have been avoided through routing."	If lidar and site-specific landslide hazard mapping was not performed to locate the hazardous areas, there are likely many hazards missed and therefore not "all" have been identified or avoided.
DEIS p-4-22	"Following Pacific Connector's proposed BMPs described in the ECRP would limit potential adverse impacts on slope stability for those side slopes segments that are less than 30 percent gradient. In general, these BMPs include using well-drained structural fill placed in lifts and compacted for the side slope sites with gradients of 30 percent or greater oriented perpendicular to the pipeline."	Using slope gradient alone does not work in areas of existing landslides. Many deep landslides are on slopes with very low gradients. A critical component is identifying where the existing landslides and hazards are located and addressing each one individually regardless of slope gradient. Even small amounts of grading on existing landslides can cause significant problems.
DEIS p 4-23	"Monitoring higher-risk areas along the pipeline can aid in detecting landslide occurrence and movement so that action can be taken to prevent damage to the pipeline."	This method only applies to very limited group of types of landslides and triggering types. For example, during a future

		Cascadia earthquake, it will be very difficult to monitor, detect movement and take action before the co-seismic landslides have already moved and damaged the pipeline.
DEIS p 4-24	"Although the pipeline route does not cross active or recently active landslides, if any landslides do occur or become reactivated after the pipeline is installed, Pacific Connector would monitor the slide movement so that mitigation can be identified and implemented prior to damage occurring to the pipeline."	This unsubstantiated conclusion needs analyses and data to support it. For example, collecting lidar for the entire route and mapping all the existing landslides and evaluating them.
PCGP RR6 App A.6 part 1, page 28	"Some of the Pipeline route adjustments intended to avoid identified hazards, as well as land acquisition issues, resulted in route alignments that extended outside the area of LiDAR coverage. Supplemental LiDAR and aerial photograph data were acquired for many of these localized reroute areas. Nevertheless, some of the later reroute alignments are currently outside the area of LiDAR and aerial photograph coverage."	DOGAMI recommends the Applicant obtain high resolution lidar for all areas that may impact the proposed facilities or pipeline along the proposed route. Lidar coverage should be collected with enough buffer distance to characterize potential seismic and landslide hazards. For example, for landslide hazards, the lidar should include from the valley bottom to the top of the ridge. Also, there is publicly available lidar data along most all of the pipeline route as well as statewide aerial photography. Please evaluate the potential large landslides keeping in mind that landslides may extend from the tops of ridges and may move downslope to block rivers. In addition, lidar should be used to evaluate seismic sources. The issue of inadequate

		landslide hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comment #35) and has still not been adequately addressed.
PCGP RR6-AppA.6-part 1, p28	"However, most landslides can be placed in two general categories: (1) shallow-rapid landslides (debris slides/flows); and (2) deep-seated landslides."	Provide a comprehensive, detailed landslide hazard analyses prepared by a qualified professional for the proposed facilities and its surroundings. Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Co-seismic lateral spreads are an important type of landslide which could affect the facility and pipeline.
PCGP RR6-AppA.6-part 1, p29	"generally greater than 50 percent"	Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Provide references for all numbers.
PCGP RR6-AppA.6-part 1, p29	"DOGAMI, in cooperation with other agencies, produced a map of Potential Rapidly Moving Landslide Hazards in Western Oregon (Hofmeister et al., 2002)."	This map is considered for preliminary screening and was created before lidar data became widely available. Site-specific evaluation of RML should be performed by the consultants using lidar data and modern methods. The issue of inadequate landslide hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comment #37) and has still not been adequately addressed.
PCGP RR6-	"The source, transport and depositional zones comprising	This map (DOGAMI IMS-

AppA.6-part 1, p30	the RML hazard areas were not differentiated on the maps/GIS data provided by DOGAMI."	22) is considered for preliminary screening and was created before lidar data became widely available. It is also not intended to make site-specific decisions. In this example, the IMS-22 data appears to be further misused to make non-site-specific evaluations. Site-specific evaluation of RML should be performed by the consultants using lidar data and modern methods. The issue of inadequate landslide hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comment #36) and has still not been adequately addressed.
PCGP RR6-AppA.6-part 1, p31	"The initial relative risk to the Pipeline posed by the source, transport and depositional zones are considered to be high, moderate and low, respectively."	Provide a reference or documentation for this unsubstantiated conclusion. Debris flow depositional areas can be extremely dangerous and impactful depending on the size of the event. Concluding the risk is "low" for these areas needs substantial support from referenceable scientific studies.
PCGP RR6-AppA.6-part 1, p32	The greatest potential for reactivating large, deep-seated landslide movement is from human activity, seismic activity, stream erosion, and/or above-normal precipitation that extends over several months or years.	Provide a reference or documentation for this unsubstantiated conclusion.
PCGP RR6-AppA.6-part 1, p32	"The Pipeline is located within 1,000 feet and is upslope or downslope of the landslide"	Provide a reference or documentation for the unsubstantiated conclusion that 1,000 ft is far enough up or downslope to examine. Landslides should be

		evaluated to the extent for which they could impact the pipeline.
PCGP RR6-AppA.6-part 1, p33	"Surficial, geomorphic and vegetative features suggest that the landslide is active or dormant-historic (past movement less than 100 years ago) (Keaton and Degraff, 1996)."	Landslide age should not be used to determine hazard or risk.
PCGP RR6-AppA.6-part 1, p33	"Alignment is at a proximity that is sufficiently far from the landslide"	Provide a reference or documentation for the unsubstantiated conclusion that "sufficiently far" is far enough for the pipeline to be safe.
PCGP RR6-AppA.6-part 1, p34	During this phase, routing specialists were consulted to identify potential alternative routes around moderate to high risk landslides that appeared to be active or to have the potential to reactivate.	Analysis of risk should be quantitative using acceptable state-of-practice methods. For example, "landslides that appeared to be active or have potential to reactivate" is very vague and not conclusive.
PCGP RR6-AppA.6-part 1, p34	4.6. Landslide Hazard Avoidance and Minimization of Adverse Effects	If lidar and site-specific landslide hazard mapping was not performed to locate these areas, there are likely many areas missed and therefore not "all" are identified or avoided.
PCGP RR6-AppA.6-part 1, p35	"To ensure long term stability, it is important that fill slopes constructed at gradients of 30 percent or greater be engineered."	A simple slope gradient is not sufficient to identify where engineered cuts and fills should be performed. For example, many deep landslides have slopes much less than 30 percent.
PCGP RR6-AppA.6-part 1, p35	"Perforated drains should be surrounded by 12 inches of drain rock and all of which wrapped in a geotextile filter fabric."	If water is being collected at the surface or subsurface, a plan for where the water will be discharged is critical. Provide a water plan including collection and discharge. Discharging water in a non-designed

		method can cause slope instability. Using lidar to map all the existing landslides along the entire length of the pipeline route on both sides of the route all the way to the ridge top or all the way to the valley bottom is the only way to ensure discharging of water will not increase slope instability.
PCGP RR6-AppA.6-part 1, p35	4.6.2.1. SURFACE AND NEAR SURFACE WATER MANAGEMENT	If water is being collected at the surface or subsurface, a plan for where the water will be discharged is critical. Provide a water plan including collection and discharge. Discharging water in a non-designed method can cause slope instability. Using lidar to map all the existing landslides along the entire length of the pipeline route on both sides of the route all the way to the ridge top or all the way to the valley bottom is the acceptable way to help ensure discharging of water will not increase slope instability.
PCGP RR6-AppA.6-part 1, p37	"During Pipeline construction, qualified professionals with experience in slope stability will observe Pipeline construction within the identified landslides. If indications of instability are observed, necessary mitigative actions will be taken."	Pre-construction, construction, and post-construction stability analysis should be performed before the project is started so that potential adverse effects can be identified and mitigation prior to construction.
PCGP RR6-AppA.6-part 1,	The proposed PCGP Pipeline does not cross known active or recently active landslides that require installation of	If lidar and site-specific landslide hazard mapping

p37	instrumentation. The ancient landslides crossed by the proposed PCGP Pipeline alignment will be monitored as part of the system-wide monitoring conducted by PCGP.	was not performed to locate these areas, there are likely many areas missed and therefore not "all" hazards have been identified nor avoided. Provide a detailed landslide hazard analyses prepared by a qualified professional using current state of practice methods that include lidar as a base map for the proposed facilities and its surroundings. Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Dependencies on existing infrastructure, such as roads and levees, which may fail during disasters causing safety concerns;	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #7) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and	On the basis of Oregon Administrative Rules per Division 21, OAR 345-021-0010(1)(h)(F)(i-ii), which states: "(i) An explanation of how the applicant will design, engineer, construct and operate the facility to integrate disaster resilience design to ensure recovery of operations after major disasters. (ii) An assessment of future climate conditions for the expected life span of the proposed facility and the potential impacts of those conditions on the proposed facility" (Accessed from: https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=234447), DOGAMI encourages designing and	This issue was raised in the DOGAMI November 6, 2017 review memo and has not been adequately addressed.

Pacific Connector Gas Pipeline.	building for ***disaster resilience*** and ***future climate*** using science, data and community wisdom to protect against and adapt to risks. This will allow people, communities and systems to be better prepared to withstand catastrophic events and future climate—both natural and human-caused—and be able to bounce back more quickly and emerge stronger from shocks and stresses. This includes: • Using best practices supporting public safety • Using a long-term view to protect citizens, property, environment, and our standard of living • Integrating resilience, where possible, by avoiding high risk areas or embracing higher performance standards than may be required by building codes and regulations. This will lessen damage and speed recovery after disasters and improve continuity of operations.	

Oregon Department of Land Conservation and Development

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DLCD is Oregon's designated coastal management agency statutorily responsible for acting on the required certification of consistency with the Oregon Coastal Management Program (OCMP) pursuant to Section 307 (c)(3)(A) of the Coastal Zone Management Act (CZMA). An applicant for any federally-permitted project must obtain a CZMA consistency concurrence for the federal permit or license to be valid in Oregon's coastal zone.

These comments focus on the deficiencies of the Draft Environmental Impact Statement (DEIS) as guided by the implementing regulations for NEPA documents at 40 CFR Part 1502 and 18 CFR Part 380. DLCD submits these comments with the perspective that deficiencies in DEIS information, regarding the assessment (or lack thereof) of impacts and the resulting mitigation from the assessed impacts, affects the federal consistency review process. DLCD uses NEPA documents, like the Federal Energy Regulatory Commission's (FERCs) DEIS, to evaluate the coastal effects of a proposed project per the federal consistency regulations at 15 CFR Part 930. A CZMA coastal effects evaluation includes reasonably foreseeable effects to natural resources and cultural resources, as well as impacts to economics, aesthetics, and recreation reliant on coastal resources. Comments we submitted during the Notice of Intent (NOI) scoping period in 2017 emphasized the necessity of a robust and comprehensive DEIS in order to be able to conduct an adequate review to determine consistency of this federally-licensed and permitted project with the OCMP. Although other state agencies have identified issues that may apply to the entire project under their respective jurisdictions, for CZMA consistency review, DLCD focuses on our coastal partners' issues and concerns within Oregon's coastal zone. Detailed information for any coastal partner issue included below is provided in each state agency comment section. State agency comment sections may raise additional issues as well.

In the published NOI, FERC staff identified issues (pg 7-8) that merited attention and inclusion in the relevant sections of the DEIS (40 CFR § 1502.9). Additionally, Oregon state agencies identified additional issues, including those related to enforceable policies of Oregon's networked coastal program, in comments to the FERC on August 15, 2017. The DEIS should have thoroughly address those identified issues in order to provide an assessment of impacts and mitigation for impacts in Oregon's coastal zone. Table 1 lists the issues identified by FERC staff and state coastal partners of the OCMP, to what extent the issue was analyzed in the DEIS, what is missing from the FERC's analysis, and the relevance of the information and analysis to federal consistency review.

Table 1. Topics identified in Notice of Intent or in scoping period comments and remaining deficiencies in the DEIS with relationship to the CZMA federal consistency review process.

Issues	Source	Extent Analyzed in 2019 DEIS	Missing from 2019 DEIS	Relationship to CZMA Analysis
Reliability and safety of LNG carrier traffic and natural gas pipeline	Commission Staff in NOI	Section 4.10.1.1 Marine Traffic Section 4.13.1.3 Safety and Reliability focuses on collisions with LNG carriers. Conclusion Section 5.1.10: Increased marine traffic would be less than historic ship traffic and so no significant impact to other marine traffic.	--Safety of other commercial and recreation vessels, aside from collisions with LNG carriers (*i.e*. increased wait times to enter Coos Bay in changing weather conditions because of LNG carrier security zone) --Time of year 70 construction vessels or 120 LNG carriers will be present. If all year, how will vessels safely navigate winter weather conditions or location of anchorage if within Territorial Sea if not able to enter bay. --Locations where marine traffic can wait safely in bay while LNG carrier passes. See Figure 1 based on a carrier 50 yards wide. --No discussion regarding what maximum size carrier the bay can accommodate safely.	Coastal effects evaluation for local coastal economies.
Impacts to aquatic resources from dredging access channel and slip and pipeline crossings	Commission Staff in NOI	Section 4.3 Water Resources and Wetlands Section 4.6 T&E Species Appendix H: Lists temporary and permanent impacts Conclusion Section 5.1.3.1; 5.1.3.2; 5.1.3.3:	--Please see DEQ comments for detailed information for missing analysis regarding water quality. --Please see ODFW comments for detailed information on missing analysis regarding: --Fish, wildlife, and associated habitats; e.g. the deepwater draft slip; salinity intrusion from dredging; impacts to aquatic organisms; and other aquatic concerns. Lack of assessment of riparian and	Coastal effects evaluation for impacts to natural/cultural resources and related local coastal economies.

		No significant impacts	steep slope impacts of the pipeline project. --Mitigation for temporary impacts to aquatic resources is a concern. Applicant and DEIS have specified mitigation actions for permanent impacts, however, the DEIS does not identify the temporary impacts fully for both JCEP and PCGP or propose mitigation. (*i.e.* impacted wetlands on pipeline route may take 4+ years to recover ecological function from pipeline impacts). --Mitigation for temporally related habitat function impacts. --Without specified mitigation that is tailored to address fish and wildlife habitats/ecology, it is not possible to balance impacts with offsets and come to a conclusion regarding total environmental impacts for the project.	
Potential impacts on the LNG terminal resulting from an earthquake or tsunami	-Commission Staff in NOI -State of Oregon scoping period comments; DOGAMI comments August 15, 2017; pg 8	Section 4.1 Geological Resources Section 4.13 Reliability and Safety	-- Please see DOGAMI comments for detailed information regarding missing analyses including the following topics: -- Geologic hazards have not been comprehensively identified, addressed in the DEIS, nor mitigation proposed for impacts. -- Dependencies on existing infrastructure, such as roads and levees, which may fail during disasters causing public and environmental safety concerns have not been	Coastal effects evaluation for impacts to local coastal economies and natural/cultural resources.

			included. --Tsunami hazards analyses, including tsunami hazards with the proposed channel and estuarine modifications from related Port project, specifically how currents, debris and ballistics may negatively impact the surrounding areas and safety of people, have not been included. --An explanation of how the applicant will design, engineer, construct and operate the facility to integrate disaster resilience design to ensure recovery of operations after major disasters. --An assessment of future climate conditions for the expected life span of the proposed facility and the potential impacts of those conditions on the proposed facility -- ASCE 7-16 (issued 2016) design standards include tsunami requirements, while the older versions do not. No discussion regarding new tsunami requirements or why most recent standards were not used.	
Impacts of pipeline construction on federally listed threatened and endangered species including northern	Commission Staff in NOI State of Oregon scoping period comments; ODFW comments August 15,	Section 4.6 lists impacts to federally listed species throughout. May affect and likely to adversely affect 12 species. Section 4.7 lists	--Please see ODFW comments for detailed information regarding missing analyses. --The DEIS notes some mitigation (*i.e.* older stand management); however, without specific assessment of impacts in relation to mitigation it is difficult to balance effects and come to a	Coastal effects evaluation for impacts to natural/cultural resources and local coastal economies (salmon; recreational and commercial).

spotted owl, marbled murrelet, and salmon	2017; pg 15-34	total late successional (old) forest acres on BLM land. 159.19 acres, BLM Coos Bay District, Section 2.1.7 Non-federal land mitigation still in development. Section 5.1.6 states no mitigation has been proposed by applicant to date.	conclusion regarding total environmental impacts for the project.	
Impacts of pipeline construction to private landowners including the use of eminent domain	Commission Staff in NOI	Section 2.3.2 Statement of ability for Project to use the right of eminent domain	--Entire analysis of impacts of exercising eminent domain on landowners, livelihoods, land-associated businesses, and property values.	Coastal effects evaluation for impacts to coastal economies.
Cumulative effects from additional large-scale projects in Coos Bay; particularly related Channel Modification project.	State of Oregon scoping period comments; ODFW comments August 15, 2017; pg 15	Section 4.14: Statements acknowledge cumulative effects of the Port's Channel Modification throughout. Acknowledged project is likely to have the largest contribution to cumulative impacts on Coos Bay. (pg 4-794) Appendix N lists	--Please see ODFW comments for detailed information regarding missing analyses including: --Limited analysis of impacts and lack of quantification of mitigation to offset impacts including, but not limited to: cumulative cubic yards, cumulative duration of disturbance in the waterway, cumulative conversion of shallow to deep-water habitat, cumulative changes in water current, cumulative changes to natural and conservation estuary management units in	Coastal effects evaluation for impacts to natural/cultural resources and economics.

		total acres whether upland or aquatic) from all regional projects.	Bay, cumulative mitigation for permanent aquatic habitat changes including oyster, clam, shrimp, crab and other aquatic ecosystem-dependent economies. --Unable to locate Table 4.14.2.3-1 as reference in Section 5 (pg 5-11). Projects with largest estuarine impacts warrant deeper, quantifiable cumulative analysis.	
Impacts to non-listed species and upland habitats and associated mitigation for impacts.	State of Oregon scoping period comments; ODFW comments August 15, 2017; pg 28	Section 2.1.7 Non-federal land mitigation still in development. Section 4.6 briefly describes state listed species.	-- Please see ODFW comments for detailed information regarding missing analyses including the following: -- No analysis for state species of concern, habitats of concern, state protected wildlife, associated mitigation for species habitats via state's habitat mitigation policy.	Coastal effects evaluation for impacts to natural/cultural resources

Additional topics of concern that are not sufficiently addressed in the DEIS are in Table 2.

Table 2. Additional deficiencies of the DEIS identified by DLCD.

Topic	Sections/Pages	Missing from 2019 DEIS	Relationship to CZMA Analysis
Impacts of spatial restrictions of channel use to recreational and commercial fisheries. Please see Figure 1.	Section 4.8.1.1 JC Terminal Recreation and Visual Resources: Acknowledges impacts to crabbing/clamming, boating, and fishing because of LNG carrier security zone (pg 4-540-541) Section 4.9.1.7 Recreation/Tourism and 4.9.1.8 Commercial	Analysis regarding economic impacts from LNG carrier security zone requirements (*i.e.* missing preferred fishing times, tides, or other critical natural resource timing issues due to 2-3.5 hour delay (page 2-14) while LNG carrier is in navigation channel). The time estimation in Section 4.8 (pg 4-541) conflicts with information on pg 2-14 and also on pg 4-598 (20-30 minutes). Bar pilots guiding commercial ships report passing approx. 6 recreational boats (pg 4-541) and 2 commercial fisheries boats (pg 4-597) per trip. The width of carrier plus security zone (likely 500 yard radius around moving ship (pg	Coastal effects evaluation for impacts to local coastal economies from safety considerations and associated delays

	Fishing: Acknowledges impacts from LNG carrier security zone (4-596-598). Sections 5.1.8.1 and 5.1.9 Conclusion: No significant impacts commercial or recreational fisheries vessels or economies.	4-623)), is approximately ¾ of a mile (See Figure 1). No spatial analysis of security zone for LNG carrier including pinch points, safe waiting areas, vessel delays, and associated impacts to fisheries-dependent economies. The security requirements for LNG carriers are not similar to other deep-draft vessel use of the channel, warranting additional analysis.	
Impacts to regional resources and economy from global climate change due to additional atmospheric carbon inputs	Section 4.14: Cumulative Impacts Acknowledges broad impacts to nation from climate change. (pg 4-804-807).	Analysis does not include unique challenges to coastal region from: climate change and sea level rise, decreased income for natural resource-dependent economies, or increased wildfire. Analysis does not include alternative to require stricter emission mitigation, or mitigation to offset regional impacts.	Coastal effects evaluation for impacts to local coastal economies and natural resources.
Impacts to culturally-important resources in project area (Terminal and pipeline)	Section 4.11 Cultural Resources; Acknowledges the TCP nomination document as part of an impending ethnographic study (pg 4-637). Appendix L: Tables within list many sites in need of further survey and testing or that are currently unevaluated. L-13 mentions TCP and need to assess.	The DEIS does not include relevant information compiled in the traditional cultural property historic district nomination document or the impending ethnographic study from the applicant. Without the information, impacts cannot be assessed, or alternatives identified to avoid, minimize, or mitigate impacts to resources.	Coastal effects evaluation for impacts to cultural resources.

Of most concern to DLCD are the sweeping mitigation and inventory recommendations that rely on the applicant providing the FERC information after issuance of the certificate order for the proposed project. That approach denies other permitting processes at the federal and state level, including federal consistency review, necessary information. Oregon created a networked coastal program, which means

coastal partners and their state authorities are part of the federal consistency review currently under way. Relying on mitigation agreements after the certificate order, leaves partner state agencies without the information necessary to process permits and make decisions, including DLCD. A particular example is Recommendation #6 (pg. 5-13), which requires to the applicant to request and allows FERC to approve major alterations after order issuance ("minor field adjustments," as defined in the DEIS, do not require FERC approval). Such alterations would likely require permit modifications by various state agencies in the coastal zone, and depending upon the significance of the change, implicate an additional federal consistency review per 15 CFR § 930.66. Similar challenges exist for Recommendation #33 for cultural resource inventories and associated plans and comments. Many of these 'post-order' conditions circumvent the state's opportunity to analyze impacts and provide the FERC comments on the extent of impacts and adequacy of mitigation for a broad array of issues in order to inform the final EIS.

The deficiencies of the DEIS identified above and the lack of analysis for relevant topics identified by FERC staff and state coastal partners lead DLCD to recommend that FERC prepare a revised or supplemental DEIS document, as provided for in 40 CFR § 1502.9, that includes the missing environmental analysis with an additional opportunity for public comment before moving toward a final EIS. Without necessary data and information, and adequate analysis of the project impacts, DLCD will be challenged to use the EIS to come to a decision regarding the applicant's certification statement for consistency with the OCMP.

Additionally, FERC should consider detailed comments each coastal partner agency offers in this comment document, not only because they identify deficiencies in the DEIS, but also because the missing information is relevant to analysis of OCMP enforceable policies for the federal consistency review of this proposed project. Each partner agency has provided specific issues related to their mission and regulatory authority. Table 3, below, details information gaps and coastal zone impacts that remain of concern in the DEIS and that are explicitly related to enforceable policies of the OCMP. This list is not exhaustive, however marks major issues that have been ongoing for the duration of the proposed project. If the information remains outstanding and the state agency concern is not ameliorated, it will affect the ability of FERC to issue a license that is consistent with the OCMP. DLCD recommends that FERC resolve these issues before issuance of the final EIS, as well as include them in the final EIS, not only to fully address impacts and mitigation associated with impacts from the project, but also to help align the project more fully with the OCMP.

Table 3. Outstanding issues in the DEIS that are related to CZMA federal consistency review in the Coastal Zone portion of the proposed project. Table 3 is demonstrative; not exhaustive. Additional details for each issue, as well as additional issues, are in each coastal partner comment section. Additional enforceable policies may apply for issues listed.

Broad Issue/Concern	Coastal Partner	Applicable OCMP Enforceable Policy (not exhaustive)
Upland mitigation and temporal mitigation that directly addresses specific impacts for fish and wildlife for the pipeline route. Mitigation noted in DEIS is exclusively for federal lands (currently none on non-federal land; pg 2-36; Section 2.1.7). Mitigation actions address federal lands management goals and may not provide net benefit for fish	ODFW	ORS 496.012

and wildlife.		
Avoidance of Category 1 habitat.	ODFW	ORS 496.012; ORS 496.182
Mitigation for T&E species (no proposed mitigation; pg 5-5; Section 5.1.6)	ODFW, ODA	ORS 496.012; ORS 506.109; ORS 564.115; ORS 564.120
Salvage plans and permits (incidental take) for aquatic construction; protected wildlife have been acknowledged, but not completed by applicant.	ODFW	ORS 496.012; ORS 506.109
Fish passage requirements for crossings.	ODFW	ORS 509.585; ORS 509.610
Ability of project to meet water quality standards such as turbidity, biocriteria, and applicable statewide narrative criteria.	DEQ	Various provisions in ORS chapter 468B
Adequacy of plans for turbidity, sedimentation, dredge material management, construction and post construction stormwater.	DEQ	Various provisions in ORS chapter 468B
Analysis demonstrating avoidance/minimization of wetland impacts at individual wetland/waterway scale.	DSL	ORS 196.800; ORS 196.805; ORS 196.810; ORS 196.815; ORS 196.818; ORS 196.825; ORS 196.830; ORS 196.845; ORS 196.855; ORS 196.880; ORS 196.905
Alternatives to selected dredge material disposal sites and methods.	DSL	ORS 196.800; ORS 196.805; ORS 196.810; ORS 196.815; ORS 196.818; ORS 196.825; ORS 196.830; ORS 196.845; ORS 196.855; ORS 196.880; ORS 196.905
Alternative analysis for size and shape of slip and access channel.	DSL	ORS 196.800; ORS 196.805; ORS 196.810; ORS 196.815; ORS 196.818; ORS 196.825; ORS 196.830; ORS 196.845; ORS 196.855; ORS 196.880; ORS 196.905
Identification of sources and release sites of hydrostatic testing water to avoid out-of-basin diversions, impacts, and identify alternatives.	WRD	Various provisions in ORS chapters 536 and 537
Identification of water sources for project needs like dust control to understand impacts and identify alternatives.	WRD	Various provisions in chapters 536 and 537
Identification of water sources that may result in changes to established diversion locations.	WRD	Various provisions in chapter 537

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Lastly, the DEIS provides a general discussion of the required CZMA consistency certification at section 1.5.1, and a brief analysis for the certification at section 1.5.1.8, section 4.7.1.2, and 4.7.2.3. Specifically, there is a recommended condition at 4.7.1.2 that states:

> "Jordan Cove and Pacific Connector should not begin construction of their respective Project facilities until the companies each file with the Secretary a copy of ODLCD's determination of consistency with the CZMA" (DLCD's emphasis added).

It is unclear whether, or in what manner, FERC could or would enforce this condition. In particular, the use of the word "should" in directing the applicants to not begin construction prior to filing the required consistency certification makes this condition advisory in nature.

The requirement of the CZMA is clear and unambiguous: any license provisionally granted by the FERC is not valid until Oregon has formally concurred with the applicant's certification of consistency. There is specific purpose for the requirement that concurrence with the state's consistency certification is issued before federal permits; that purpose is to ensure that state program requirements have been fully considered and incorporated into any final federal decision. The implementing regulations of the CZMA clearly anticipate and authorize state-imposed conditions to modify a project in order to achieve consistency. Specifically, the provisions of 15 CFR § 930.62(d), state:

> "During the period when the State agency is reviewing the consistency certification, the applicant and the State agency should attempt, if necessary, to agree upon conditions, which, if met by the applicant, would permit State agency concurrence. The parties shall also consult with the Federal agency responsible for approving the federal license or permit to ensure that the proposed conditions satisfy federal as well as management program requirements (see also § 930.4)."

15 CFR § 930.4 further states:

> "Federal agencies, applicants, persons and applicant agencies should cooperate with State agencies to develop conditions that, if agreed to during the State agency's consistency review period and included in a Federal agency's final decision under subpart C or in a Federal agency's approval under subparts D, E, F or I of this part, would allow the State agency to concur with the federal action."

Given that the federal consistency review could result in state-imposed conditions to modify the project, FERC must know the outcome of this review before issuing a decision. However, most importantly, if FERC does issue a license provisioned on obtaining a concurrence from Oregon, it is a matter of federal regulation that the applicant does not begin construction prior to a federal consistency decision. Based on these requirements of the CZMA, DLCD requests that the recommended condition at section 4.7.1.2 be changed to reflect Condition #30 (Section 5.2, pg 5-19) and language altered to be consistent throughout the EIS. The FERC should clarify that pursuant to CZMA § 307 (c)(3)(A), the FERC license is not effective until Oregon concurs with the applicant's consistency certification and that any conditions included with the concurrence will become conditions of the FERC license.

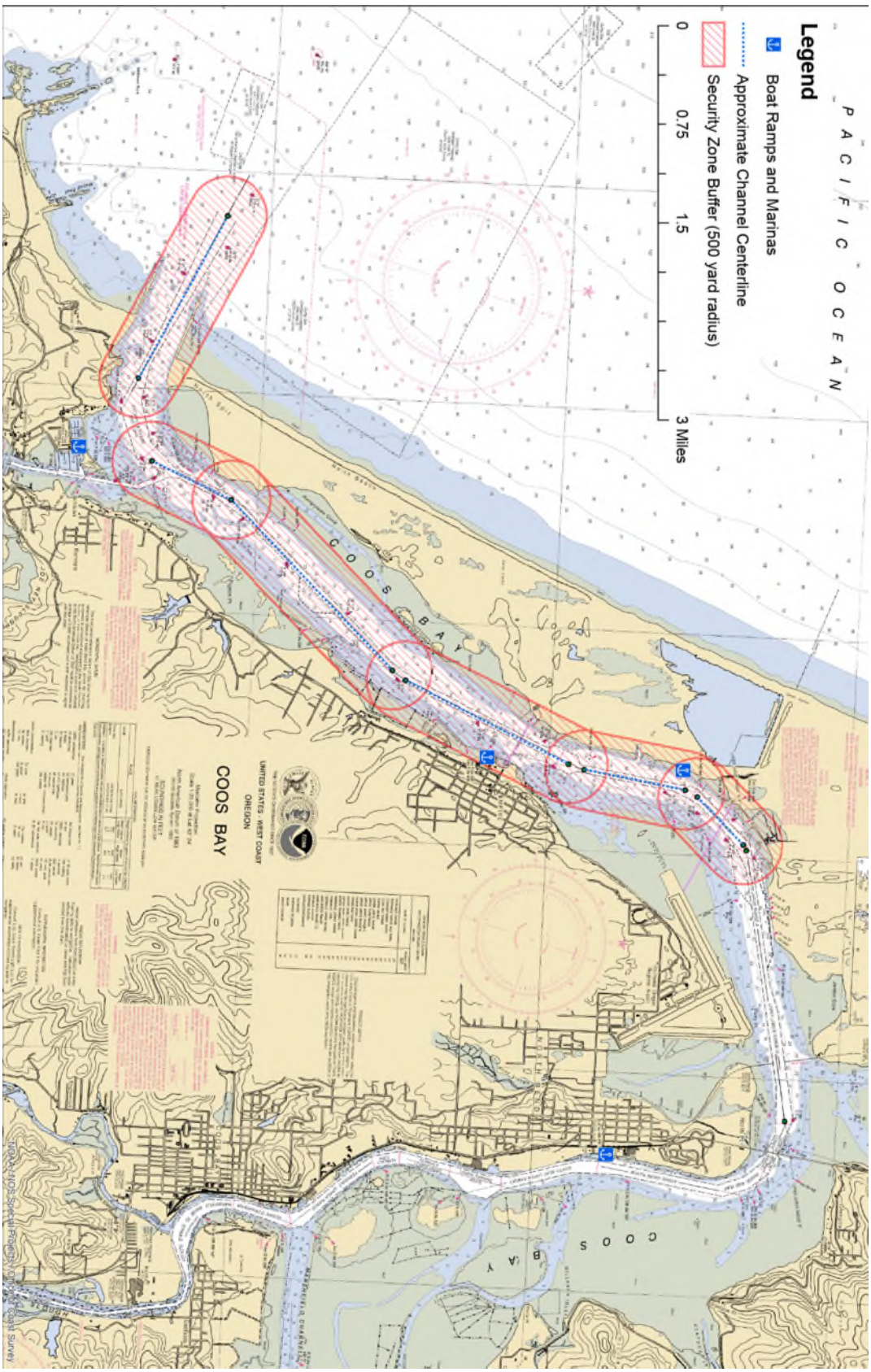
Legend
Boat Ramps and Marinas
Approximate Channel Centerline
Security Zone Buffer (500 yard radius)
0
0.75
1.5
3 Miles
PACIFIC OCEAN
COOS BAY
COOS BAY
OREGON
COOS BAY

Figure 1

Oregon Parks and Recreation Department, State Historic Preservation Office

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As a federal undertaking, compliance with the National Historic Preservation Act (NHPA), specifically, Sections 101 and 106 is necessary for the Jordan Cove Energy Project. The SHPO, as well as other consulting parties, have defined roles in the Section 106 process, included in the implementing regulations (36 CFR 800). Many of our comments below relate directly to the 36 CFR 800 process, which is separate from, but can be coordinated with the National Environmental Policy Act (NEPA) review.

The NHPA review is addressed in the document, and summarized in the Conclusions and Recommendations (5.1) section of the DEIS. In that section FERC states that the cultural resources investigations are incomplete; that they have not yet completed the process of complying with Sections 101 and 106 of the NHPA; and that consultation with tribes, SHPO and applicable federal land-managing agencies have not been concluded. FERC additionally recommends that Jordan Cove and Pacific Connector "not construct or use any of their proposed facilities, including related ancillary areas for staging, storage, temporary work areas, and new or to-be-improved access roads, until all studies and consultation necessary to complete compliance with the NRHP have been completed. A memorandum of agreement (MOA) is recommended to address adverse effects and define treatment plans to mitigate impacts." Regarding these conclusions and recommendations, please consider the following:

Consultation with SHPO
As mentioned above, FERC acknowledges that consultation has not concluded. Consultation is addressed throughout the document, such as on Page 1-27 to 1-28, where it states: "The FERC is responsible under Section 106 and its implementing regulations, to consult with the Oregon State Historic Preservation Office (SHPO), identify historic properties within the APE, and make determinations of NRHP eligibility and project effects, on behalf of all the federal cooperating agencies." On page 4-633 it further states that consultations began with the issuance of the Notice of Intent (NOI) on June 9, 2017. On the following page, it states that previous versions of the projects between 2006 and 2015 informed FERC's current consultations.

While useful for understanding the long history of the undertaking, Oregon SHPO wishes to caution FERC that prior consultations from 2006 to 2015 are less applicable, because in many ways the undertaking is very different. The facility has changed, pipeline routes have changed, staffs have changed, and our understanding of effects to historic properties have become more informed. Due to these changes, meaningful, early and often consultation would provide a solid foundation for compliance with Section 101 and 106 of the NHPA. However, consultation with the lead federal agency has been sporadic, general, and consequently, not meaningful as would be hoped for such a large and complex undertaking.

For example, consultation for the current undertaking is primarily described as the mass- mailed scoping document NOI. Our office responded to the NOI, identifying it as a scoping document, and not consultation. That being said, there was a reference to the need for consultation (per 36CFR800.4) in the NOI, where FERC states: "The project-specific Area of Potential Effects (APE) will be defined in

consultation with the SHPO as the Project develops." Our office responded in a June 27, 2017 letter stating that we looked forward to consulting with FERC on the APE. Our response letter to the NOI is referenced in Appendix L, where under the column heading Purpose/Description it reads: "SHPO will assist FERC staff with the development of a definition for the area of potential effects (APE) for the new project". However, since that letter, our office has not been consulted with on the APE (per 36 CFR 800.4).

It is therefore surprising to see the APE defined in the DEIS on page 4-645, with the incorrect statement "as stated in our NOI, we define the APE as…". The statement is incorrect because the NOI did not define the APE. It merely indicated FERC would consult with SHPO to determine the APE. Since our June 2017 response to the NOI, consultation has not occurred, and the APE was developed without addressing the 36 CFR 800.4 process.

Page 4-633 states that consultation began with the NOI on June 9th, 2017. In the same paragraph, it states that the NOI "contained Section 106-specific text initiating consultations with the SHPO…". As stated above, the NOI is not a consultation document, but rather a public comment /scoping document. For one of the largest undertakings in Oregon, references to consultation mainly include NOI soliciting SHPO for its views on effects on historic properties in a single sentence, and a table in Appendix L that includes two letters from FERC to SHPO (one the NOI, and the second, an invitation to help produce the EIS), and three letters from SHPO to FERC. According to 36 CFR 800.3(c)(3), the agency official should consult with the SHPO in a manner appropriate to the nature of the undertaking. While we understand that the Section 106 process is still on-going, we are concerned at the level of consultation related to the nature of the undertaking, and the failure to include SHPO in consultation on the APE. Our office also feels strongly that consultation with appropriate consulting parties would be incredibly beneficial for this undertaking.

General Comments

As stated above, FERC recommends that Jordan Cove and Pacific Connector "not construct or use any of their proposed facilities, including related ancillary areas for staging, storage, temporary work areas, and new or to-be-improved access roads, until all studies and consultation necessary to complete compliance with the NRHP have been completed." With all the iterations of the project over the years, including the current version, there have been numerous permits and projects conducted that are outside the NHPA process, but should be included due to the potential to effect historic properties. As the lead federal agency, these are issues that could be discussed during meaningful, early and often consultation with consulting parties regarding the undertaking. It is also worth mentioning that communications between consulting parties and the project proponent are referenced in the DEIS as support for FERC consultation. However, when these groups convened to develop a draft Memorandum of Agreement for the undertaking, FERC is on record stating that they will not sign, but instead develop their own MOA and circulate among consulting parties for comment. On that topic, please note, much has been learned since the 2011 MOA, and a similar document would not be considered appropriate or adequate. Since the current group has been meeting for several months, it would be beneficial if FERC engaged the consulting parties in the development of an MOA as opposed to circulating something without their significant input.

Regarding the statement that surveys have identified archaeological sites that require monitoring during construction, and that further testing has been recommended for some sites that cannot be avoided, please note that there are also areas of high probability that would need monitoring, as opposed to only areas where sites have been identified. In addition, there are other types of historic properties that will

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be affected by the undertaking. Part of that is addressed in the DEIS where FERC acknowledges that the Section 101 and 106 processes have not yet been concluded.

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Oregon Department of Transportation

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The Oregon Department of Transportation (ODOT) has the responsibility to preserve the operational safety, integrity, and function of the state's highway facilities. ODOT must also ensure that improvements to the highway system can be accomplished without undue impacts or damage to utilities within the highway right-of-way. It is ODOT's understanding that the proposed Jordan Cove Energy (natural gas terminal facilities) and Pacific Connector Natural Gas pipeline projects and associated activities could or will interface with state and/or interstate highways by crossing the highway, running parallel to the highway within the right-of-way, or running parallel to the highway just outside of the right-of-way. It is also ODOT's understanding that additional access may be needed to ODOT's facilities, and that traffic on ODOT's facilities may increase due to the projects (both during construction and upon project completion during regular operations and project maintenance).

General Requirements

Construction that may impact the state right-of-way (including interstate highways) is subject to Oregon Revised Statute (ORS) 374.305, under which no person, firm, or corporation may place, build, or construct on any state highway right-of-way, any approach road, structure, pipeline, ditch, cable or wire, or any other facility, thing, or appurtenance without first obtaining written permission from ODOT. The developers (Jordan Cove Energy Project, L.P. and Pacific Connector Gas Pipeline, L.P.), therefore, must obtain permits from each ODOT District Office where project work will occur *prior to commencing construction within the highway right-of-way or usage of access connections to the right-of-way*. The developer must also meet the requirements in Oregon Administrative Rule (OAR) Chapter 734 Division 51 for approach permitting and Division 55 for utility permitting through special provisions and should review rule requirements before completing plan sets and construction plans to understand stipulations related to the construction phase and future project operations and maintenance. ODOT Districts have some discretion in the issuance of a permit in order to address site specific situations such as weather/season, traffic volume, terrain, etc.

The following conditions must be fulfilled before a permit to work in the ODOT right-of -way will be issued:

- Developers must notify and work directly with ODOT where the proposed location of the terminal and pipeline facilities and associated activities are shown to be within the Potential Impact Radius (PIR) of any state highway. The PIR is based on minimum federal safety standards found in 49 CFR Part 192.
- Developers shall provide ODOT with a set of plans that include, but are not limited to, detailed construction staging plans for the terminal facility and associated LNG transfer facilities (e.g., Wharf, LNG storage tanks), expansion of upland industrial lands and access road improvements as well as pipeline route maps and construction staging plans. Developers will work with ODOT to develop

design standards for all pipes and related structures within the PIR of a state highway. Design requirements include the following:

- Minimum of 10 feet of cover from the top of the pipe will be the norm unless special acceptance of a lesser amount is authorized for a specific reason. A minimum of 10 feet of cover should be used as the standard within ODOT right-of-way.
- All pipe crossings of the highway shall be properly cased, or – for uncased pipeline crossings – a substantial increase in the pipeline design standards will be required.
- In no instance shall the pipeline be installed in an open trench across a state highway.
- In no instance shall the pipeline attach to or be suspended within state highway bridge structures.
- State highway access to all pipeline surface structures and assemblies, such as but not limited to gate valves and monitoring equipment, shall comply with OAR 734 Division 051 and all required conditions stated herein. A preferred location for pipeline surface structures and assemblies is outside of state highway right-of-way.
- Temporary state highway access locations, used for construction activities, shall also comply with OAR 734-051 and all required conditions stated herein. Modifications appropriate to provide safe operation shall be constructed at all temporary state highway access locations, prior to construction usage. Safety modifications must be removed and the state highway and access points be returned to their original condition upon completion of construction activities.
- Applicant must address specific site concerns associated with their terminal and pipeline route and associated project facilities. These concerns shall be addressed to the satisfaction of the appropriate Oregon Department of Transportation District offices prior to issuance of a permit to perform work within the state's highway right-of-way.
- Annually, or as changes dictate, updated emergency contact information (names and phone numbers) shall be delivered to each ODOT District Manager in which the terminal and pipeline and associated project facilities may affect state highway operations and maintenance activities.

The developers are responsible to secure all state, federal, and local permits and clearances as required under federal, state, and local statutes or codes for all areas within ODOT state highway right-of-way that are impacted by the development.

All impacts to the traveling public on state highways will be approved by the ODOT local District Office(s) prior to those impacts occurring. Utility coordination will be the responsibility of the developers. The terminal and pipeline projects will need to provide traffic mitigation for all state highways affected, and the mitigation approved by ODOT prior to and for the duration of the impact.

Highway Classification and Milepoints

It is unclear throughout the DEIS when a "state highway" is being referenced. A permit from ODOT would be required for any work on a highway that is part of the state highway system including Interstate highways and other highways on the National Highway System. It would be prudent to

specifically identify all highways and roads by their appropriate jurisdictional authority; as part of the National Highway System, State Highway System, County Highway System, and other local, private, and federal land management agency roads. Properly identifying the correct highway and road classification is necessary to submit permit requests to ODOT as well as the other agencies or owners.

Highway Classification

In DEIS Section 4.10.2.1 (Access Roads), not all of the highways listed on page 4-626 to be crossed by the pipeline "*Major state and federal highways that would be crossed by the pipeline include*" are part of the state highway system, as follows:

- Highway 227, and Butte Falls Highway, are both under Jackson County road authority and therefore are not part of the State Highway System. Crossings of those County highways should be coordinated with that County road authority.
- ODOT does not allow open cut crossings on the State Highway System, including Interstate Highways.

Highway Milepoints

Also in DEIS Section 4.10.2.1, and also in Appendix C: *Pipeline Route and Work Area Maps*, ODOT recommends clarifying that the Milepoints ("MP") depicted both in written text in Section 4.10.2.1 and as displayed on maps and other graphics in the DEIS and Appendix C are "Pipeline MPs". ODOT also recommends that on the Pipeline Location Maps in Appendix C that every location where the pipeline intends to cross a State or Interstate Highway, the approximate State Highway Milepoint (MP) should also be displayed and in a different color than the pipeline Milepoints. This will eliminate confusion for the reader and should add consistency with Section 4.10.2.1 with the [corrected] listing of **"***Major state and federal highways that would be crossed by the pipeline include*"**.**

Traffic Impacts

In DEIS Section 4.10.1.2 (Motor Vehicle Traffic), on page 4-625, the DEIS recommends, and ODOT agrees and further recommends to the FERC, that:

Prior to construction, Jordan Cove should file documentation that it has entered into development agreements with ODOT, Coos County, and the City of North Bend, as recommended in the *Traffic Impact Analysis* report.

Over-sized Loads

ODOT recommends that the DEIS clearly state and reference requirements for Over Dimensional (O-D) permitting for the operation of the pipe delivery trucks, and any other over-dimensional loads, that will operate on state and interstate highways. O-D permitting on ODOT highways requires District approval for specific length trucks. Routing, time-of-day, and pilot vehicle requirements will be enforced, as appropriate, for the "hauling routes" in all affected ODOT Districts. The developers should reference ODOT's Over-Dimension Operations website in the DEIS for permitting procedures and requirements: https://www.oregon.gov/ODOT/MCT/Pages/Over-Dimension.aspx

Pipeline Building/Trenching and Depth

The proposed pipeline burial methods and pipeline depth information provided in the DEIS do not fully conform to ODOT's standard requirements. All ODOT highways are required to be crossed via boring, directional drilling, or other tunneling techniques. Developers must work with ODOT District Permitting and receive approval prior to any digging activities on or along ODOT right-of-way.

ODOT requires the pipeline to be installed with a minimum of 10 feet of cover within the entire roadway right-of-way, measured at the lowest point within the right-of-way—for instance, below the lowest ditch bottom—for all Districts. *This includes all ODOT state highway and interstate highway crossings within those highways' right-of-way boundaries.*

Additionally, the pipeline design team will need to submit calculations that insure that the pipe wall thickness, at all highway crossings, is increased so that bursting pressure meets or exceeds the "49 CFR PART 192, Class 3" standards, for a Potential Impact Radius (PIR) > 900 feet. ODOT recommends that the DEIS reference this calculation consistent with all appropriate state and interstate highway crossings and that those highway crossings be indicated by approximate highway Milepoint (in text and in graphics as relevant).

Utility Coordination

Utility relocation requires approval and coordination with ODOT for any work in/across/under ODOT right-of-way if not otherwise included in permit requests. Specific utility relocation requests will be handled through the appropriate ODOT District Office. Any permit issued by ODOT would be issued to the utility company that owns the utility line or facility, not to their contractor. If Pacific Connector is the utility owner, then the permit would be issued to them.

Oregon Department of Water Resources

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No.	Citation	Issue Identification	Recommended Resolution
1	Section 2 – Description of the Proposed Action. Pg.2-61 & 2-62 (PDF Pgs. 132-133)	**Diverted Open-Cut Crossing, with references to Flume, or Dam and Pump.** This section fails to account for interference with and/or damage to an existing water right holder, or diversion structures that might be located in an area that water would be diverted from during use of these methods.	This Department recommends that the applicant research any stretches of streams where these methods are contemplated, to determine if water rights exist. Water right holders that could be affected may need to be contacted to determine the best way to mitigate impacts.
2	Section 4.3 – Water Resources and Wetlands, In-Stream Flow sub-section. Pg.4-109 (PDF Pg. 297)	**Hydrostatic Testing.** This section speaks to the sources for obtaining water for hydrostatic testing, and that for any surface-water use, proper authorization would be obtained from OWRD. Existing water rights, other than municipal use, cannot be used because they are issued for a specific use in a specific location, possibly during a specific time.	Water from any source other than a municipality will require authorization from OWRD. A Limited License under ORS 537.143 is a typical method for obtaining water on a short term or fixed duration basis. The applicant is advised to contact the Department well in advance of water needs to determine best sources.
3	Section 4.3 – Water Resources and Wetlands, In-Stream Flow sub-section. Pg.4-111 (PDF Pg. 299)	**Out-of-basin diversions**. This section speaks to release of hydrostatic test water and the *Draft Hydrostatic Testing Plan* developed with input from several groups. OWRD was not consulted on this draft plan. The document states, “Where possible, test water would be released within the same basin from which it is withdrawn.” ORS 537.801 et seq. addresses diversion of waters from basins of origin and defines “Basin” to mean “one of the	The applicant is advised to work closely with the Department to locate sources of water and to determine the appropriate mechanisms for appropriating water. Insofar as a significant amount of water may be transported outside the boundaries of the basin of origin, the applicant must work with the Department through the processes provided in ORS 537.803 – 870.

		river basins within this state" as defined by Department maps. ORS 537.801(3) states, "…the waters of the state may not be appropriated, stored or diverted for use outside the basin of origin except in compliance with ORS 537.801 to 537.860, including, if applicable, the prior approval of the Legislative Assembly under ORS 537.810."	
4	Section 4.3 – Water Resources and Wetlands, In-Stream Flow sub-section. Pg.4-112 (PDF Pg. 300)	**Dust Control.** This section speaks to the sources for obtaining water for dust control, and that for any surface-water use proper authorization would be obtained from OWRD. Existing water rights, other than municipal use, cannot be used because they are issued for a specific use in a specific location, possibly during a specific time.	Water from any source, other than a municipality, will require authorization from OWRD. A Limited License under ORS 537.143 is a typical method for obtaining water on a short term or fixed duration basis. The applicant is advised to contact the Department well in advance of water need to determine appropriate sources.
5	Section 4.3 – Water Resources and Wetlands, Point of Diversion Effects sub-section. Pg.4-118 (PDF Pg. 306)	**Alternate Point of Diversion Locations.** This section discusses consulting with the landowner if impacts on a water supply's point of diversion cannot be avoided, identifying an alternate location to establish the diversion.	Changing the location of a point of diversion under an existing water right requires state approval through a transfer application process, pursuant ORS 540 and OAR 690-380. The Draft EIS does not address or contemplate this requirement. The applicant is advised to work closely with the Department in regards to alternate points of diversion locations and apply for the required transfer well in advance of water needs.
6	Section 5 – Conclusions and Recommendations, #25. Pg.5-18 (PDF Pg. 1104)	**Instantaneous Flow Reduction.** This recommendation relates to the Hydrostatic Test Plan, requiring that any water withdrawal from a flowing stream does not exceed an instantaneous flow reduction of more than 10 percent of	Please be aware that withdrawal not exceeding an instantaneous flow reduction of more than 10 percent of stream flow may, in the absence of mitigation, cause an impact or injury to existing water rights, including but not limited to, instream water rights.

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		stream flow.	

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Oregon Department of Forestry

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The ODF's comments are primarily related to the clearing, grading, construction, operation, and maintenance of project components that would be located across state and privately owned forest lands. In these instances project operators are responsible for review and compliance with applicable requirements found in statute and code.

Depending on the location of project activities, operator requirements and considerations may include but are not limited to the following conditions:

State and Private Forest Lands - Project activities involving commercial forest activity on state and private forest lands are governed by the Oregon Forest Practices Act, Oregon Revised Statute (ORS) 527, and Oregon Administrative Rules (OAR) chapter 629 divisions 605 through 665. These apply even though the forest activity is a peripheral component of the project (DEIS Section 4.5.2 Timber). The forest practice rules are intended to provide resource protection and to set standards for planning forestry practices including harvesting, road construction and maintenance, protecting water quality in waters of the state, limiting effects on specified wildlife and other resource sites, chemical and petroleum product provisions, fish passage, peak flows, providing for public safety down slope of high landslide hazards, and determining reforestation or land conversion requirements.

Conversion of Forestlands – While nothing in the Forest Practices Act shall prevent the conversion of forestland to any other use (ORS 527.730), administrative rules address the conversion to non-forest use to ensure the conversion process is coordinated with other relevant federal, state, and local agencies.

Protection of forestlands from wildfire (Permit to Use Fire or Power Driven Machinery (PDM) The Oregon Department of Forestry is responsible for matters related to wildfire on forests within the state and project activities occurring on forest land may be subject to wildfire prevention and suppression requirements of Oregon Revised Statute chapter 477 and the associated administrative rules. In addition, every person conducting an operation inside or within 1/8 of a mile of an ODF forest protection district that uses fire or power driven machinery must first obtain a written permit (within the Notification), also known as a PDM. Fire prevention requirements must be adhered to. Some of these include but are not limited to: the need to limit or stop work during periods of elevated fire danger, the need to provide firefighting tools, the need to provide water supplies and pumping equipment, the need to provide fire watch personnel, the need to suppress wildfires originating from forest activities and construction, the need to dispose of debris in a specified manner, and the need to accept liability for the state's cost of suppressing wildfires originating from forest activities and construction. Following completion of the initial project activity, operation and maintenance activities will be subject to many of these same requirements. Additional information regarding these requirements is available at the Oregon Department of Forestry's website, http://www.oregon.gov/odf/Pages/fire/fire.aspx.

Additional comments are provided in the following table:

No.	Citation	Issue Identification	Recommended Resolution
1	Section 1.5.2.6, Oregon Department of Forestry, Page 1-32, Para 2	This section acknowledges the need for Notification for a forest operation but fails to address that need for a written plan for all ownerships where operations occur.	The DEIS discusses harvest and loss of forestland but fails to acknowledge the submission of a written plan in addition to notification. Written plans are part of the submission and such plans are an accompanying document to Notification. The Notification serves three purposes: notification of a forest operation (ORS 527.670), a request for a Permit to Use Fire or Power Driven Machinery (PDM, ORS Chapter 477), and notice to the Department of Revenue of timber harvest (ORS 321.550). Notifications are to be submitted via the online E-Notification system (www.ferns.odf.state.or.us/E-Notification). A separate notification should be filed for each county and timber owner affected by the project. All notifications require a 15 day waiting period before activity may begin unless a waiver is requested.
2	Section 4.7.2.2, Existing Land Use, Forestland, Page 4-417, Para 1	This section refers to regulatory requirements and route and clearing upland forest and land use change. This section fails to mention the need for an Alternate Practice where land use change results in a conversion of forestland.	The DEIS discusses harvest and loss of forestland, in which case conversion of forestland to other land uses (ORS 527.730) or practices not in statute or rule requires the submission of a Plan for Alternate Practice and written approval from the State Forester at the time of the operation.
3	Section 4.1.2.4 Landslide Hazards and Slope Stability Page 4-18 thru 4-25, Para 1	Section refers to Landslide and Slope Stability, but does not reference forest operations. Forest Practices Act landslide hazard assessment and standards may be applicable. Reference to forest operations is absent.	It is anticipated that most or all landslide public safety hazards associated with the project will fall under other jurisdictions due to land use conversion. Where clearings are not permanent and forest land use is maintained or proposed roads have a combined Pipeline and forest use, provisions for public safety under Forest Practices Act Rule Division 623 may be necessary. Reference to appropriate sections of the final EIS with equal or greater protection standards may also meet requirements.

4	Potentially Contaminated Soils and Groundwater, Accidental Spills Section 4.2.2.2, Pages 4-59 through 4-68.	Forest Practices Act and Chemical Rules standards may be applicable in the course of forest operations, reference to the FPA and forest operations is absent.	Provisions for spills of hazardous materials or applications of chemicals may have applicable standards under Forest Practices Act Rule Division 620 or reference to appropriate sections of the final EIS with equal or greater protection standards.
5	Surface Water, Pacific Connector Pipeline Project Section 4.3.2.2, Page 4-92 and other sections relevant to water quality	Forest Practices Act and water quality linkage, document does not identify relationship with FPA required written plan or alternate plan where water quality elements are	Through the Notification process, provisions for surface water quality under the Forest Practices Act (FPA) and rules will need to be addressed. Details would be submitted in either a Written Plan or Alternate Plan. Details may include specific provisions for meeting the FPA or reference appropriate sections of the final EIS with equal or greater protection standards or where land use conversion places water protection under other jurisdictions.
6	Wetlands Section 4.3.3, Pages 4-118 through 4-134	Forest Practices Act and wetland, lake linkage	Through the Notification process, provisions wetlands under the Forest Practices Act (FPA) and rules may need to be addressed (Divisions 645, 650, 655). Details would be submitted in either a Written Plan or Alternate Plan. Details may include specific provisions for meeting the FPA or reference appropriate sections of the final EIS with equal or greater protection standards or where land use conversion places water protection under other jurisdictions.
7	Other Special Status Species Section 4.6.3 page 4-368 Para 1	This section speaks about additional wildlife species that have special status or consideration by other federal or state agencies, beyond those listed as Threatened or Endangered under the federal ESA. The Oregon Forest Practices Act requires protections for certain wildlife species under Oregon Administrative Rule 629, Division 665. The FPA has specific rules for Northern Spotted Owl nest sites (OAR-629-	Forestry recommends that the applicant address protections afforded to wildlife under the Oregon Forest Practices Act in the EIS. Of particular note is the great-blue heron. Although this species is protected by law through the FPA, in association with forest operations, it is not addressed as a special status species in the EIS. Furthermore, these protection standards need to be addressed throughout the EIS. Activities such as timber harvest operations that occur near a known site of one of these species may require a written plan to address

		665-0210); Bald Eagle nest sites (OAR 629-665-0220), winter roost sites (OAR 629-665-0230), and foraging perch sites (OAR 629-665-0240); Osprey nest sites (OAR 629-665-0110), and Great Blue Heron rookeries (OAR 629-665-0120). Written plans which describe how forest operations will be conducted to avoid a conflict may also be required for operations near known sites of marbled murrelets under OAR-629-0170(5)(d) or OAR-629-0190(2). Similarly, written plans may be required for operations near certain band-tailed pigeon mineral springs or golden eagle nest sites under OAR-629-0170(5)(a) or OAR-629-0190(1).	how the operation will be conducted to avoid a conflict with the wildlife site. Exceptions to the FPA rules for spotted owls or marbled murrelets may apply if the applicant has a valid Incidental Take Permit from the USFWS. Other exceptions would need to be addressed through a Plan for Alternate Practice which must indicate how the operation will be conducted to result in a net equal or greater outcome for the species in question.
8	Other Special Status Species Section 4.6.3 page 4-368 Para 1	The proposed route indicates that the Pacific Connector pipeline project may go through or near known nest patches of spotted owls.	Forest operations on non-federal lands near a known nest site of a spotted owl may require a Written plan or Plan for Alternate Practice. This may include a requirement to designate a 70 acre core area of suitable spotted owl habitat, as described in rule in OAR 629-665-0210(1)(a). Exceptions to the FPA rules for spotted owls may apply if the applicant has a valid Incidental Take Permit from the USFWS. Other exceptions would need to be addressed through a Plan for Alternate Practice which must indicate how the operation will be conducted to result in a net equal or greater outcome for the species in question.
9	Section 4.6.3 page 4-368 Para 1	This section describes “special status species”. The FPA and species which receive protection under the FPA are not included in this section or Appendix I.	Recommend adding Oregon Department of Forestry and species protected under the Forest Practices Act to this section and Index referencing “special status species”.

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Appendices

Appendix A: ODFW Recommended Mitigation Actions: Coos, Coquille, Umpqua, Rogue, and Klamath Watersheds

Table 1. Examples of projects with high to moderate ecological benefit for aquatic fish and wildlife resources.

Ecologically Beneficial Aquatic Related Projects Noted in DEIS	**Ecologically Beneficial Upland Related Projects Noted in DEIS**
Riparian planting; riparian enhancement; riparian easements; etc.	Relocation of matrix to LSR
Fish Passage Improvements	Noxious weed treatments
Large Wood instream	Road Closures
Relocation of matrix to LSR	Riparian planting; riparian enhancement; riparian easements; etc.
Road decommissioning	Snag creation
Stream crossing repair	Riparian Vegetation Management (thinning/Stack and burn)
Road storm-proofing	Pre-commercial thinning designed to improve mature forest conditions
Road Surfacing	Upland LWD placement
Road Closures	Pre-commercial thinning designed to improve mature forest conditions

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Riparian Vegetation Management (thinning/Stack and burn)	Planting for Mardon Skipper

List 1. Potential projects to mitigate for aquatic resource impacts and sites in the Rogue River basin.

Streams crossed by pipeline

Little Butte Creek

1. Top RBFAT passage sites: Charlie; Bieberstad; Walcot; LBID site; Brown Ditch; Tucker Ditch; LBMD, others
2. Funding for water leases with willing landowners
3. Fund replacement of county culvert on Bitterlick Creek
4. Riparian project on Eagle Point urban tributaries, especially the golf course near the visitor center

NF Little Butte Creek

1. Top RBFAT passage sites: Hanley; MID NFLB, others
2. Funding for water leases with willing landowners
3. Find and implement riparian projects

SF Little Butte Creek

1. Top passage sites: MID SFLB; Hoeft Ditch; Klingle Meyers; Ragsdale; Tonn Ditch; Burrell Ditch; Omega, others
2. Funding for water leases with willing landowners
3. Find and implement riparian projects
4. Bank stabilization, fencing, planting on West/Hodgkin properties

Salt Creek

1. Passage at C2 Cattle Ranch diversion, coho found higher in the system
2. Culvert replacement on tributaries.

Indian Creek

1. Find and implement passage projects
2. Funding for water leases with willing landowners
3. Find and implement riparian projects
4. Implement large wood projects on BLM land
5. Implement outreach at Aunt Caroline's Park in Shady Cove

WF Trail Creek

1. Culvert replacement on West Fork and trib of West Fork at mill property
2. Culvert replacement on Buck Rock Creek (ODOT).
3. Culvert replacement on X trib near confluence of Trail Creek and Rogue.
4. Funding for water leases with willing landowners
5. Large wood projects on BLM land on West Fork Trail
6. Additional engineered wood structure on private land on West Fork Trail

<u>High priority summer steelhead steams (tribs of pipeline streams)</u>

Lost Creek

1. Riparian fencing and planting project on ranch property
2. Riparian projects on other private above ranch
3. Large wood project on ranch property

Lake Creek

1. Riparian fencing and planting project on ranch property
2. Find and implement passage projects where applicable

Antelope Creek

1. Restoration on ODOT property at confluence with Little Butte Creek???
2. Find and implement passage projects
3. Funding for water leases with willing landowners

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4. Find and implement riparian projects

Other streams with high potential for restoration

Big Butte Creek

1. Funding for water leases with willing landowners

Table 2. Aquatic restoration/mitigation potential projects in the Rogue River basin.

Admin Unit	Fifth Field	Mitigation Group	Project Name	Quantity	Unit	Rationale
Medford BLM	Trail Creek	Aquatic and Riparian	Trail Creek Instream LWD	2.6	miles	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by Pacific Connector.
Medford BLM	Trail Creek	Road Surfacing	Road sediment reduction	16.3	miles	Road surfacing helps reduce sedimentation.
Medford BLM	Trail Creek	Road storm proofing	Road sediment reduction	4.3	miles	Storm-proofing restores hydraulic connectivity and reduces sediment.
Forest Service	Trail Creek	Road storm proofing	Road sediment reduction	0.6	miles	Storm-proofing restores hydraulic connectivity and reduces sediment.
Forest Service	Trail Creek	Rd decommissioning	Road sediment reduction	1.1	miles	Reduces sedimentation and restores hydraulic connectivity.
Medford BLM	Trail Creek	Rd decommissioning	Road sediment reduction	2.7	miles	Reduces sedimentation and restores hydraulic connectivity.
Medford BLM	Shady Cove-RR	Aquatic and Riparian	LWD	2.5	miles	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by Pacific Connector.
Medford BLM	Shady Cove-RR	Road sediment reduction	Road sediment reduction	1	miles	Improve existing roads.
Medford BLM	Shady Cove-RR	Road re surface	Road sediment reduction	1.5	miles	Improve existing roads.
Medford BLM	Big Butte	Road Surfacing	Road sediment reduction	6.4	miles	Reduces sedimentation and restores hydraulic connectivity.

Medford BLM	Little Butte	Road sediment reduction	Road sediment reduction	9	miles	Resurface roads in the Ashland RA
Medford BLM	Little Butte	Road sediment reduction	Road sediment reduction	9.4	miles	Resurface roads in the Butte Falls RA
Forest Service	Little Butte	Aquatic and Riparian	S Fk Little Butte LWD	1.5	miles	Placing 75 pieces of LWD into the South Fork by helicopter.
Forest Service	Little Butte	Aquatic and Riparian	Stream crossing decom.	32	sites	Restoring stream crossings reconnects aquatic habitats. Restoration includes riparian plantings to offset impact of shade removal at pipeline X's.

Table 2. Aquatic restoration/mitigation potential projects in the Rogue River basin continued.

Admin Unit	Fifth Field	Mitigation Group	Project Name	Quantity	Unit	Rationale
Forest Service	Little Butte	Road sediment reduction	Road decommissioning	53.2	miles	Remove roads and re plant.
Medford BLM	Little butte	Aquatic and Riparian	Little Butte Cr Fish Screen	1	site	Screen Lost Creek diversion and build permanent diversion structure.
Medford BLM	Little butte	Aquatic and Riparian	Lost Creek Instream LWD	8.6	miles	Lack of large wood and recruitment of LWD into streams is a consistent factor limiting aquatic habitat quality in all watersheds crossed by Pacific Connector.
Medford BLM	Little butte	Road sediment reduction	Little Butte Cr road imprv.	3.5	miles	Improve existing roads by restoring surface.
Medford BLM	Little butte	Road sediment reduction	Little Butte Cr rd decom.	10.6	miles	Remove roads to decrease sediment input in the Ashland RA.
Medford BLM	Little butte	Road sediment reduction	Little Butte Cr rd decom.	2.4	miles	Remove roads to decrease sediment input in the Butte Falls RA.

List does not include terrestrial habitat improvements, fire suppression, or stand density fuel break mitigation on federal land.

These actions are for off site mitigation only. On site mitigation includes placement of LWD at crossings etc.

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List 2. Information for properties with potential for mitigation related to aquatic resources.

Dodes Cr Road Elk Creek subbasin

http://www.landandfarm.com/property/175.1_Acres_in_Jackson_County_Oregon-1473980/

Kane Cr

http://www.landandfarm.com/property/517.56_Acres_in_Jackson_County_Oregon-1473891/

Antelope Creek—**Antelope Creek Conservation Opportunity Area**

http://www.landandfarm.com/property/58_Acres_in_Jackson_County_Oregon-1471319/

Modoc Road with vernal pool:--**North Medford Conservation Opportunity Area**

http://www.landandfarm.com/property/212.67_Acres_in_Jackson_County_Oregon-1298398/

Evans Creek –1.5 miles of creek frontage

http://www.landandfarm.com/property/Rural_Residential_See_Remarks_Rogue_River_OR-1365916/



Indian Creek/Crowfoot Creek—**Shady Cove Foothills Conservation opportunity Area**

This isolated acreage is surrounded by Federal BLM land and is located in the heart of a well-known elk hunting area. The topography is graced with peaks and valleys that are permeated with logging roads and skid trails throughout. The headwaters of both Indian Creek and Crowfoot Creek originate on the parcel. The average elevation is 2500' MSL and the site index provides a mixture of merchantable timber, oak groves and open rock faces. Timber inventory data reveals a mixture of timber types and volumes. This property is uniquely located between Lost Creek Lake, the Rogue River, Big Butte Creek and the town of Shady Cove and is made up of three separate but contiguous tax lots

http://www.landandfarm.com/property/480_Acres_in_Jackson_County_Oregon-1674024/

Headwaters of Dead Indian Creek

This idyllic parcel is comprised of one square mile of gently undulating wilderness terrain and is endowed with over a mile of frontage of the headwaters of Dead Indian Creek, a major tributary of the South Fork of Little Butte Creek. The property lays just 1/2 mile from a paved county road and yet is completely surrounded by and easily accessed through BLM land on all sides. It's adjacent to the popular Buck Prairie recreational trail system, a winter haven for snowmobiling and cross country skiing enthusiasts, and a summer hiking and hunting mecca. It's just 5 miles to the boat launch at Howard Prairie Lake Recreation Area, a major local fishing, sailing and boating attraction.

There is plenty of merchantable and sub-merchantable timber growing on the property making this a legitimate and sustainable legacy investment opportunity. The property rests at about 5000' elevation.

http://www.landandfarm.com/property/648_Acres_in_Jackson_County_Oregon-1380787/

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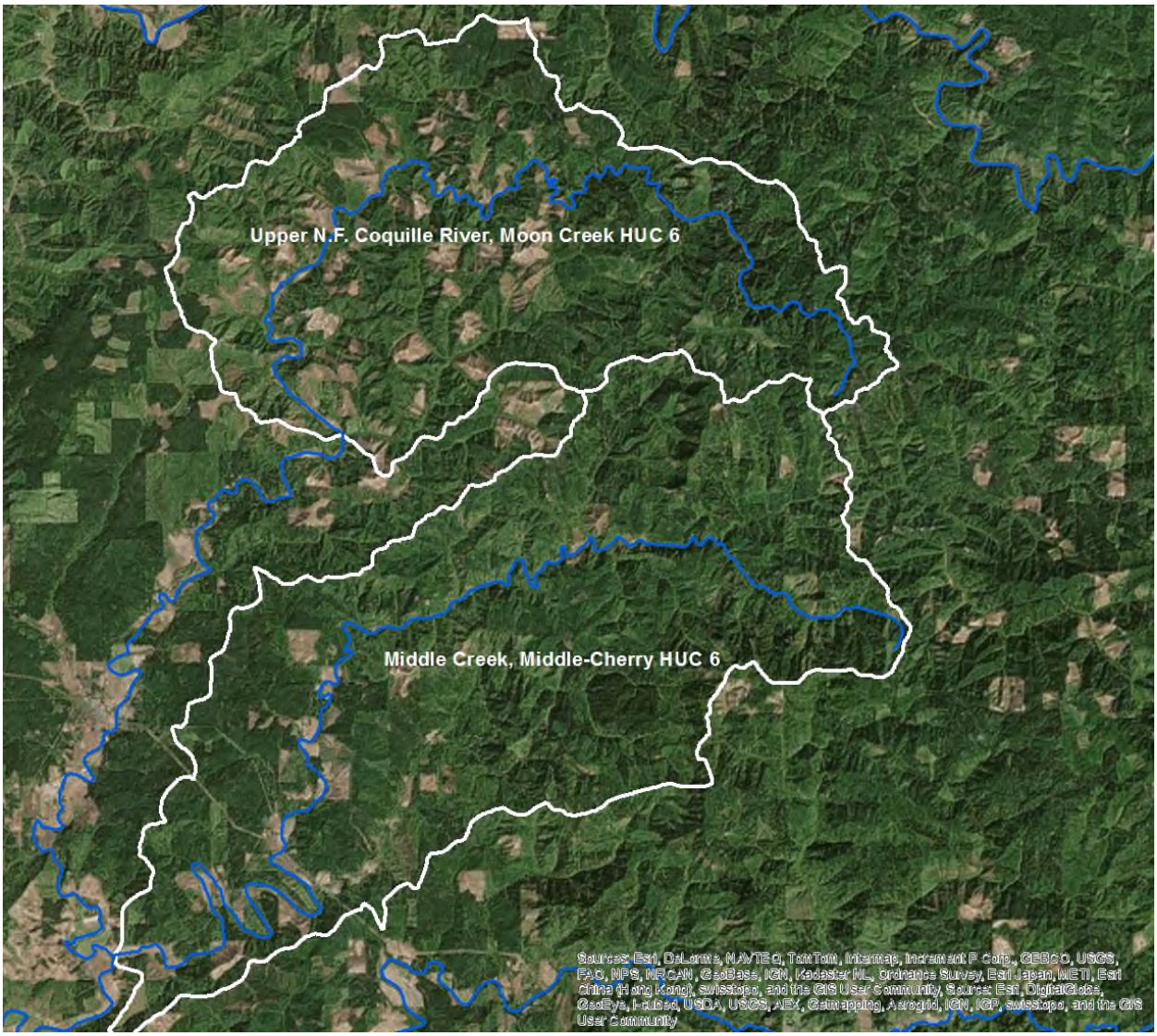

Figure 1. Subwatersheds in the Coquille River Basin with high potential for benefits to wildlife habitat, water quality and fisheries resources through: 1. older age timber management (80-120yrs.); 2. road decommissioning; 3. High Landslide Hazard Location stand easements establishment; 4. Riparian corridor easements/purchase.

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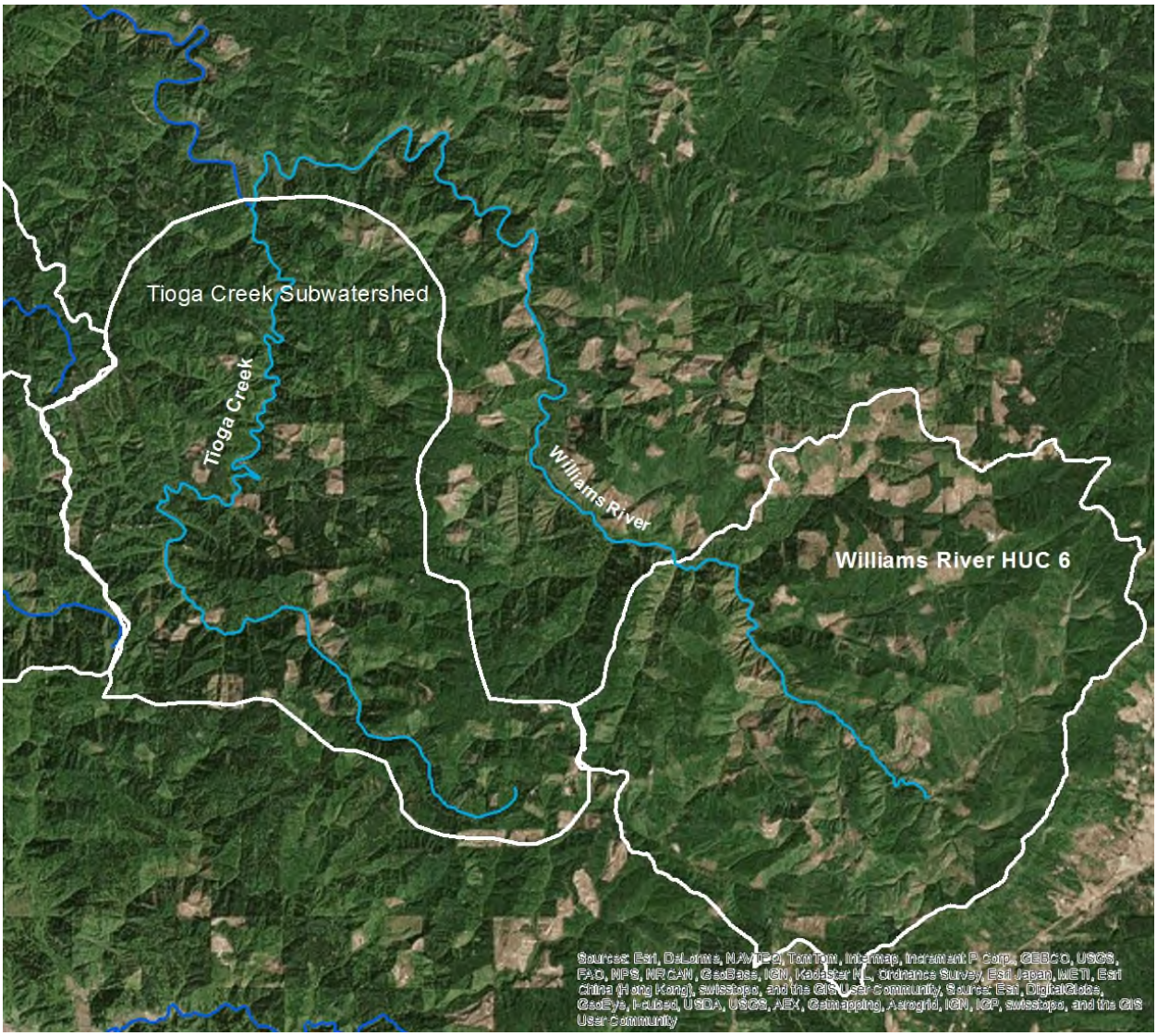

Figure 2. Subwatersheds in the Coos River Basin with high potential for benefits to wildlife habitat, water quality and fisheries resources through: 1. older age timber management (80-120yrs.); 2. road decommissioning; 3. High Landslide Hazard Location stand easements establishment; 4. Riparian corridor easements/purchase.

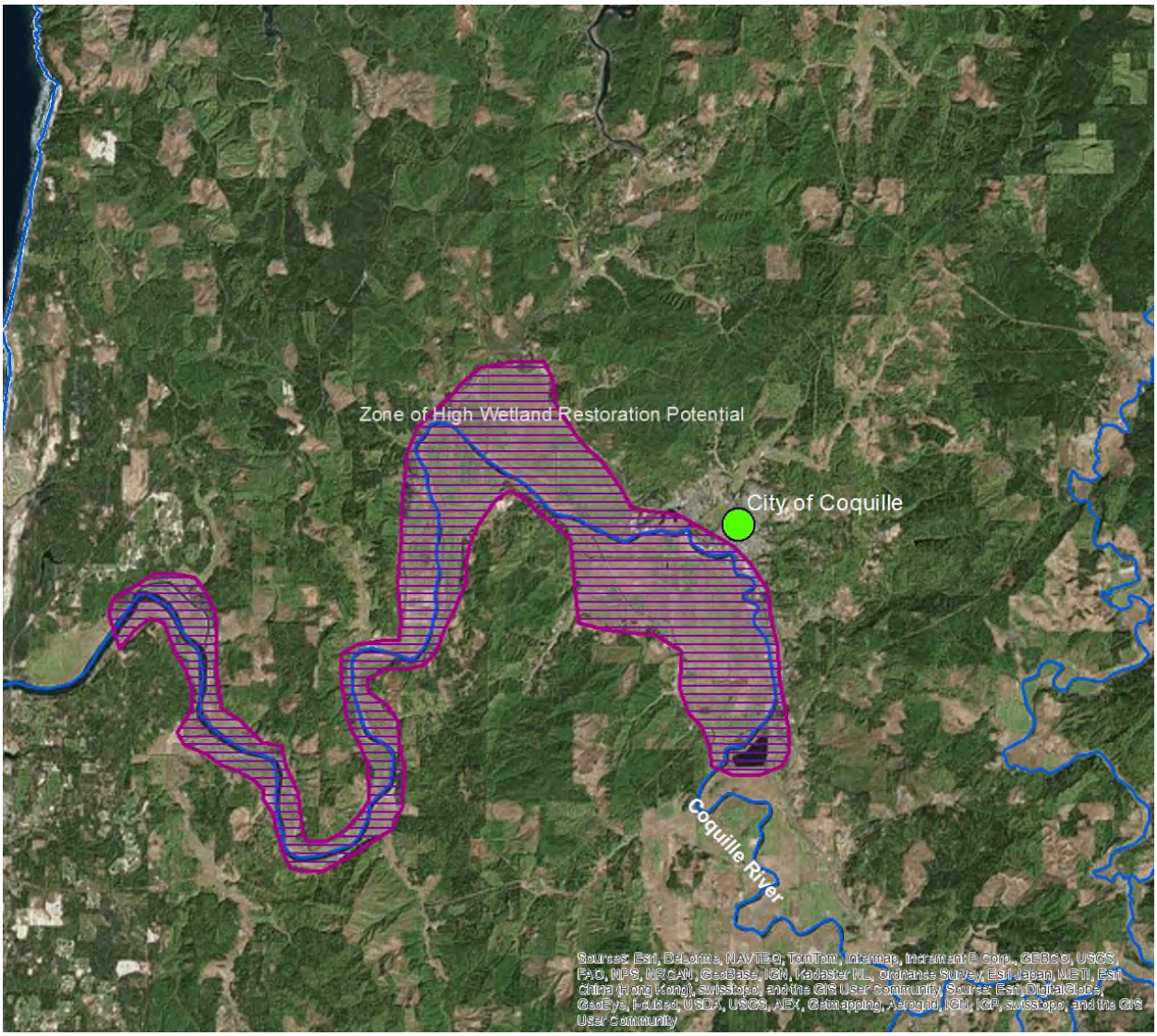

Figure 3. Subwatershed in the Coquille River basin with high potential for benefits to fish and wildlife resources through wetland restoration and protection.

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Table 3. Types of mitigation projects that could be conducted on purchased mitigation lands in Jackson County

Wedgeleaf Ceanothus brush clearing
Oak stand thinning
Removal of small diameter conifers from oak stands
Controlled burns
Travel management patrols
Repair of ground degraded by
Restoration of hardwood component in stands with history of conifer management
Noxious weed control
Placement of LWD in upland areas

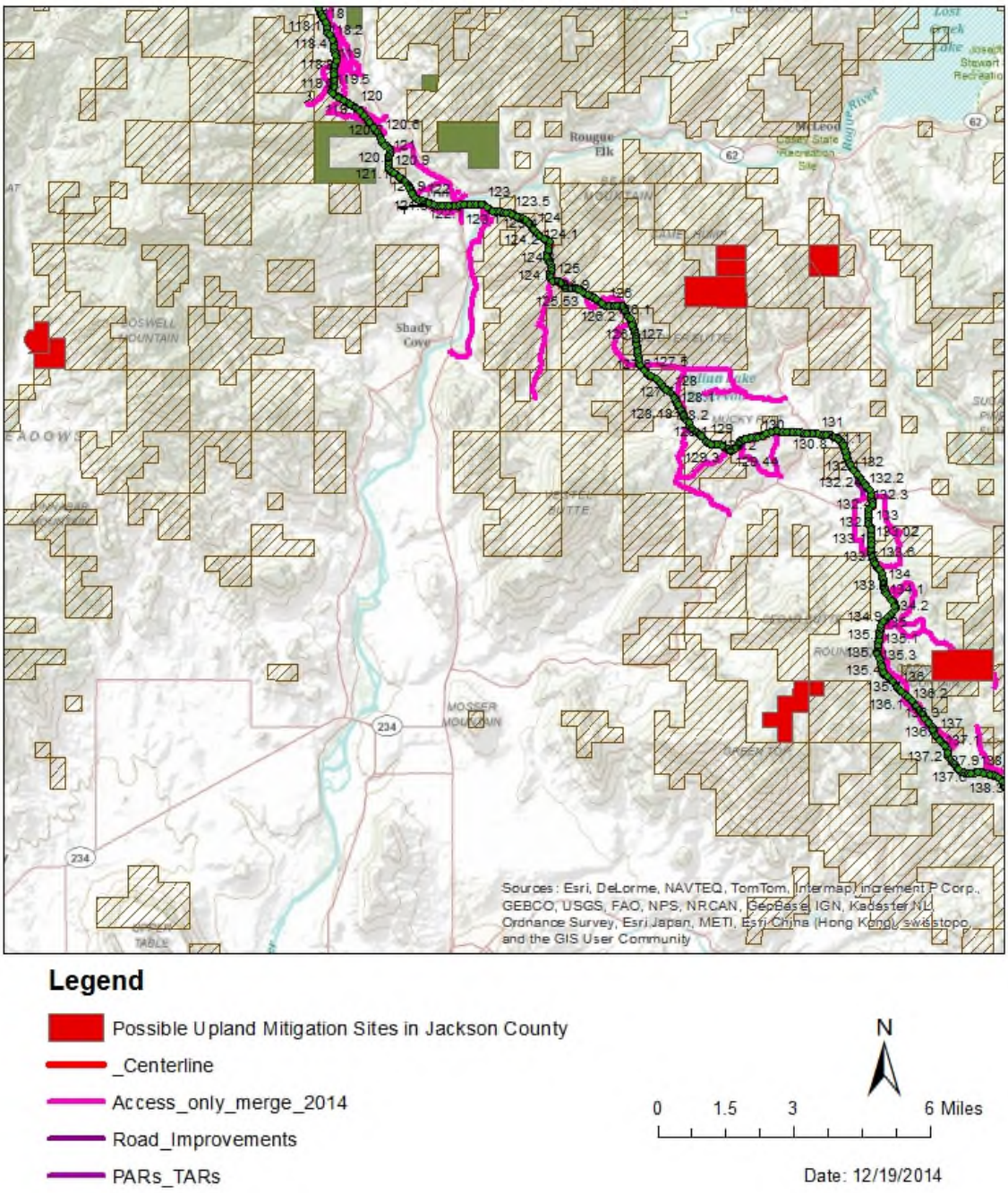

Figure 4. Mitigation sites in Jackson County in relation to the PCGP proposed route.

Table 4. Upland locations for proposed mitigation in Jackson County.

Property Block by TMA Unit	ROWD Priority	Map Nmbr.	FEEOWNER	INCAREOF	CITY	STATE	ACREAGE	TM_MAPLOT	SITEADD	VEG_NAME
Boswel Mtn.	1	8	MERIWETHER SOUTHERN OR	FOREST CAPITAL PARTNERS	INDEPENDENCE	OR	108.35	34-2W-16-500	EAST EVANS CR RD	Siskiyou-Sierra mixed conifer forest
Boswel Mtn.	2	1	MERIWETHER SOUTHERN OR	FOREST CAPITAL PARTNERS	INDEPENDENCE	OR	123.21	34-2W-16-900	EAST EVANS CR RD	Siskiyou-Sierra mixed conifer forest
Camel Hump B	3	4	MERIWETHER SOUTHERN OR	HANCOCK FOREST Mgmt.	VANCOUVER	WA	320	34-1E-1600	CROWFOOT RD	Siskiyou-Sierra mixed conifer forest
Camel Hump B	4	5	MERIWETHER SOUTHERN OR	HANCOCK FOREST Mgmt.	VANCOUVER	WA	80	34-1E-1500	CROWFOOT RD	Siskiyou-Sierra mixed conifer forest
Camel Hump B	5	3	MERIWETHER SOUTHERN OR	HANCOCK FOREST Mgmt.	VANCOUVER	WA	80	34-1E-1400	CROWFOOT RD	Siskiyou-Sierra mixed conifer forest
Camel Hump A	6	0	PLUM CREEK TIMBERLANDS LP		SEATTLE	WA	160.24	34-1E-10-900	CROWFOOT RD	Siskiyou-Sierra mixed conifer forest
Camel Hump A	6	0	PLUM CREEK TIMBERLAND		SEATTLE	WA	160.24	34-1E-10-900	CROWFOOT RD	Siskiyou mixed evergreen forest

			S LP							
Obench ain B	7	7	MERIWETHER SOUTHERN OR	HANCOCK FOREST Mgmt.	VANCOUVE R	WA	320	35-1E-5200	OBENCHAI N RD	Siskiyou-Sierra mixed conifer forest
Obench ain A	8	2	PLUM CREEK TIMBERLAND S LP		SEATTLE	WA	40	35-1E-6700	WORTHING TON RD	Siskiyou-Sierra mixed conifer forest
Obench ain A	9	6	PLUM CREEK TIMBERLAND S LP		SEATTLE	WA	240	35-1E-6800	WORTHING TON RD	Siskiyou-Sierra mixed conifer forest

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List 4. Information from ODA Noxious Weed Program identifying noxious weed issue locations.

Potential Noxious Weed Sites for Mitigation

due to Proposed Pipeline Installation

Locations submitted by Oregon Department of Agriculture's Noxious Weed Program on December 22, 2014 (Carri Pirosko)

FUNDING FOR WEED ERADICATION ON LANDS OWNED BY ODA'S PRIVATE PARTNERS WOULD NEED TO BE COORDINATED THROUGH ODA TO PROTECT PRIVACY.

Potential Noxious Weed Sites for Mitigation due to Proposed Pipeline Installation (Jackson County)

Garlic Mustard on the banks of the Rogue River from Kelly Slough down through the Wild and Scenic Section of the Rogue River

Dyer's woad along the I-5 corridor from the California/Oregon border, up and over the Siskiyou Summit, and to Exits into Ashland

Skeletonweed control along the I-5 corridor from the California/Oregon border to the Jackson/Josephine County line and into Douglas County.

Japanese knotweed along the banks of tributaries feeding into the Rogue River throughout Jackson, Josephine Counties.

Perennial pepper weed on the banks of Emigrant Lake.

Eurasian watermilfoil in the marina and sections of

Leafy spurge in the cities of Ashland and Medford.

Potential Noxious Weed Sites for Mitigation due to Proposed Pipeline Installation (Douglas County)

<u>Paterson's Curse</u>

Douglas County

10599 Old Highway 99, Dillard

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3845 Roberts Mountain Road, Myrtle Creek

Distaff thistle

Douglas County

Happy Valley Area

3203 Happy Valley Road, Roseburg

1200 Buell Lane, Roseburg

518 Buell Lane, Roseburg

520 Buell Lane, Roseburg

Metz Hill/Green Valley Area

331 Metz Hill Road, Oakland

1600 Metz Hill Road, Oakland

1601 Metz Hill Road, Oakland

2945 Metz Hill Road, Oakland

7888 Green Valley Road, Oakland

7275 Green Valley Road, Oakland

7279 Green Valley Road, Oakland

791 Scott Road, Oakland

Glide Area

16909 North Bank Road, Roseburg

16400 North Bank Road, Roseburg

16988 North Bank Road, Roseburg

297 Single Tree Lane, Roseburg

2589 Sunshine Road, Roseburg

LoneRock Timberland Co. Ranches, several properties in Glide area

Dixonville Area

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17047 Dixonville Road, Roseburg

15241, Dixonville Road, Roseburg

2126 S. Deer Creek Road, Roseburg

974 Brumbach Road, Roseburg

Myrtle Creek Area

3842 Roberts Mountain Road, Myrtle Creek

3845 Roberts Mountain Road, Myrtle Creek

4993 Clarks Branch Road, Roseburg

Umpqua Highway

10850 N. Umpqua Highway, Roseburg

17271 N. Umpqua Highway, Roseburg

10190 N. Umpqua Highway, Roseburg

Spurge laurel

Douglas County

Project location: (directions to the site)
I-5 South to exit 138/Oakland; I-5 South to Exit 136 turn left onto Central follow central to Waite St turn right follow Wait St down to stop sign turn right onto Southside Rd.

Project GPS, from heart of infestation:
Latitude: 24’45.01”N Longitude: 19’37.10”W - Spurge laurel

Japanese knotweed

Douglas County

Project location: (directions to the site)
Deer Creek: I-5 South to exit 124 turn right onto Harvard at light follow Harvard to Stephens follow Stephens to Diamond Lake BLVD turn right follow Diamond Lake BLVD out to Buckhorn RD. (Myrtle Cr.)
I-5 South to exit 109 – N. Old Pacific HWY, turn left on N.W. 4th Ave turn right onto Division St. stay on Division St. until you come to the North Myrtle/ South Myrtle “Y” take a left –North Myrtle Rd.

Project GPS, from heart of infestation:
Latitude: 12’37.53”N Longitude: 15’41.58”W – Japanese knotweed

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Portuguese broom

Douglas County

Project location: (directions to the site)
I-5 south Exit 159 on Anlauf Rd., to Cox Rd., then east to roads accessing the treatment area; or I-5 north exit 154, then west under freeway to Anlauf Rd., then north to Cox Rd.

Project GPS, from heart of infestation:
Latitude: 38’18.72”N Longitude: 11’25.89”W Portuguese broom

Gorse

Douglas County

Gorse- Scattered sites around Douglas County; Map available upon request.

Project GPS, from heart of one infestation:
Latitude: 23’48.94”N Longitude: 18’08.78”W Gorse

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Appendix B: ODFW Comment Related Supportive Figures, Tables, and Information.

(Including expanded comments on riparian concerns and recommendations)

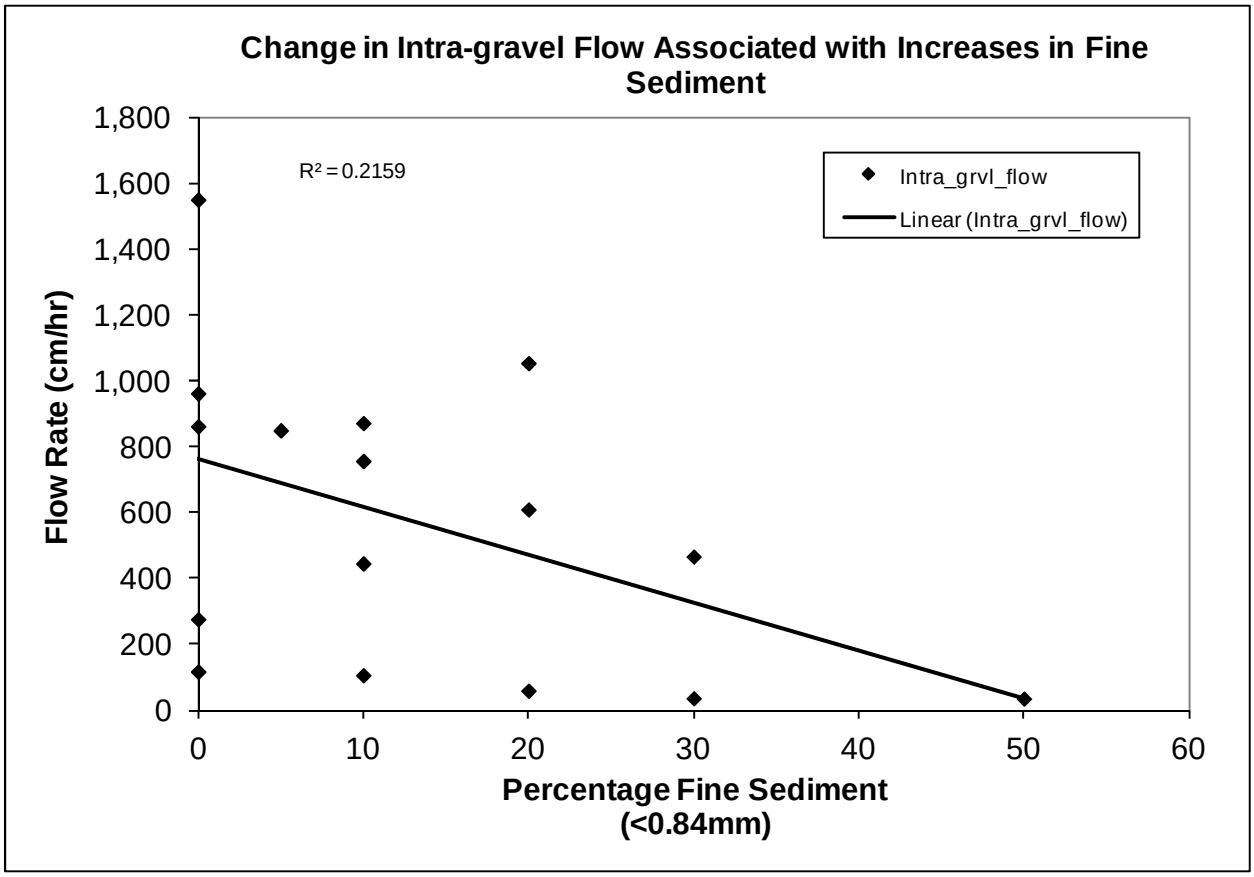

Figure 1. Change in intergravel flow of sediment Reiser and White 1988.

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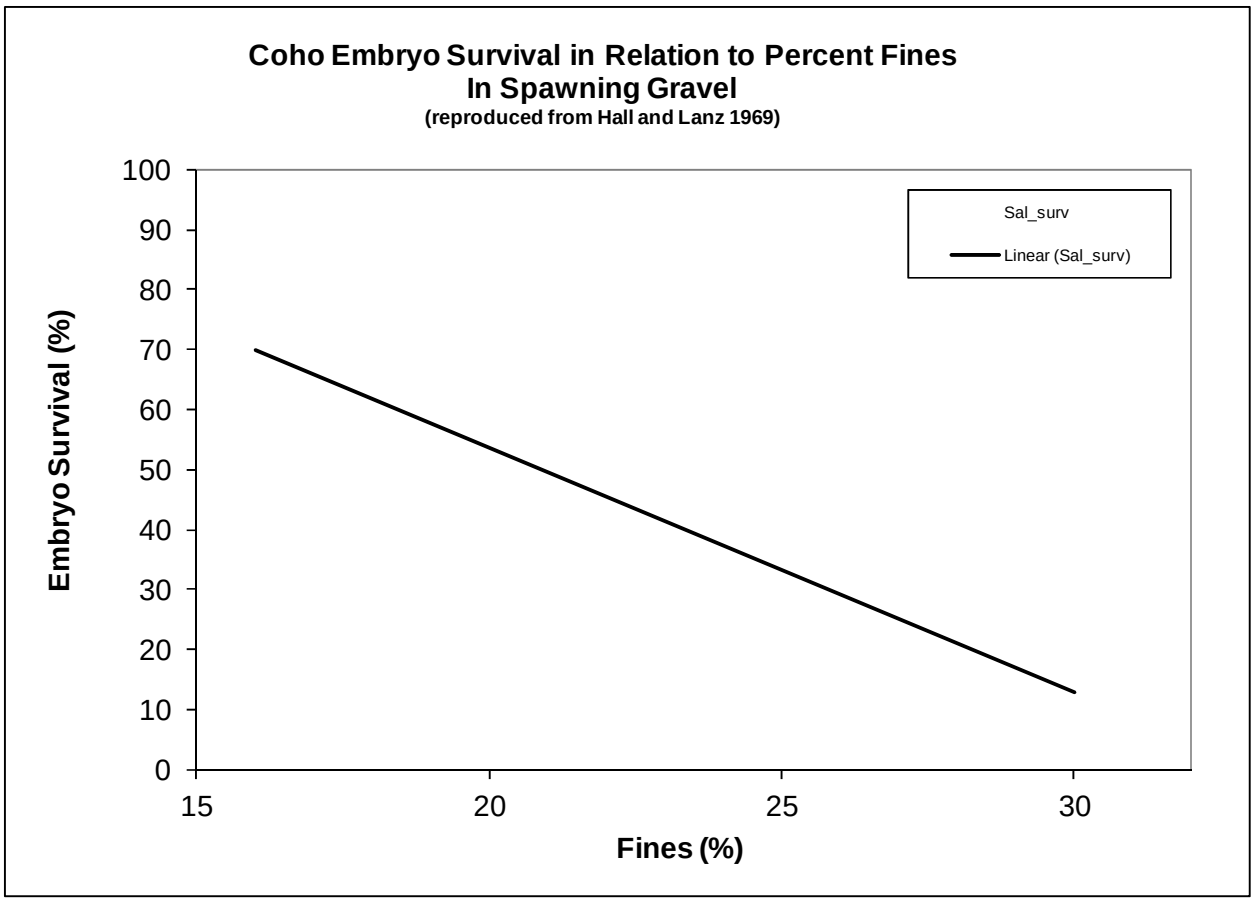

Figure 2. Coho embryo survival in relation to gravel embeddedness from Hall and Lanz 1969.

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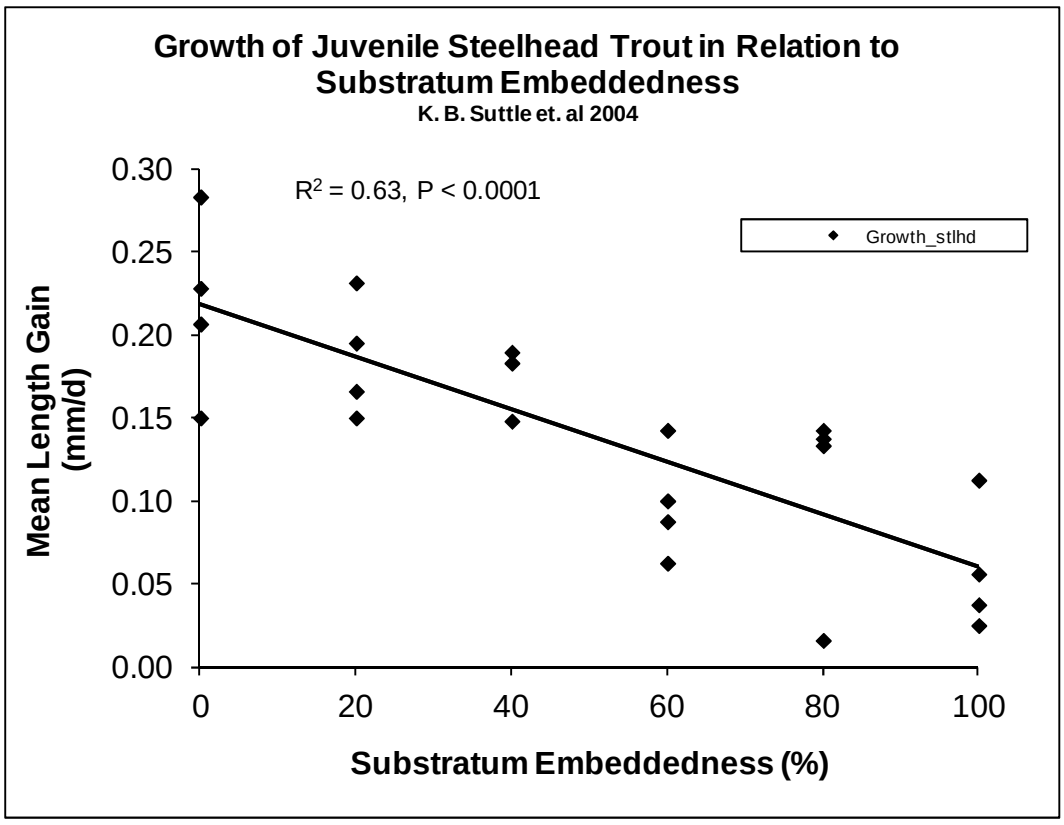

Figure 3. Growth of juvenile steelhead trout in relation to substrate embeddedness Suttle et. al 2004.

Table 2. Mean Monthly Flows 12/1/1905-9/30/2008 at Brockway Gauge (South Umpqua RM 138.7).

Mean, Minimum, and Maximum Flows in cfs, Sums in cfs·days

Month	# Values	Mean	Minimum	Maximum	Sum	Std Dev
1	77	6944	262	16000	534702.39	4215
2	77	6155	341	15400	473898.27	2953
3	77	4671	882	10900	359669.77	2354
4	77	3221	589	7380	247991.40	1491
5	77	1996	446	6910	153665.77	1184

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6	77	881	142	3310	67859.37	546
7	76	265	53	576	20151.45	120
8	76	136	40	392	10359.90	65.0
9	76	149	50	587	11321.80	82.2
10	75	448	103	6040	33581.20	730
11	75	2569	190	13600	192643.17	2477
12	76	5680	184	20000	431669.90	4506

Source: Oregon Water Resources Department Flow Data

Table 3. Mean Monthly Flows 10/1/1910-9/30/2008 at Tiller (South Umpqua RM 187). Mean, Minimum and Maximum Flows in cfs, Sums in cfs·days

Month	# Values	Mean	Minimum	Maximum	Sum	Std Dev
10	71	188	35	1790	13340.18	245
11	71	1009	48	3980	71615.09	833
12	71	2038	67	7480	144698.56	1601
1	70	2116	90	4720	148085.14	1229
2	70	1968	95	4910	137726.09	937
3	70	1721	328	4780	120453.25	855
4	70	1422	433	2760	99527.30	492
5	70	1079	231	2090	75517.93	491
6	70	511	108	1640	35747.39	302
7	70	152	49	301	10636.06	58.4
8	70	75.9	30	206	5315.52	26.8
9	70	73.0	39	364	5107.95	44.6

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Appendix B (Cont.): Expansion of riparian discussion from Department comments on the JCEP/PCGP DEIS**.**

Chapter 2.0 Table 2.1.5-1 Chapter 4.0; and Appendix F	**Riparian Habitat Impacts:** A. Riparian vegetation within the Riparian Management Area (RMA) zone near streams, wetlands, and waterways is critically important for the health of Oregon's native fish populations, especially in the drier parts of the pipeline corridor such as the Rogue and Klamath watersheds. Fish in the state are predominantly cold-water species that evolved in stream conditions that were generally in most cased related to climax or second growth hardwood and conifer forest, thus near maximum shade that the stand would produce. Oregon Dept. of Environmental Quality has identified 303d temperature listed streams including numerous streams through the pipeline route. These listings relate directly to removal of riparian	**Riparian Habitat Impacts:** A. The Department recommends for riparian vegetation: • RMA vegetation meet or exceed State and local government requirements be implemented on non-federal lands. All disturbed areas need to be replanted with native vegetation. The department recognizes that the proposed crossing locations may be on lands where private landowners may not allow the full setback to be replanted. In these situations, the Department does not object if mitigation for permanent riparian impacts occurs off-site provided that it occurs within proximity within the same HUC 6 watershed and on private lands. *(Note: The department recognizes recommendation in this section may not be possible).* Riparian ordinances in Coos and Douglas counties have been defined as a 50ft. minimum setback. Where the pipeline is adjacent to a stream corridor, the department recommends that riparian hardwood native vegetation be replanted and allowed to regenerate from the OHW mark to a distance of 50ft. minimum upslope in the pipeline corridor. The Department recommends: • Plants should include a minimum of at least 3 shrub species and 2 hardwood and 2 conifer tree species native to the location. • Plants should be installed from bare root or preferred 1 gallon or 2 gallon stock from a genetic source within 60 air miles and 1000ft. of elevation of the site. • Planting spacing should be 3ft. maximum and

	vegetation since the 1800's. The department notes that PCGP staff have developed a water temperature model to evaluate the impacts of the project at specific stream crossings. Chapter 4.3 identifies through modeling efforts that some streams impacted by the PCGP will be cooler following removal of the riparian corridor, which is not scientifically logical. • OC Coho salmon production across the pipeline route has been significantly deleteriously impacted by historical removal of vegetation from the RMA. Further impacts are considered as highly negative for this species as well as Fall Chinook Salmon, winter steelhead, and Coastal Cutthroat Trout. • The DEIS identifies extensive measures on federal lands where RMA's are currently considered in "Good" condition to further improve these stands. These measures are noted by the Department, but will fully fail to address damage to RMA's on private lands. • B. The Department has repeatedly raised concerns over inadequacy of	continue upslope. • *(Note: The Department recognizes the need for the pipeline to maintain a maintenance corridor. Accordingly, the above recommendations in A. are likely not feasible and in lieu of on site mitigation off-site mitigation is recommended such .* B. The Department recommends coordination with Department staff to develop Riparian Mitigation off-set mitigation (see comments below). <u>Note:</u> *In Jackson County, the riparian setback for all streams except the Rogue River is 50 feet from the ordinary high water level; the setback on the Rogue is 75 feet. As part of its review process for land use actions, Jackson County typically requires applicants to fill out a Riparian Landscape Plan showing how the proposed project will mitigate for unavoidable impacts to riparian areas. These plans must be reviewed and approved by the department before the County will accept them. Planting measures should be the same as section A.* <u>C. If the Applicant is unable to ensure the recommendations above in A and B</u>, The Department recommends the 30-foot wide area centered on the pipeline where the current proposal is to allow no trees taller than 15 feet be allowed to grow; as there will be a 30-foot wide area which will be maintained in an herbaceous state that provides very limited RMA function. The maintenance corridor will alter the vegetation in riparian areas for the life of the project and should require mitigation. Pacific Connector should calculate the amount of permanent impact from this loss of vegetation using the local riparian setback ordinances and be required to provide mitigation accordingly. Most riparian habitats will be considered Habitat Category 2 or 3 under the department Habitat Mitigation policy. In order to meet a "Net Benefit" through habitat restoration, the

	proposed riparian vegetation buffers for the PCGP on non-federal land. The proposed 25-foot replanting zones on private and state lands are not consistent with county or state requirements for riparian areas which may also vary depending on specific location within state and private forest lands. Agreed riparian buffers on federal land are 100 ft. minimum. For example, Douglas County Land Use and Development Ordinance (LUDO) requires the department to complete an inspection for any land use action that will affect the Riparian Vegetation Corridor. Other counties that the pipeline passes through have similar riparian vegetation-related ordinances. The Douglas County ordinance requires the Department to grant approval to reduce the setback or, if that is not possible, there is an appeals process through the county planners. C. Providing shade to streams is a critically important function of riparian areas, but there are many other functions. Healthy riparian areas contribute wood to streams which create habitat for	D. <u>Thinning as Mitigation:</u> The department recommends: • This treatment be used only on a very limited basis if at all. • This type of treatment only be used in subbasins where no stream or downstream reach of a connected stream is considered 303d listed. <u>Additional Riparian Recommendations:</u> The department recommends revisiting analysis and discussion of the following specific riparian impacts/mitigation components of the 2009 project FEIS: Revisit the sufficiency of the Compensatory Mitigation Plan (CMP) to fully mitigate project impacts. The CMP which was developed in close consultation with the USFS and other federal agencies and has been considered by the applicant to be sufficient to mitigate for impacts to federal and private lands. The department does not concur with the above conclusion. • The vast majority of proposed mitigation will occur on Federal lands whereas impacts to habitats will occur across Federal, State, and private ownerships creating an inequitable disparity between impact site and mitigation site location. According to the DEIS, a total of 90.7 acres of various types of riparian vegetation will be removed within riparian zones on federal property with additional acres on private ownership that are within watersheds that provide critical habitat for either Oregon Coast (OC) and Southern Oregon/Northern California Coast (SONCC) coho salmon. Most of this habitat (70%) is on private land. The CMP focuses on a late successional and mid-seral forest subset within the lost riparian

	fish and slow down stream flows during storms. Plant roots hold the soil in place which helps to prevent erosion. Riparian vegetation filters runoff reducing the amount of sediment and pollutants that enter the stream. Many terrestrial wildlife species rely on riparian vegetation for food, shelter, and migration corridors. D. <u>Thinning as Mitigation:</u> The DEIS notes in TABLE Table 2.1.5-1 and other locations thinning of the riparian forest as mitigation. The department recognizes that this treatment will produce harvest revenue, however, assuming that this treatment is aimed at producing greater growth through reducing stock densities, the department considers this treatment experimental and unlikely to yield benefits for fishery resources on medium and small streams as: • Due to existing stream protection buffers on federal lands most stands timber near streams are >60yrs. in age. Individual trees in these stands largely have attributes (sufficient size and	vegetation habitat. Most of this habitat (63%) is on private land. Yet, nearly the entire menu of mitigation for these impacts occurs on public land. Throughout project reviews, the department has recommended that mitigation occur on private lands where it may not occur otherwise. • The Department recommends further consideration of mitigation options on non-federal lands in order to achieve mitigation site locations commensurate to impact site locations. • The Department recommends that mitigation proposals should be expanded for impacts to fish species in addition to late successional and mid-seral forest riparian habitat across the pipeline route including the range of both OC and SONCC coho salmon. The proposed project would result in a loss of function of other riparian habitat types due to a lack of adequate proposed mitigation. The Department recommends other priorities for mitigation in addition to large wood. These include, but are not limited to: • Purchase of in-stream water rights from willing sellers • Protection of riparian habitat on private land (purchases or easements from willing sellers), • Restoration of fish passage, and • Restoration of riparian habitat such as fencing and planting, non-native vegetation control, etc. (multi-year projects) See Appendix B in this document. FERC's staff has previously recommended that PCGP develop a stream mitigation plan. The department has previously requested this as well. • The Department recommends that the applicant complete a stream, riparian, wetland, and upland mitigation plan for all

	height) to provide good-excellent LWD for small streams and fair-good for smaller medium sized streams. • A number of small tributaries where treatments are proposed feed into larger tributaries that are 303d listed for temperature. If a particular stand is providing maximum shading overstocked and thinning will reduce shading there becomes a need for discussion to determine "Limiting Factors" for salmonids by individual watershed prior to thinning treatment. Increasing water temperature at time zero in the context of increasing LWD 100-200yrs. in the future fails to meet ecological objectives. • Thinning of overstocked stands decreases tree mortality, improves growth rates, and theoretically extends the life expectancy of trees. Overstocked stands have more disease issues and greater mortality, thus contributing more snag habitat and large wood to streams in upcoming years, while allowing	impacts (on federal and non-federal lands), which is acceptable to state and federal natural resource agencies and approved by the department prior to FERC authorization of this project. The Department notes that proposed mitigation measures in the CMP are likely not adequate. Each of these stream crossings will need to be assessed during a site visit with a department biologist to assess project-related impacts. These site visits will be used to determine: • The Department anticipates that the applicant will use all measures available to determine fish distribution, however, in the rare instance that there remains uncertainty concerning fish use of a stream department staff will need to assist with historic and present fish presence/absence if unknown and species expected to be present. • Individual Habitat Categorization under the department Habitat Mitigation Policy and to assist the project proponents in determining suitable mitigation to offset those • The Department strongly objects to the Environmental Investigator (EI) determining mitigation needs during implementation as described in the FERC Wetland and Waterbody Construction and Mitigation Procedures. Site specific impacts will need to be assessed at each stream or river crossing to determine mitigation needs for each unique site based on the department Fish and Wildlife Habitat Mitigation Policy.

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	remaining trees to continue to grow. • There is no existing dataset documenting from time zero through to 200-300yrs. when it could be determined if the original treatment produced greater quantity of large wood for stream complexity.	

Oregon
Kate Brown, Governor

Department of Environmental Quality
Western Region Eugene Office
165 East 7th Avenue, Suite 100
Eugene, OR 97401
(541) 686-7838
FAX (541) 686-7551
TTY 711

May 6, 2019

VIA EMAIL, CERTIFIED MAIL, AND U.S. FIRST CLASS MAIL

Derik Vowels
Jordan Cove LNG, LLC
Pacific Connector Gas Pipeline, LP
111 SW 5th Ave., Suite1100
Portland, OR 97204

and

Jordan Cove LNG, LLC
Pacific Connector Gas Pipeline, LP
5615 Kirby, Suite 500
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Tyler Krug, Regulatory Project Manager
North Bend Field Office, Portland District
United States Army Corps of Engineers
2201 N. Broadway Suite C
North Bend, Oregon 97459

Ms. Kimberly D. Bose,
Secretary
Federal Energy Regulatory Commission
888 First St., N.E., Room 1A
Washington, D.C. 20426
FERC Dockets No. CP17-494, CP17-495

Dear Mr.Vowels, Mr. Krug and Ms. Bose:

On October 24, 2017, the U.S. Army Corps of Engineers (Corps) notified the Oregon Department of Environmental Quality (DEQ) that it had received an application from Jordan Cove LNG LLC and Pacific Connector Gas Pipeline LP, (herein collectively referred to as "Jordan Cove" or the "Applicant") for Section 404 (Clean Water Act, or CWA) and Section 10 and 14 (Rivers and Harbors Act) permits related to construction and operation of LNG facilities and an associated pipeline (collectively, the "Project"). Consistent with its regulations, the Corps

determined that the initial application of October 24, 2017 was incomplete on November 3, 2017. Consistent with Corps regulations, the Corps requested additional information from November 2017 through May 2018 before the Corps determined it had received a complete application and issued a public notice on May 22, 2018, which commenced DEQ's water quality certification (401 WQC) review pursuant to CWA Section 401.

The proposed Project consists of two interconnected parts. The 200-acre Jordan Cove LNG Export Terminal would be located in Coos County, Oregon on the North Spit of Coos Bay. The facility would include a slip and access channel, modifications to the federal navigational channel, a marine terminal, a natural gas conditioning and liquefaction facility, temporary workforce housing, security and safety buildings, and wetland mitigation sites. The Pacific Connector gas pipeline is the second part of the Project, consisting of a 229-mile 36-inch diameter pipeline and associated roadways and work areas, extending from the terminal to interconnections with existing pipelines near Malin, Oregon. The Jordan Cove terminal would receive up to 1.2 billion cubic feet per day of natural gas from the Pacific Connector gas pipeline.

DEQ has evaluated the Project application pursuant to Section 401 of the Clean Water Act, 33 USC §1341, ORS 468B.035 through 468B.047, and DEQ's certification rules found in Oregon Administrative Rules 340, Division 048. To certify the Project, DEQ must have reasonable assurance that the proposed activities will be conducted in a manner that will not violate the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, and Oregon water quality standards in Oregon Administrative Rules 340, Division 041, adopted to implement these sections.

Following a preliminary review of the Project, DEQ filed a request for additional information with Jordan Cove on September 7, 2018. Jordan Cove filed responses on October 8, 2018. However, because many of the responses were incomplete or inadequate, the Department filed a supplemental information request with Jordan Cove on December 20, 2018. That request included examples of the information sought. Jordan Cove responded, in part, on January 22, February 20, and April 16, 2019, and committed to filing complete responses by the end of April 2019. DEQ filed additional requests for project information on September 25, 2018, and March 11 and 13, 2019. Jordan Cove filed a response to these requests on April 30, 2019; however, the late date of Jordan Cove's filing prevented any significant review of the material for this decision. OAR 340-048-0020(3).

On March 29, 2019, DEQ reviewed the FAST-41 Coordinated Project Plan for the Project. DEQ notes that the Corps has indicated that JCEP is considering pipeline route changes, and that the Corps intends to issue a revised public notice once it receives sufficient information regarding the changes. DEQ has not yet received information from Jordan Cove regarding these changes to the proposed Project.

DEQ denies Jordan Cove's request for 401 WQC for the Project. DEQ does not have a reasonable assurance that the construction and operation of the Project will comply with applicable Oregon water quality standards, as described in the attached Evaluation and Findings Report, which is incorporated in its entirety by this reference. DEQ's decision, however, is made without prejudice. Jordan Cove may reapply for 401 WQC for the Project, and DEQ will consider additional information that is responsive to the bases for denial in this decision.

In accordance with the Oregon Administrative Procedures Act (Oregon Revised Statute, chapter 183) and OAR 340-048-0045(2), Jordan Cove may request a contested case hearing if dissatisfied with the certification decision. Your request for a hearing must be made in writing to and received by the Department of Environmental Quality within 20 days of the date of mailing of this certification decision, and such request must comply with OAR 340-011-0530(2) and OAR 340-048-0045(2).

A request for a hearing must be mailed to:

Oregon Department of Environmental Quality
Attn: Chris Stine
165 East Seventh Avenue, Suite 100
Eugene, Oregon 97401

If a request for hearing is not received within this 20-day period, your right to a hearing will be considered waived. If you request a hearing, you will be notified of the time and place of the hearing and provided information on the procedures by which contested cases are heard, your rights, the import and effect of such a hearing, and your rights and remedies.

Contested cases are governed by the rules of the Office of Administrative Hearings, specifically OAR 137-003-0501 through -0700. As a corporation, you must be represented by legal counsel at this hearing, if any.

In accordance with OAR 340-048-0045(3), this certification decision is effective upon issuance of this decision, notwithstanding a request for a contested case or other judicial review, if any.

As noted above, this decision is being made without prejudice. Jordan Cove may resubmit an application for 401 WQC with DEQ. If Jordan Cove does so, DEQ strongly recommends that Jordan Cove, the Corps and DEQ hold a pre-application conference to ensure a shared understanding of the information and actions required to complete a subsequent review of an application in a timely manner that would avoid delays in consideration of the application by DEQ, and that is coordinated with both the Corps and the FAST-41 Project Plan being managed by the Federal Energy Regulatory Commission. DEQ also requests that if it does resubmit an application, Jordan Cove clearly indicate in such a submittal whether the applicant is seeking certification for purposes of the permits and licenses for the Project pending before both FERC and the Corps.

If you have any questions, please contact Chris Stine at stine.chris@deq.state,or.us or at (541) 686-7810 or at the address on this letterhead.

Sincerely,

Richard Whitman
Director
Oregon Department of Environmental Quality

Attachment: Evaluation and Findings Report

cc: Ms. Natalie Eades, Jordan Cove LNG
Mr. Mike Koski, Jordan Cove LNG,
Ms. Rose Haddon, Jordan Cove LNG
Mr. Bill Abadie, US Army Corp of Engineers
Mr. Sean Mole, Oregon Department of Energy
Mr. Jim Rue, Oregon Department of Land Conservation and Development
Mr. Keith Andersen, DEQ
Mr. David Belyea, DEQ
Mr. Chris Stine, DEQ
FERC Dockets No. CP17-494, CP17-495
DEQ (file)

NOTICE TO ACTIVE DUTY SERVICEMEMBERS

Active duty Service members have a right to stay these proceedings under the federal Servicemembers Civil Relief Act. For more information contact the Oregon State Bar at 800-452-8260, the Oregon Military Department at 503-584-3571 or the nearest United States Armed Forces Legal Assistance Office through http://legalassistance.law.af.mil. The Oregon Military Department does not have a toll free telephone number.

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Evaluation and Findings Report

Section 401 Water Quality Certification for the Jordan Cove Energy Project

Oregon Department of Environmental Quality
May 2019

Water Quality Division
165 E. 7th Ave
Suite 100
Eugene, OR 97401
Phone: 541-686-7838
800-452-4011
Fax: 541-686-7551
Contact: Christopher Stine
www.oregon.gov/DEQ

DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

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This report prepared by:

Oregon Department of Environmental Quality
165 E. 7th Ave. Suite 100
Eugene, OR 97401
1-800-452-4011
www.oregon.gov/deq

Contact:
Christopher Stine
541-686-7810

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.

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Attachments

Attachment A: DEQ Additional Information Requests

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1.0 Introduction

1.1 Background

On October 24, 2017, the U.S. Army Corps of Engineers (Corps) notified the Oregon Department of Environmental Quality (DEQ) that it had received an application from Jordan Cove LNG LLC and Pacific Connector Gas Pipeline LP, (herein referred to collectively as "JCEP" "Applicant" or "Jordan Cove")JCEP for Section 404 (Clean Water Act, or CWA) and Section 10 and 14 (Rivers and Harbors Act) permits related to construction and operation of LNG facilities and an associated pipeline (collectively, the "Project"). Consistent with its regulations, the Corps determined that the initial application of October 24, 2017, was incomplete on November 3, 2017. 33 CFRR 325.1. The Corps requested additional information from JCEP on November 2017 through May 2018.

JCEP submitted additional information to the Corps on May 8, 2018. Within 15 days of receiving such information from JCEP, the Corps determined it had received a complete application, and issued a public notice on May 22, 2018 (hereinafter referred to as "the Public Notice"). Per DEQ's usual procedure regarding Corps' permit applications, DEQ treated receipt of the Public Notice as receipt of a request for water quality certification under CWA Section 401 ("WQC") for the project pursuant to OAR 340-048-0032. The Public Notice included DEQ's notice of an application for WQC, and commenced the public comment period for the Corps' section 404/10-14 permits application and DEQ's WQC. Thus, DEQ's 401 WQC review process began on May 22, 2018. The Public Notice did not specify the applicable time period for DEQ's certification review; therefore, on June 22, 2018, DEQ sent a request to the Corps for additional time to complete its water quality certification review based upon the specific factual circumstances. 33 CFR 325.2(b)(1)(ii). The Corps responded to DEQ on July 3, 2018, and consistent with its regulations, indicated that DEQ had until May 7, 2019, to act on JCEP's certification request.[1]

1.2 Additional Information Requests

Pursuant to OAR 340-048-0032(2), DEQ made a number of formal additional information requests ("AIRs") to JCEP, see Attachment A. A brief chronology of DEQ requests and JCEP responses is described below, including the supplemental response to the 9/7/18 request that identifies where JCEP's responses were deemed insufficient.

AIR-1: September 7, 2018
Subject: Minimum 401 application and decision requirements per OAR 340-048-0020 & OAR 340-048-0042.

October 8, 2018: Jordan Cove files response.

December 20, 2018: DEQ files supplemental information request providing examples of deficiencies in October 8, 2018 response.

January 22, 2019: Jordan Cove asserted that DEQ's requests were overbroad and onerous, and requested meeting with senior management and legal representatives. During this meeting, DEQ explained that the

[1] Letter from Colonel Aaron Dorf, Corps, to Richard Whitman, DEQ (July 3, 2018). DEQ notes that it also communicated to JCEP its intent to deny water quality certification prior to October 22, 2018, due to the lack of reasonable assurance of the Project's compliance with water quality standards, noting deficiencies in the application and outstanding additional information requests. At that time, JCEP indicated that such responses were forthcoming and, of its own volition, withdrew its then pending request for 401 certification with DEQ on September 25, 2018, and resubmitted a new 401 certification request for the Corps permits that same day. See Letter from Tony Diocee, JCEP to Mary Camarata et. al, DEQ, at 1 (Sept. 25, 2018).

requested information is directly related to specific provisions of the agency's rules for water quality certifications, and that the requested information is consistent with information provided by other large pipeline developers including, most recently, the Ruby pipeline. OAR 340-048-0032, -0020. In many cases, the requested information is necessary for DEQ to determine whether proposed construction methods represent the highest and best practicable treatment and/or control of wastes, activities, and flows – a central narrative water quality criterion. In other cases, particularly where the affected waterbody is water quality limited, any new discharge may be allowed only if the proponent demonstrates that the discharge would not adversely affect the water quality impairment or is allowed under a TMDL implementation plan. This requires some level of site-specific evaluation corresponding to the specific activity proposed and the condition of the waterbody. The JCEP has continued to rely on standard FERC prescriptions and suggest that DEQ use its authority to condition a certification. The problem with this approach is that it presumes that conditions would always succeed in meeting standards. DEQ requires enough information to make an informed judgement before taking such a course JCEP.

February 20, 2019: Jordan Cove files partial response to September 7, 2018 request. Commits to filing remaining material within two months.

April 16, 2019: Jordan Cove files partial response to the December 20, 2018 request.

AIR-2: September 25, 2018
Subject: Post-construction stormwater plan for Jordan Cove Terminal.

October 25, 2018: Jordan Cove files partial response.

April 1, 2019: Jordan Cove files revised stormwater plan in response to September 25, 2018 information request.

AIR-3: March 11, 2019
Subject: Requests information on selection of particular waterbody crossing methods for particular crossings, and for baseline environmental conditions for site-specific stream restoration plans. The JCEP was not able to compile and submit the information requested in time for DEQ to evaluate it before making a 401 WQC decision.

AIR-4: **March 13, 2019**
Subject: Land Use Compatibility.

April 30, 2019: Jordan Cove files a response to prior DEQ requests for information. The JCEP did not submit the information requested with adequate time for DEQ to evaluate it before making a 401 WQC decision.

On March 29, 2019, DEQ reviewed the FAST-41 Coordinated Project Plan for the Project and notes that the Corps has indicated that JCEP has changed the project scope and that the Corps intends to revise the public notice once it receives information in sufficient detail. DEQ notes that if JCEP resubmits an application to DEQ for WQC, and the project scope has changed to include the Blue Ridge Variation,[2] it would need to provide the same information to DEQ for its review.

1.3 Public Comment Period

The Corps' and DEQ's public comment period for the Project were originally set to close on July 21, 2018. The agencies extended the public comment period with a new comment close date of August 20, 2018. DEQ

[2] The Blue Ridge Variation would increase the number of perennial waterbodies crossed by the pipeline by 27. FERC DEIS at 3-20.

received about 42,000 public comments electronically and by mail.

This Evaluation and Findings Report does not include responses to these public comments because DEQ is denying certification JCEP. Therefore, a response to public comments has not been prepared.

1.4 WQC Decision

DEQ has prepared this Evaluation and Findings Report supporting the attached 401 Water Quality Certification decision (the DEQ WQC Decision) for the Corps' issuance of CWA Section 404 and RHA Section 10 permits pursuant to Section 401 of the Clean Water Act (33 U.S.C. Section 1431), Oregon Revised Statutes (ORS) chapter 468B) and OAR 340 Division 48, other water quality related requirements of state law, and in consideration of all public comments received relevant to water quality and beneficial use concerns. As described in the DEQ WQC Decision, DEQ denies the requested certification because it does not have a reasonable assurance that the construction and operation of the Project would comply with applicable state water quality standards. DEQ's decision, however, is made without prejudice. Jordan Cove may reapply for 401 WQC for the Project, and DEQ would consider additional information that is responsive to the bases for denial in this decision.

DEQ notes that it has not received an application for WQC for issuance of a FERC permit or license associated with the Project. DEQ did receive information relevant to JCEP's applications to the Corps for Section 404/10 permits on February 6, 2018; May 21, 2018; November 21, 2018; March 19, 2019 and April 30, 2019. However, to the extent there was any ambiguity as to the nature of the materials received by DEQ on February 6, 2018 (specifically, whether that submittal constituted a separate request to DEQ for WQC for any FERC authorization or was a supplement to materials for the Corps' review) JCEP confirmed in correspondence on December 7, 2018, that the February 6, 2018 materials were supplements to its application to the Corps for Section 404 and Section 10 permits. Additionally, contrary to JCEP's assertion in its December 7, 2018, letter to DEQ that JCEP had submitted to DEQ a 401 WQC application on October 22, 2017, no record supports this assertion. The only materials DEQ received regarding the Project in October of 2017 were emailed notices from the Corps on October 23, 2017 and October 24, 2017 of the Corps' receipt of Section 404/10 permit application materials from JCEP. As described above, the Corps deemed that application incomplete (33 CFR 325.2(a)). As a result, in accordance with DEQ's rule (OAR 340-048-0032(1)) DEQ did not receive a 401 WQC application from JCEP for the Corps' permits until the Corps determined JCEP's application constituted a valid request for certification and issued the Public Notice on May 22, 2018, pursuant to Corps regulations. See 33 CFR 325.2(b)(1)(ii). In the event that JCEP resubmits an application to DEQ for certification, DEQ requests that JCEP expressly state whether the application is for certification for pending FERC authorizations under the Natural Gas Act as well as the pending Corps Section 404/10 permits.[3]

2.0 Summary of Application

Section 401(a) of the Clean Water Act, 33 U.S.C. § 1341(a), requires an applicant for "a Federal license or permit to conduct any activity which may result in a discharge into the navigable waters" to provide the federal licensing or permitting agency a certification from the relevant state that the discharge would comply with applicable provisions of sections 1311, 1312, 1313, 1316, and 1317 of the Clean Water Act.

[3] At this time, DEQ is not aware of any reason why review of a new certification request would require additional time as a result of including both the Corps permits and the proposed FERC authorizations.

2.1 Legal Name of Applicant

Jordan Cove LNG, LLC
Pacific Connector Gas Pipeline, LP
5615 Kirby, Suite 500
Houston, TX 77005

2.2 Description of Project Location

2.2.1 Jordan Cove LNG Export Terminal

The Jordan Cove LNG Export Terminal and associated facilities are proposed be located primarily on the bay side of the North Spit of Coos Bay in southwest Oregon in Section 5 of Township 25 South, Range 13 West at Latitude/Longitude: 43.432238°, -124.267136°. The primary site for the LNG Terminal is about 7.5 miles up the existing Coos Bay Federal Navigation Channel, approximately 1,000 feet north of the city limit of North Bend, in Coos County, Oregon, and more than one mile away from the nearest residence. Figure 1 presents a site plan of the proposed LNG Export Terminal.

2.2.2 Pacific Connector Gas Pipeline

The Pacific Connector gas pipeline would extend for about 229 miles across Klamath, Jackson, Douglas, and Coos Counties, Oregon and terminate at the proposed Jordan Cove LNG Export Terminal in Coos County. Figure 2illustrates the proposed alignment of the Pacific Connector gas pipeline. The pipeline would occupy 4,947.7 acres of land during construction and 1,398.57 acres of land as part of a permanent easement.

2.3 Adjacent Landowners

A list of landowners adjacent to the Jordan Cove LNG Export Facility is provided in Attachment K to the Section 404/10 application to the Corps and is incorporated here by reference.

Jordan Cove seeks to negotiate agreements with private, non-federal landowners to occupy lands necessary for temporary and permanent pipeline easements. Jordan Cove would also apply for Right-of-Way Grants with Federal land agencies to construct and operate the pipeline on federally owned lands.

2.4 Description of Activity

Jordan Cove Energy Project, LP is seeking to site, construct, and operate a natural gas liquefaction and liquefied natural gas export facility to be located on the bay side of the North Spit of Coos Bay, Oregon. To supply the LNG Terminal with natural gas, Pacific Connector Gas Pipeline, LP is proposing to construct and operate a new, approximately 229-mile-long natural gas transmission pipeline and compressor station from interconnections with the existing Ruby Pipeline LLC and Gas Transmission Northwest LLC (“GTN”) systems to the LNG Terminal.

The Project is described more fully in section three of this report, and in the Section 404/10 Application to the Army Corps of Engineers (NWP-2017-041), which is incorporated into this section by reference.

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Figure 1: Jordan Cove LNG Export Facility

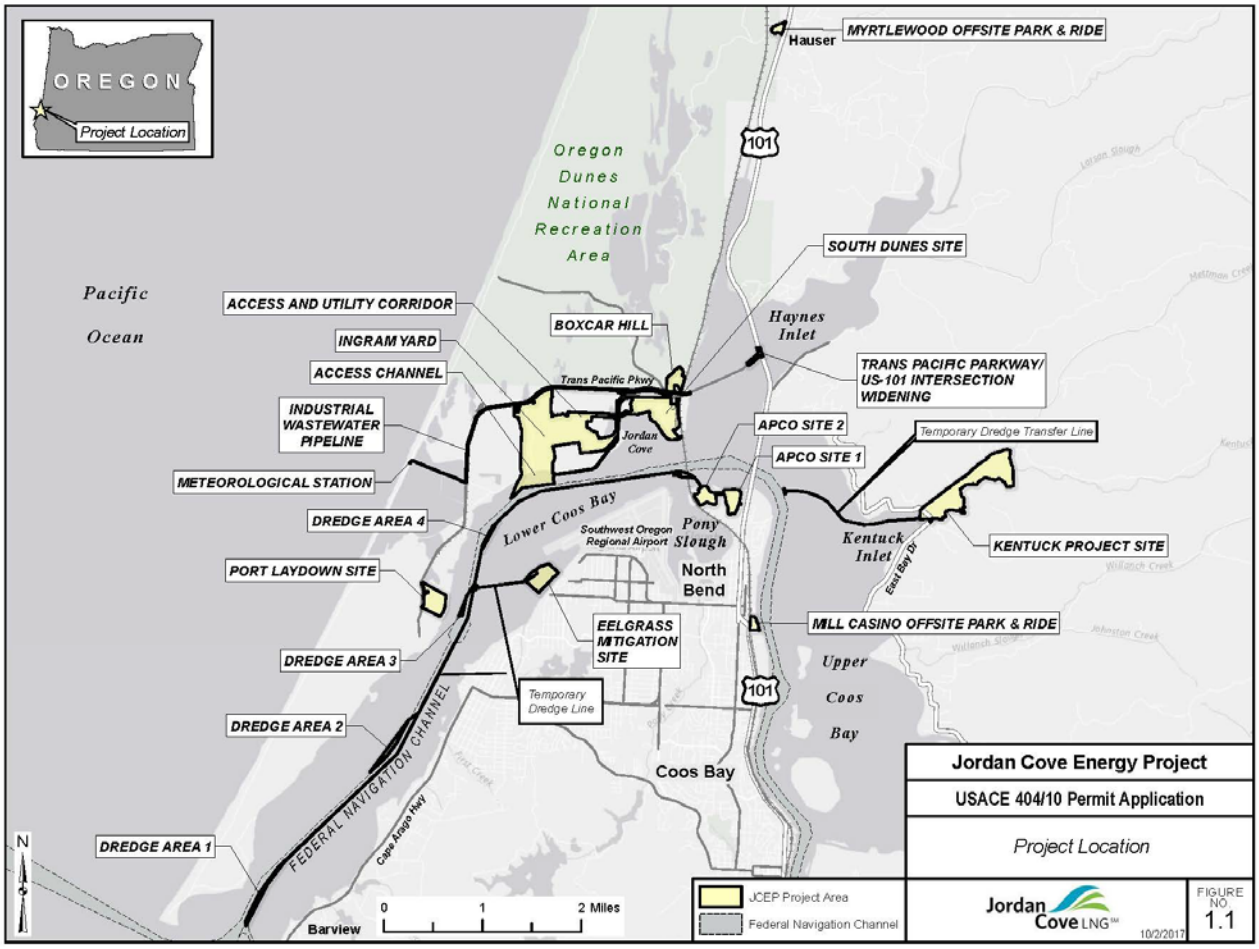
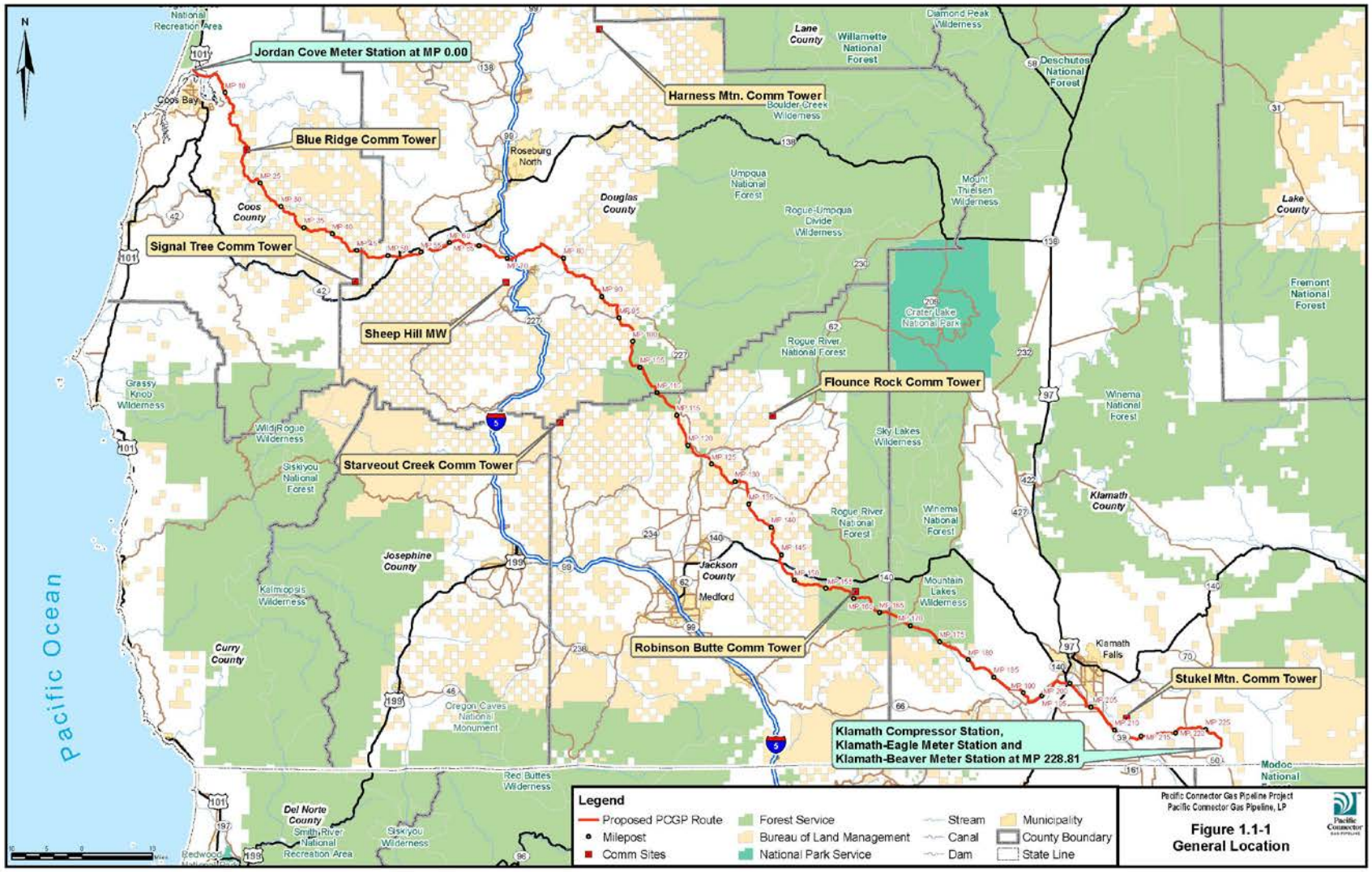


Figure 2: Pacific Connector Pipeline Alignment



2.5 Waters of the State Affected by the Project

2.5.1 Water Resources Affected by the Jordan Cove LNG Facility

Construction and operation of the Jordan Cove LNG Export Terminal would result in the temporary and permanent loss of estuarine and freshwater wetlands as well as alterations to those wetlands. In addition, the construction and operation of the Export Terminal would affect the Coos Bay estuary. A comprehensive accounting of wetland and water resources affected by the proposed action is presented in Section 6 of the Section 404/10 application to the US Army Corps of Engineers (NWP-2017-041).

2.5.2 Water Resources Affected by the Pacific Connector Gas Pipeline

Basins and watersheds affected by the proposed Pacific Connector gas pipeline are summarized in Table 1, below. The proposed pipeline would cross approximately 352 waterbodies (not including wetlands).

Table 1: Subbasins and Watersheds Crossed by the Proposed Gas Pipeline

Subbasins and Watersheds Crossed by Proposed Pacific Connector Pipeline

	Level 5 Watershed		
Subbasin	**Watershed Name**	**HUC a/**	**Miles Crossed b/**
Coos	Coos Bay- Frontal Pacific Ocean	1710030403	15.4
	South Fork Coos River c/	1710030401	2.0
Coquille	North Fork Coquille River	1710030504	11.5
	East Fork Coquille River	1710030503	9.7
	Middle Fork Coquille River	1710030501	15.8
South Umpqua	Olalla Creek-Lookingglass Creek	1710030212	8.8
	Clark Branch - South Umpqua River	1710030211	12.8
	Myrtle Creek	1710030210	8.9
	Days Creek - South Umpqua River	1710030205	19.2
	Elk Creek c/	1710030204	3.3
	Upper Cow Creek	1710030206	5.3
Upper Rogue	Trail Creek	1710030706	10.7
	Shady Cove - Rogue River	1710030707	8.1
	Big Butte Creek	1710030704	5.1
	Little Butte Creek	1710030708	32.9
Upper Klamath	Spencer Creek	1801020601	15.1
	John C. Boyle Reservoir - Klamath River-	1801020602	5.4
Lost River	Lake Ewauna-Upper Klamath River	1801020412	16.3
	Mills Creek - Lost River	1801020409	23.0
		Total	**229.1**

a/ Hydrologic Unit Code (USGS 1987).
b/ Total miles of watershed area crossed by the pipeline in each HUC, rounded to nearest tenth of a mile.
c/ There are no waterbodies crossed in these watersheds.

2.6 Documents Filed in Support of the JCEP Application

Jordan Cove submitted the following documents in support of their request for water quality certification:

May 22, 2018 – U.S. Army Corp Engineers Section 404/10 permit application (NWP-2017-014)

- US Army Corp Engineers Section 404/10 permit application materials (Oct. 23, 2017)
  - Additional Application Information to NWP-2017-041 (November 21, 2018)

- Section 401 Water Quality Package (February 6, 2018)
  Part 1: Jordan Cove Energy Project 401 Package
  Part 2: Pacific Connector Gas Pipeline 401 Package

- Additional Application Information to NWP-2017-041 (March 19, 2019).
- Responses to requests for additional information filed by DEQ on September 7, December 20, 2018, March 11 and March 13, 2019.

2.7 Public Notice(s) Issued by the Federal Licensing Authority

On May 22, 2018, the US Army Corps of Engineers publically noticed the receipt of a Section 404/10 application by the Jordan Cove LNG, LLC.[4] Corps' public notice also included a public notice of receipt of an application to DEQ for section 401 water quality certification pursuant to OAR 340-048-0032(1). The issuance date and public comment period for the applications were as follows:

Issue Date: May 22, 2018
Expiration Date: July 21, 2018
US Army Corps of Engineers No: NWP-2017-41

Following requests from the public, the Corps and DEQ extended the public comment period to August 20, 2019.

2.8 Land Use Determination by Local Planning Jurisdiction

An application for a 401 water quality certification is required to include land use compatibility findings for the activity prepared by the local planning jurisdiction (OAR 340-048-0020 (2)(i)(A)). The Project is located in the land use planning jurisdictions of Klamath County, Jackson County, Douglas County - noncoastal and coastal - sections, Coos County, City of Coos Bay, and the City of North Bend.

The JCEP supplied land use compatibility statements from Klamath County, Jackson County, Douglas County - coastal and non-coastal sections, Coos County, City of Coos Bay, and City of North Bend for the associated Pacific Connector pipeline and Jordan Cove Liquid Natural Gas Projects on January 28, 2019. DEQ found that the land use compatibility statements to be insufficient for various reasons (i.e., no determination of compatibility was made by the jurisdiction; land use approval had expired; and, in another case, an appeal was pending).

DEQ received additional information related to land use on April 30, 2019. This submission did not provide time for DEQ to evaluate it before making its 401 water quality certification decision.

Land use compatibility is addressed in more detail in Section 8 of this report.

2.9 Consistency with Other Requirements of State Law

Please refer to section 8 of this Evaluation and Findings Report.

[4] https://www.nwp.usace.army.mil/Missions/Regulatory/Notices/Article/1529167/nwp-2017-41/

3.0 Project Description

The Project consists of two distinct but interconnected parts: the Jordan Cove LNG Export Terminal, and the Pacific Connector Natural Gas Pipeline. Jordan Cove developed the Section 404/10 permit application in two sections to present each principle project component: Part 1 presents the Jordan Cove LNG Export Terminal; Part 2 presents the Pacific Connector Gas Pipeline. The following sections present descriptions of the proposed activities.

3.1 Jordan Cove LNG Export Terminal

The proposed Jordan Cove LNG export terminal would be located on the bay side of the North Spit of Coos Bay, Oregon. The export terminal and associated facilities (collectively, the "LNG Export Facilities") include the following components:

- LNG Export Terminal
- Slip and Access Channel
- Materials Offloading Facility
- Navigation Reliability Improvements
- Meteorological Station
- Industrial Wastewater Pipeline
- Trans Pacific Parkway / US 101 Widening
- APCO Sites 1 and 2
- Kentuck Site
- Eelgrass Mitigation Site
- Temporary Construction Areas

A complete description of the proposed action is presented in Section 6 of Part 1 of the Section 404/10 Permit Application filed by Jordan Cove with the Corps, and further described in Resource Report RR1 ("General Project Description") dated September 2017[5]. This report incorporates by reference the entirety of the proposed project as described in these documents and as summarized below:

LNG Terminal

The LNG Terminal includes all building infrastructure, machinery, utilities, and other project components associated with the receipt, liquefaction, storage, and loading of LNG onto ocean-going LNG carriers for export. The principle areas include the following:

- Ingram Yard – Includes LNG storage, loading, and export facilities.
- South Dunes Site – Includes temporary and permanent facilities including a Workforce Housing Facility, metering station, administrative building, and the Southwest Oregon Regional Safety Center.
- Access and Utility Corridor – A narrow corridor connects Ingram Yard with the Dunes site, which would provide temporary construction and permanent access roads and facilities, and would include the Fire Department Facility, underground utilities, and gas feed to the LNG Terminal.

Slip and Access Channel

Jordan Cove proposes a 38-acre marine slip for vessel loading. Jordan Cove proposes to excavate the marine slip from land that is currently upland area in the North Spit. To connect the Slip with the existing Coos Bay Federal Navigation Channel, Jordan Cove proposes to dredge about 22 acres of open water area. The Access Channel would be excavated to a depth of 45.21-feet MLLW with a 2-foot overdredge allowance and a 1.7-foot advance maintenance allowance (total depth of 48.91 feet MLLW, or 11.91-feet deeper than the authorized Federal

[5] Resource Report No. 1 General Project Description, Jordan Cove Energy Project September 2017. https://www.jordancovelng.com/pdf/FERC-Filing-Public-Only/JCEP/Volume-II-Public/RR1/2.1.1-JCEP-RR1.pdf

Navigational Channel depth at Channel Mile 7.3 near the proposed Project.[6]

Materials Off-Loading Facility
This area includes a permanent marine offloading facility for initial delivery of construction equipment, site construction, and future delivery of construction equipment related to facility maintenance.

Navigation Reliability Improvements
JCEP plans to excavate four submerged areas lying adjacent to the FNC to improve navigation efficiency and reliability for under broader weather conditions. The four NRI locations would require dredging approximately 700,000 cubic yards of sediment and the creation of disposal areas in the Coos Bay area.

Meteorological Station
Jordan Cove proposes to construct a new, permanent meteorological facility located on the west side of the lagoon on the North Spit. The facility would measure wind speed, direction, and other data to provide weather information to the LNG Terminal facility to support ship navigation.

Industrial Wastewater Pipeline
Relocation of an existing industrial wastewater discharge line near the Trans Pacific Parkway.

Trans Pacific Parkway and U.S. Highway 101Intersection Widening
Jordan Cove proposes to widen the intersection of the Trans Pacific Parkway and US-101 to provide safe ingress/egress during construction. The proposed widening would create a left-turn lane from Trans Pacific Parkway onto northbound US-101, and a right-turn lane from US-101 onto Trans Pacific Parkway.

APCO Sites 1 and 2
Jordan Cove proposes to utilize two land parcels on North Point, separated by a mudflat, for permanent placement of dredge material and temporary laydown of construction material.

Kentuck Project Mitigation Site
Jordan Cove proposes to mitigate for impacts to wetlands by restoring hydrologic and habitat function at the approximately 100-acre former golf course located adjacent to Kentuck Slough.

Eelgrass Mitigation Site
To mitigate for the permanent loss of eelgrass habitat due to dredging the Access Channel, Jordan Cove proposes to create a 9.3-acre eelgrass mitigation site near the offshore end of the North Bend Municipal Airport runway.

Temporary Construction Sites
Jordan Cove proposes to use additional sites outside of the immediate project construction footprint to provide space for construction staging, temporary equipment laydown, and employee park & rides. These areas include the Port Laydown site, Roseburg, Boxcar Hill, Myrtlewood and Ride and Mill Casino Park and Rides and APCO Site.

3.2 Pacific Connector Natural Gas Pipeline

Pacific Connector proposes to site, construct, and operate a 229-mile 36-inch diameter natural gas pipeline from interconnections with two existing interstate natural gas pipelines, the Ruby Pipeline and Gas Transmission Northwest LLC's GTN Pipeline, near Malin, Oregon, to the proposed Jordan Cove LNG Export Terminal near Coos Bay, Oregon. Part 2 of the Section 404/10 application filed with the Corps describes the proposed pipeline. The proposed action is further described in Resource Report RR1 ("General Project Description") provided as

[6] This depth would be consistent with the depth of the FNC that is proposed under the Port of Coos Bay Channel Modification, which is currently under consideration by the Corps. See, https://www.nwp.usace.army.mil/coast/coos-bay/channel-modification/ (last visited 5/3/2019).

Attachment A to the Corps' application. This report fully incorporates by reference the description of the proposed pipeline and associated facilities (collectively, the Applicant) presented in these two Corps' documents, which are briefly summarized below:

3.2.1 Pacific Connector Natural Gas Pipeline

Applicant is seeking to construct and operate a new 229-mile 36-inch diameter gas pipeline. The proposed pipeline would receive natural gas from interconnections near Malin, Oregon and deliver the gas to the Jordan Cove LNG Export Terminal near Coos Bay, Oregon. There, the natural gas would be liquefied, stored, and load onto vessels for transit to Pacific markets. The pipeline is expected to transport up to 1,200,000 decatherms per day (Dth/d) at 1600 psig and produce up to 7.8 million metric tons per annum (mtpa) LNG for export.

Over most of the alignment, the pipeline would occupy a 95-foot temporary easement during construction and a 50-foot permanent easement during operation. Applicant proposed exceptions to the width of both the operational and permanent easement to reduce impacts to areas such as wetlands and stream crossings. Applicant describes the proposed alignment of the Applicant gas pipeline in the Environmental Alignment Sheets, Appendix H.1 of Resource Report 1, which is incorporated herein by this reference.

3.2.2 Aboveground Facilities

Applicant proposes permanent infrastructure installations to support operation of the gas pipeline. Aboveground facilities proposed by Applicant are described in Section 1.1.2.3 of Resource Report 1, General Project Description, and summarized below.

Klamath Compressor Station

Applicant would locate the Klamath Compressor Station at MP 228.81 near the interconnection with the existing Ruby and Gas Transmission Northwest (GTN) pipelines. The compressor station includes two turbine-driven centrifugal compressor units providing 62,200 ISO[7] horsepower of compression and one similar 31,300 ISO horsepower compressor unit for backup compression operation.

Jordan Cove Meter Station

The Jordan Cove Meter Station would be located at the pipeline terminus on 1.72 acres of the Jordan Cove site adjacent to the LNG export terminal. A pig launcher/receiver and mainline block valve would be located within the meter station facility.

Launchers and Receivers

Pigging is the practice of using devices ("pigs") to conduct routing maintenance and inspection of pipeline interiors. Applicant would insert pigs at launching stations and transport these under pressure to a receiving station. Applicant proposes pig launching and receiving stations at each end of the pipeline. Applicant also proposes intermediate stations collocated with Block Valve Assemblies #6, #11 and #14 at MPs 71.51, 132.46 and 187.43.

Mainline Block-Valve Assemblies

Applicant proposes seven mainline block valves to isolate sections of the pipeline consistent with US Department of Transportation requirements and applicable guidance or rules by the Pipeline and Hazardous Materials Safety Administration. Applicant would automate five block-valves at intermediate locations along the alignment.

Communications Sites

Communications between the Klamath Compressor Station and the Jordan Cove Meter Station would require communication sites distributed along the pipeline alignment. Applicant expects fifteen communications locations are required including those located at the Klamath Compressor Station and the Jordan Cove Meter Station. Applicant is investigating leasing capacity from existing communications sites and building new facilities, as needed. Where feasible, new installations would be collocated with proposed aboveground facilities.

[7] International Organization for Standardization.

3.2.3 Land Requirements

Applicant describes the land required to construct and operate the proposed gas pipeline in Section 1.2 of Resource Report 1, General Project Description. DEQ incorporates this description by reference in this report. A summary of temporary and permanent land required for the project is presented in Table 2, below.

Table 2: Total Pipeline Land Requirements for Construction and Operation

Pipeline Component	Length (miles) or Number of Sites	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Facilities	229.09*	2,582.04	1,373.66[1] / 820.60
Temporary Extra Work Areas[2]	1,603	922.64	(44.80)[7]
Uncleared Storage Areas	320	676.44	0.00
Quarries & Disposal Sites	20	41.18	(41.18) [7]
Contractor and Pipe Storage Yards	36	674.17	0.00
Existing Roads Needing Improvements in Limited Locations [3]	32 Improvements (27 Roads)	22.52	(22.70)[9]
Temporary Access Roads	10	3.80	0.00
Permanent Access Roads	15	2.16[4]	2.16[4]
Aboveground Facilities	17	22.75[5]	22.75[6]
Total		**4,947.70**	**1,398.57[7, 8]**

* Because of changes in the centerline and associated MP equations, the ending MP no longer represents the actual centerline length.
[1] New permanent easement is 50-feet on private and federal lands.
[2] TEWAs are shown on the Environmental Alignment Sheets provided in Appendix H.1.
[3] Includes those existing roads requiring widening in specific locations; does not include limbing/brush clearing or blading/grading for potholes.
[4] Portions of the PARs are within the construction right-of-way and permanent easement.
[5] Construction impacts associated with the aboveground facilities are included in the construction impacts for the Pipeline facilities except the 8 potential communication tower sites and the Klamath Compressor Station, which are included here (1.61 acres and 17.14 acres, respectively).
[6] Portions of the operational impacts of the aboveground facilities are included within the permanent easement acreage.
[7] Represents TEWAs, existing quarries, and rock source and disposal sites provided in Table A.8-4 that may be used as permanent storage areas. The acreages are not included in the overall operational total because the storage areas will not be used during operation of the Pipeline.
[8] Although the improvements will not be reclaimed, these road improvements are not needed for operations, and the acres are not included in the total operational acreage.

Source: Pacific Connector Gas Pipeline Project, Resource Report 1

3.3 Port of Coos Bay Proposed Channel Deeping Project

The Oregon International Port of Coos Bay is proposing modifications to the lower Coos Bay Federal Navigation Channel to deepen, widen and lengthen the channel (the "Port Channel Deepening Project").[8] The Port Channel Deepening Project would expand the existing channel from -37' depth and 300' width to -45' depth and 450' width from the channel entrance to river mile 8.2, just beyond the Jordan Cove LNG Export Terminal. The Port Channel Deepening Project is not included in the activity under consideration for this 401 WQC sought by Jordan Cove. Jordan Cove did not request that DEQ consider the effects of the proposed deepening of the Federal Navigation Channel in the section 401 evaluation for the JCEP. According to Jordan Cove and the U.S. Coast Guard, the JCEP could function without the Port Channel Deepening Project, although the timing and (potentially) the overall volume of vessel traffic would likely be different.

[8] https://www.portofcoosbay.com/channel-deepening

Jordan Cove requires a depth of -45 feet to accommodate the expected class of LNG carriers with a minimum 10-percent under-keel clearance while ships are in dock. Because the draft of these vessels exceeds the present depth of the Federal Navigation Channel, these vessels cannot fully utilize the channel on all tides. Further, the Port Channel Deepening Project is largely dependent on JCEP as a source of financing for the proposed work. The Federal Energy Regulatory Commission is considering the cumulative effects of the Channel Deepening Project together with the effects of the proposed LNG Export Facilities.[9] In the event that Jordan Cove resubmits an application for certification, DEQ requests that the analysis being performed for FERC (or the Corps, or other similar information) be included in the submittal to DEQ given the likelihood that if the JCEP becomes operational, the Channel Deepening Project is also likely to occur. Information that DEQ currently holds shows that there could be cumulative effects on salinity and dissolved oxygen. The significance of these effects has not been fully analyzed at this time.

4.0 Water Quality Standards

Water quality standards are comprised of three elements. These include the beneficial uses that must be protected, the water quality criteria intended to protect those uses, and an antidegradation policy that is designed to prevent worsening existing water quality. To support all beneficial uses, DEQ applies numeric and narrative criteria to specific waterbodies and reaches within those waterbodies. OAR 340, Division 41 contains Oregon's water quality standards including beneficial uses, policies, and criteria. This section of the Evaluation and Findings Report identifies the beneficial uses designated within the area of the proposed Project and the narrative and numeric criteria established to protect those uses.

[9] FERC DEIS, at 4-793.

4.1 Beneficial Uses

Table 3 identifies designated beneficial uses within the area of the proposed Project.

Table 3: Designated Beneficial Uses

	South Coast		Umpqua		Rogue			Klamath	
Beneficial Use	**Estuaries and Adjacent Marine Waters**	**All Streams and Tributaries Thereto**	**South Umpqua River Main Stem**	**All Other Tributaries to Umpqua, North and South Umpqua Rivers**	**Rogue River Main Stem From Estuary to Lost Creek Dam**	**Rogue River Main Stem above Lost Dam and Tributaries**	**All Other Tributaries to Rogue River and Bear Creek**	**Klamath River from Klamath Lake to Keno Dam**	**Lost River and Lost River Diversion Channel**
Public Domestic Water Supply		X	X	X	X	X	X	X	X
Private Domestic Water Supply		X	X	X	X	X	X	X	X
Industrial Water Supply	X	X	X	X	X	X	X	X	X
Irrigation		X	X	X	X	X	X	X	X
Livestock Watering		X	X	X	X	X	X	X	X
Wildlife and Hunting	X	X	X	X	X	X	X	X	X
Fishing	X	X	X	X	X	X	X	X	X
Boating	X	X	X	X	X	X	X	X	X
Water Contact Recreation	X	X	X	X	X	X	X	X	X
Aesthetic Quality	X	X	X	X	X	X	X	X	X
Hydro Power		X	X	X		X	X	X	
Commercial Navigation and Transportation	X				X			X	
Fish and Aquatic Life	X	X	X	X	X	X	X	X	X

4.2 Numeric and Narrative Criteria

Oregon has adopted numeric and narrative criteria to support designated beneficial uses. DEQ's biologically based numeric criteria identify minimum conditions necessary to support life-stage histories of sensitive aquatic receptors such as salmonids. DEQ further implement numeric criteria through basin-specific rules that reflect regional water quality requirements. DEQ uses Oregon's narrative criteria to identify goals, practices and objectives to prevent degradation of water quality characteristics necessary to support all beneficial uses.

Section 305(b) of the Clean Water Act requires that states bi-annually assess the status of water quality. Water bodies that do not provide full support for designated beneficial uses are included on a list of impaired water bodies as required by Section 303(d) of the Clean Water Act. Impaired water bodies cannot assimilate additional pollution. DEQ is required to develop Total Maximum Daily Loads for impaired segments of water bodies to reduce pollution loading with the objective of attaining compliance with numeric and narrative criteria. In water bodies that are on the 303(d) list, where no TMDL has yet been adopted, new discharges may be allowed only if it is demonstrated that they would not increase the applicable pollutant load or that any such increase is mitigated.

4.3 Antidegradation Policy

Oregon's antidegradation policy (OAR 340-041-0004) applies to all surface waters. Oregon's antidegradation policy complements the use of water quality criteria. While numeric criteria provide the minimum conditions

needed to protect designated uses, antidegradation extends protection to waters whose characteristics meet or exceed minimum criteria. The policy prohibits degradation of water quality in some circumstances and provides for exceptions in others; however, the policy allows the lowering of water quality only after a systematic decision-making process considering many factors. These factors include the waterbody classification, consideration of alternative treatments, and a comparison of economic and social benefits with environmental costs. In addition, the antidegradation policy requires the involvement of the public through direct notice and through coordination with other government agencies. In this way, DEQ makes decisions to maintain or to change current water quality only after a deliberate and inclusive process. The goal of the antidegradation policy is to prevent unnecessary further degradation of water quality and to protect, maintain, and enhance the quality of existing surfaces waters to ensure the full protection of all existing beneficial uses

5.0 Proposed Actions Included in this 401 Analysis

Sections 3.1 and 3.2 of this Evaluations and Findings Report summarize the activities that are considered in this 401 WQC. These sections describe, in more detail, the methods and activities proposed by Jordan Cove and Pacific Connector to construct and operate the Jordan Cove Energy Project.

5.1 Pipeline Construction

Pipeline construction procedures are described in Section 1.3 of Pacific Connector's Resource Report 1 and are summarized below.

The 229-mile proposed pipeline alignment extends from the Jordan Cove LNG Export Terminal in Coos Bay to interconnections with existing pipelines near Malin, Oregon. Typical construction steps include surveying and staking the alignment, clearing and grading, trenching for pipe installation, pipe assembly, pipe placement and backfilling, hydrostatic testing, and site restoration. Because of the geographic scope of the project, Applicant anticipates performing pipeline construction in at least five construction spreads.

Applicant proposes to construct the pipeline generally within a 95-foot wide temporary construction right-of-way. To reduce impacts to water bodies or other sensitive areas the construction corridor, Applicant proposes to reduce the construction right-of-way width to 75 feet when it is sited through wetlands and waterbodies. Applicant anticipates pipeline construction would require an additional 922 acres of temporary extra work areas adjacent to the construction right-of-way to accommodate temporary storage of timber, slash, soil, rock, material and other construction-related equipment.

Applicant expects to exceed the minimum pipeline burial depths required by US Department of Transportation in 49 CFR 192.327. Where possible, JCEP would install the pipeline up to 36-inches deep in Class 1 areas with normal soils and 24-inches deep in Class 1 areas with consolidated rock. Applicant may consider deeper burial depths at stream crossings based on site conditions and concerns about erosion or scour potential.

Applicant proposes a significant portion of the alignment in rugged mountainous areas of Oregon's Coast Range and Cascade Range. A portion of the alignment traverses the Tyee Core Area with in the Coast Range. This area is characterized by steep slopes, erosive soils, rapidly moving landslides, and deep-seated landslide activity. During routing of the Pipeline, Applicant generally aligned the pipeline along ridgelines, where feasible, to minimize cut and fill requirements, traversing steep slopes, and conflicts with other potential geologic hazards. However, in numerous areas the pipeline must descend and ascend steep slopes to cross stream valleys.

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5.2 Waterbody Crossings

The proposed 229-mile pipeline would affect approximately 352 waterbodies (not including wetlands). Of these, 69 have been identified as perennial streams and 270 as intermittent streams. The pipeline route would also affect some ponds and ditches, and the Coos Bay estuary. For intermittent streams that are not flowing at the time of construction, Applicant proposes standard overland construction techniques consistent with FERC national guidelines. Applicant expects to bury the top of the pipe to at least five feet below the streambed at all crossings.

For most streams that are flowing at the time of construction, Applicant proposes to use one of three dry open cut crossing methods. These methods temporarily divert the flowing stream around the crossing location to allow construction to proceed in a dewatered work area. Dry open-cut techniques include:

Diverted Open-Cut

Applicant proposes a diverted open-cut for the eastern (second) crossing of the South Umpqua River at about MP 94.7. This is the only crossing where a diverted open-cut is proposed. Applicant would achieve this crossing by diverting the river's flow into half of the channel while work is performed on the opposite half. Upon completion, flow would be routed to the opposite side of the channel to complete the installation. Applicant prepared a site-specific plan for crossing the South Umpqua River at MP 94.7.39. The river is approximately 125 wide at this location.

Fluming and Dam-and-Pump Techniques

Both fluming and dam-and-pump techniques rely on diverting upstream flow around the work area. Fluming systems use gravity flow through a series of pipes, while dam-and-pump techniques use mechanical pumps to transfer flow around the isolated work area. Both are generally used on crossings under 100 feet in width. These techniques require the temporary installation of an upstream and downstream dam to isolate the work area and create a pool of water to be diverted, as well as a dewatering system to remove water from the active work area. Details of the waterbody crossing techniques proposed by Applicant are described further in Section 2.2.5 of Resource Report 2.

Direct Pipe

Direct Pipe is a trenchless technology that provides a continuously supported hole during installation. Direct Pipe installations use an articulated, steerable micro-tunnel boring machine mounted to the leading end of the pipe or casing. Applicant would use bentonite slurry to increase lubrication and advance the micro-tunnel boring machine. Direct Pipe uses lower internal pressures and eliminates the reaming and pullback requirements of a horizontal directional drill. Applicant provides an overview of Direct Pipe technology in Appendix J.2 of Resource Report 2 including a report on the proposed direct pipe crossings beneath Interstate I-5, Dole Road, a railroad, and the South Umpqua River at MP 71.30.

Horizontal Directional Drill

Applicant proposes to install the pipeline using trenchless, horizontal directional drilling techniques beneath two sections of the Coos Bay Estuary (MP 0.3–1.0 and MP 1.5–3.0), three major waterbodies (Coos River at MP 11.1R; Rogue River at MP 122.7; and Klamath River at MP 199.4). HDD installations require establishing a pilot hole along the drill path and enlarging the hole with successive passes of a reaming tool until Applicant can install the pipe . During drilling and reaming operations, Applicant would advance high pressure drilling fluid consisting of bentonite slurry through the drill pipe. Return fluid flows back through the annular space to the maintain borehole and provide lubrication. Maintaining proper pressure within the borehole is critical. Low pressure can cause the installation to seize. However, internal drilling pressures exceeding the resistive overburden forces can cause escape of drilling fluids to the overlying waterway.

5.3 Construction and Maintenance of Roads

Access to the pipeline right-of-way during construction and operation would require the use of existing access roads, the construction of new temporary and permanent access roads, and transportation of equipment within the construction and permanent right-of-ways. Roads under heavy loads represent a significant potential source of sediment input to hydrologically connected streams.

Applicant has identified over 660 miles of existing access roads that it would use to access the pipeline during construction.[10] These include roads on federal, municipal and private lands. Applicant identifies numerous miles of these existing access roads as gravel, dirt, rock, and pit run surfaced roads. Applicant has not provided a field inventory of these roads to ensure a realistic understanding of upgrades and/or best management practices that would be needed to prevent sediment runoff to receiving streams.

Applicant is also proposing the new construction of approximately 25 segments of Temporary Access Roads and Permanent Access Roads to connect the construction right-of-way with existing access roads identified above. Lastly, Applicant would use a 229-mile construction access road in the construction right-of-way to allow construction equipment and vehicles to perform trenching and pipeline construction activities. Temporary Access Roads and Permanent Access Roads must be designed, built and maintained according to minimum design standards to prevent sediment discharge during pipeline construction.

5.4 Permanent Pipeline Right-of-Way

JCEP would maintain a permanent easement for the long-term operation and maintenance of the pipeline. The permanent easement would occupy approximately 1,374 acres based on the proposed 50-foot width. Applicant would control the vegetation in 30-feet of this 50-foot permanent easement as described below. To allow access along the right-of-way for inspections and maintenance, Applicant would maintain the permanent easement in an herbaceous state within a 10-foot corridor centered on the pipeline. In addition, Applicant would maintain vegetation in a small shrub and herbaceous state within 5 feet beyond the 10-foot corridor described above. Applicant would not alter the revegetated area beyond 15 feet of the pipeline centerline.

Development and maintenance of the permanent easement would alter surface hydrology within the permanent right-of-way. To manage post-construction stormwater and groundwater flow beneath the pipeline, Applicant proposes to install permanent erosion control devices including of trench breakers, slope breakers or waterbars, and perform revegetation measures to permanently stabilize disturbed areas. DEQ recognizes stormwater runoff from permanently maintained portions of the Project right-of-way as potential sources of pollution to hydrologically connected streams and waterways. This Evaluations and Findings Report evaluates the effectiveness of BMPs and controls proposed by the JCEP to reduce the impact on water quality of stormwater from the permanent right-of-way.

5.5 Terminal and Off-Site Project Area Stormwater

DEQ requires a post-construction stormwater management plan from applicants for section 401 water quality certifications if the project will add or reconstruct impervious surface areas.[11] On September 7, 2018, DEQ requested JCEP prepare and submit a post-construction stormwater management plan developed according to DEQ's March 2018 guidelines. The plan must address proper management of process chemicals, spill containment controls, best management practices, and a maintenance schedule for engineering controls.

Applicant must also address the discharge of stormwater from off-site areas. DEQ also recognizes that stormwater discharges from these areas may contact off-site placement of dredged material causing sediment discharge, turbid

[10] Table A.8-1 (Access Road Table), Part 2, Appendix B, Section 404 Permit Application

[11] Post-Construction Stormwater Management Plan Submission Guidelines. DEQ, March 2018.

flows, and decant water (i.e., leachate) to public waters. For freshwater wetlands, the discharge of saline decant water can alter aquatic species composition. This Evaluations and Findings Report evaluates the effectiveness of BMPs proposed by the JCEP to reduce the impact on water quality of stormwater from Terminal and Off-Site Project Area stormwater.

5.6 Jordan Cove LNG Terminal Dredging

JCEP proposes to dredge portions of the North Spit of Coos Bay to construct its LNG Export Terminal. The principle areas include the marine slip, and access channel connecting the slip to the existing Federal Navigation Channel, and four areas abutting the current boundary of the navigation channel between RM 2 to RM 7 (figure 2.1-1). Dredging would modify the physical morphology of the channel, by widening four turns along the channel, to allow for more efficient transit of LNG carriers. The proposed dredging would be sloped to an angle of three feet horizontal to one foot vertical (3:1). The access channel and slip would have a depth of 45 feet (deeper than the current navigation channel, which is currently maintained at 37 feet). The proposed dredging would generate approximately 6.32 million cubic years of material. Dredged material would be used to elevate the proposed LNG Terminal facilities, and disposed of at a combination of other sites including Roseburg Forest Products, the Al Pierce Company (APCO), and at Kentuck slough (a 140-acre wetlands mitigation site). The Project would require ongoing maintenance dredging as well as the initial dredge operations.

6.0 Water Quality Compliance Evaluation

6.1 Statewide Narrative Criteria

6.1.1 Applicable Standard

Oregon Administrative Rule 340-041-0007 contains Oregon's statewide narrative criteria, which supplement Oregon's numeric water quality standards and Oregon's antidegradation policies. In pertinent part, this rule provides that:

(1) Notwithstanding the water quality standards contained in this Division, the highest and best practicable treatment and/or control of wastes, activities, and flows must in every case be provided so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor, and other deleterious factors at the lowest possible levels. * * *

(7) Road building and maintenance activities must be conducted in a manner so as to keep waste materials out of public waters and minimize erosion of cut banks, fills, and road surfaces. * * *

(11) The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.

6.1.2 DEQ Evaluation

6.1.2.1 Pipeline construction

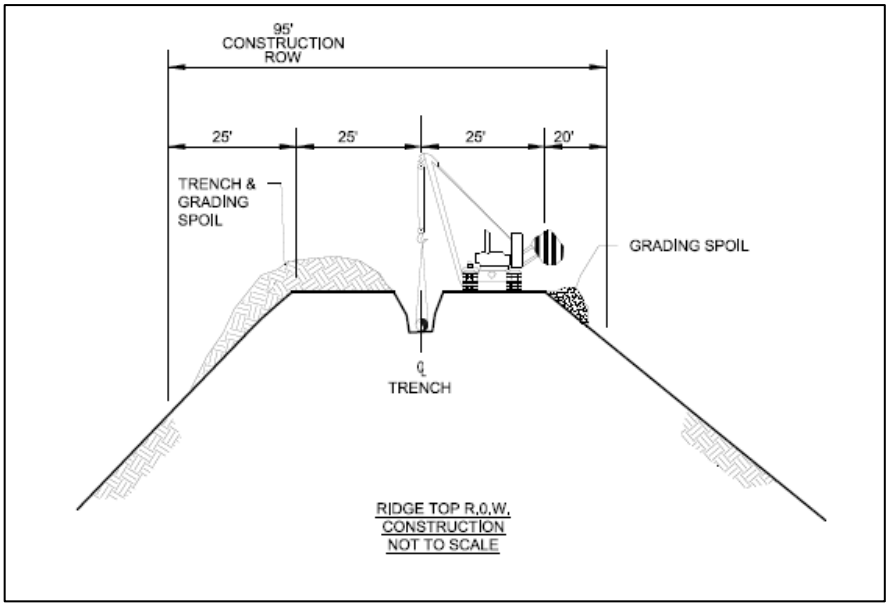
JCEP's proposed development of the construction right-of-way does not exhibit the highest and best controls and does not demonstrate that these improvements would minimize the erosion of and discharge of inorganic and organic debris, turbid flows, and sediment from cut banks, fills, and road surfaces. As noted above, pipeline construction necessitates the development of a construction right-of-way (ROW) including a construction access road for trenching and pipe laying equipment and Temporary Extra Work Areas (TEWAs) for construction staging and for storing equipment, material, and construction overburden. In developing the construction ROW, JCEP proposes to clear all trees and shrubs in this ROW. The width of this vegetation clearing would be 95 feet and

narrow down to 75 feet through wetlands and waterbody crossings. The development of TEWAs would increase the 95 foot width in upland areas and near streams and wetlands. In upland areas, JCEP would limit stump removal to the trench line and areas where grading is necessary to construct a safe, level working plane.[12] In the TEWAs, JCEP would store equipment and materials as well construction overburden (i.e., rock, soil, slash) for disposal or reuse.

The grading to level the surface in the ROW and TEWAs would include grading on steep slopes and ridgetops as depicted in Figure 3 below (Drawing Number 3430.34-X-0018).[13] This schematic is not drawn to scale as noted and does not reflect site-specific loads (trench/grading spoil and fill from leveling) placed on steep and potentially unstable slopes from the removal of rock and soil from ridgetops.

Although not delineated on JCEP's Environmental Alignment Sheets (Resource Report 1, Appendix H.1) or discussed in their Erosion Control and Revegetation Plan, typical drawings for right-of-way cross-sections in Resource Report 1 clearly show the use of a construction access road in the right-of-way. Without a durable surface, the soil in this corridor would experience compaction during the construction of the right-of-way, and during the trenching for pipe installation. The resulting soil compaction would increase runoff and, subsequently, erosion of native soils via rill and gully erosion without additional BMPs for the construction access road surface.

Figure 3: Schematic of Ridgetop Right-of-Way



JCEP has not provided BMPs for the 229-mile construction access roadway in the form design standards, specifications, and measures necessary to support the anticipated traffic load.[14] For example, design standards would inform the construction of the road surface based on estimated traffic load. Design manuals are available that provide BMPs for a stabilized construction roadway where displacement of soil occurs due to vehicle traffic.[15,

[12] Pacific Connector Gas Pipeline. 2018. *Right-of-Way Clearing Plan for Federal Land*. Appendix E, Plan of Development Report U. Section 401 Water Quality Package

[13] Pacific Connector. 2017. *Erosion Control and Revegetation Plan*.

[14] Federal Highway Administration. 2000. *Gravel Roads – Maintenance and Design Manual*. U.S. Department of Transportation Local Transportation Assistance Program.

[15] State of California Department of Transportation. 2003, *Construction Site Best Management Practice Field Manual and Troubleshooting Guide*. CTSW-RT-02-007

[16] During a rain event, a durable unpaved road surface is essential to prevent fine soil particles from migrating to the road surface under truck traffic. Once on the road surface, stormwater entrains this soil during wet weather transporting it to swales (e.g., zero order streams), first order streams (e.g., bedrock hollows), and to streams. With the proposed pipeline alignment traversing 117 miles of steep slopes and 94 miles of severe erosion potential soils, careful selection of BMPs and the application of treatment methods are essential for water quality protection.

Construction access road design standards and specifications as well as design drawings should also guide construction of the 229-mile access road drainage system and the treatment controls for its discharge. These standards and specifications and their inclusion in design plans would influence the selection of discharge points that direct stormwater discharge to structural stormwater treatment controls or vegetated areas with permeable soils.

To avoid initiating a landslide on the extensive area of unstable slopes along the pipeline ROW, JCEP must identify the location of discharge points for concentrated stormwater flow from swales and channels collecting this runoff. In the sections below, DEQ documents the potential water quality impacts to streams that would likely result from discharges of stormwater to landslide prone slopes, as well as from the placement of fill or spoils on such slopes. JCEP has not provided specific designs for the construction access road stormwater management system adjacent to steep slopes (>30%) and landslide susceptibility zones. Rather, in Section 4.1 of the proposed ECRP, JCEP proposes a list of temporary erosion control BMPs for the construction ROW that DEQ evaluates below.

Construction Right-of-Way BMPs

JCEP would use temporary slope breakers (i.e., water bars) to prevent rill and gulley erosion when construction stormwater discharges from the ROW, the 229-mile construction access road, and the non-working side of the ROW. If properly spaced, slope breakers may effectively serve as a runoff control, preventing rill and gully erosion in the construction ROW and construction access road. However, JCEP has not provided information on how JCEP would ensure their proper function under anticipated traffic loads. Without additional design considerations, this traffic would compact the berm of the slope breaker and modify the excavated channel form, potentially modifying its flow path (see Resource Report 1, Drawing Number 3430.34-X-0008). Stormwater moving out of slope breaker and back onto the ROW would form rill and gully erosion and potentially affect the proper function of downstream temporary slope breakers.

Stormwater with suspended sediment from the construction ROW and construction access road would collect in the excavated channel in front of each slope breaker and would flow towards a discharge point. JCEP has not provided DEQ with specific information demonstrating that there are BMPs, for example, to prevent (1) rill and gully erosion from concentrated flow at discharge points and (2) sediment discharge from exposed soil to zero order streams. Zero order streams refer to swales such as bedrock hollows and are an integral part of stream networks serving as conduits to first order streams.[17] JCEP has not provided DEQ with information on the distance between the discharge point of slope breakers and other erosion control BMPs and zero order streams. Moreover, JCEP has not demonstrated that it would avoid stormwater discharge to areas of landslide susceptibility connected to zero order streams as discussed below in more detail. JCEP's proposed construction ROW would place grading spoils and, if needed, fill to level working surface. Construction of the pipeline appears likely to discharge stormwater to these landslide susceptibility zones commonly referred to convergent headwalls, as exhibited in Figure 4 below. As discussed in more detail and supported below, research and technical manuals indicate that adding water and weight to unstable slopes should be avoided during design of linear infrastructure projects.

In Section 4.1.4 of the ECRP, JCEP proposes to use mulch (i.e., effective ground cover). The application of mulch to exposed soil is an effective BMP presuming stormwater run-on controls are in place to prevent stormwater from

[16] Nevada Department of Transportation. 2004. *TC-2: Stabilized Construction Roadway*. Storm Water Quality Handbooks

[17] Gomi, Takashi, Roy C. Sidle, and John S. Richardson. 2002. *Understanding Processes and Downstream Linkages of Headwater Systems*. Bioscience, Volume 52(10): 905-916

mobilizing the mulch in runoff as discussed by Burroughs (1990). JCEP states that it would use this BMP when permanent stormwater controls such as reseeding and permanent slope breakers installed on the operational ROW are delayed beyond 20 days. During wet weather, exposed soil is subject to splash erosion initiating runoff and the potential for rill and gully erosion carrying sediment to streams. The criteria of a 20-day delay in installing permanent controls places water quality at risk. During wet weather, absent applying mulch to exposed soils within the construction ROW and control run-on to these mulched areas where construction activity is not occurring or planned in the immediate future, excessive sediment is likely to reach streams. Moreover, on its Environmental Alignment Sheets, JCEP has not delineated the travel ways into and within TEWAs or selected a durable surface for these travel way as a source control for these exposed soil surfaces. As discussed in construction stormwater manuals from California and Nevada cited above, durable surfacing for construction travel ways is a typical BMP that was not addressed in JCEP's erosion control planning.

To control sediment discharge from the 229-mile construction access road and construction right-of-way, JCEP proposes to use a silt fence parallel to the ROW. The construction ROW with its construction access road on ridgetops above steeps slopes has numerous adjacent areas with zero order streams that would serve as a channel carrying sediment from the ROW to first order streams. For areas of concentrated flow such as a swale, a silt fence is not designed to treat concentrated flow nor treat silt or clays deeper than sheet or overland flow.[18, 19] Additionally, according to the U.S. Environmental Protection Agency cited above, a silt fence has limits on the drainage area it can treat. In its submittal, JCEP provides no evaluation for the drainage area for silt fences, and does not identify alternative means of managing flow where a silt fence is inadequate. Sediment discharge overland within 200 feet of a waterbody *or a swale connected to a waterbody* has the potential to discharge sediment to this water body.[20, 21] JCEP appears to have limited its analysis to roadways and other land disturbances within 200 feet of a perennial or intermittent stream.[22]

[18] Minnesota Stormwater Manual. *Sediment Control Practices – Check Dams (Ditch Checks, Ditch Dikes)*

[19] Washington State Department of Ecology. 2017. BMP CW233: Silt Fence. Stormwater Management Manual for Western Washington

[20] Brake, D.M., Molnau, and J.G. King. 1997. *Sediment Transport Distances and Culvert Spacing on Logging Roads with the Oregon Coast Mountain Range*. Presented at the 1997 Annual Internationa ASAE Meeting Mineapolis, NM. Paper No. IM-975018

[21] Megahan, W.F. and G.L. Ketcheson. 1996. Prediction Downslope Travel of Granitic Sediments from Forest Roads in Idaho. Water Resources Bulletin Volume 32, No. 2, pages 371-382

[22] See, e.g., DEIS at 4-101.

Figure 4: Examples of Convergent Headwalls

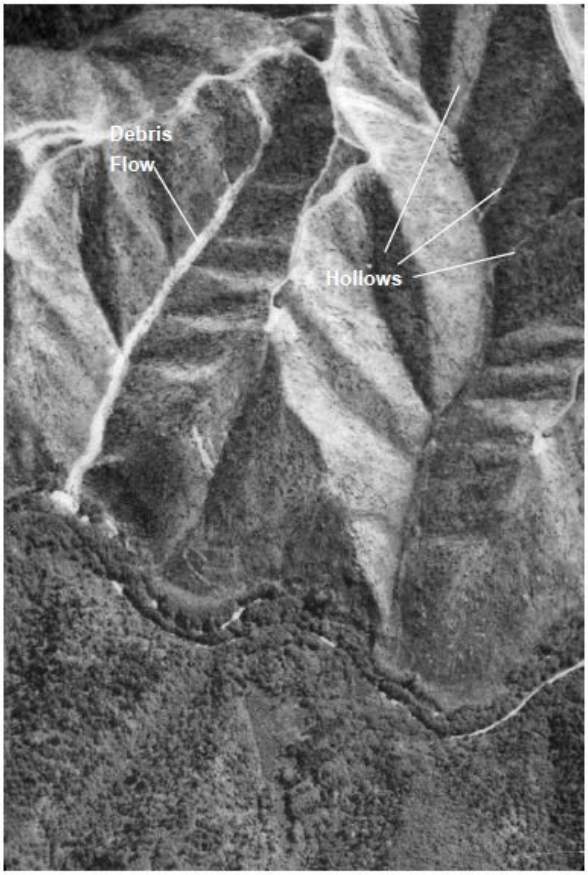


Figure 4a. Aerial View of a High Density of Bedrock Hollows in the Central Oregon Coast Range. This photo graph also shows a landslide in a bedrock hollow, triggered by a logging road, that transformed into a debris flow that deposited sediment into a larger stream. Source: Benda, Lee, Curt Veldhuisen, Dan Miller, Lynne Rodgers Miller. 1998. *Slope Instability and Forest Land Managers – A Primer and Field Guide*. Earth Systems Institute

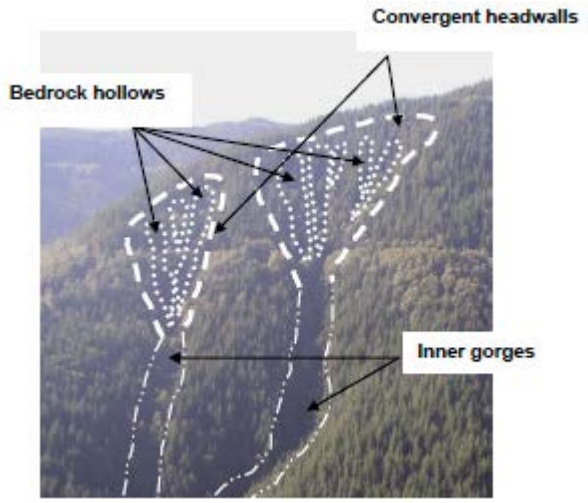


Figure 4b. Common hillslope relationship: bedrock hollows in convergent headwalls draining to inner gorges (photo and drawing by Jack Powell, DNR 2003). Source: Washington Department of Forestry. 2000. *Part 4. Characteristics of Unstable and Potentially Unstable Slopes and Landforms*. Forest Practices Board Manual

JCEP may also use biobags, straw wattles, and slash filter windrows to control sediment discharge from the construction ROW. According to the Minnesota and Washington manuals referenced above, check dams constructed of biobags and straw wattles are only moderately effective in trapping sediment and preventing channel erosion if properly spaced. Moreover, when used in a drainage swale according to the Minnesota manual, they provide only a secondary design benefit. Therefore, their application requires primary controls such as durable construction access road surfacing, stormwater management to avoid concentrated flows as well as other source controls. Additionally, JCEP would use slash filter windrows as a perimeter control for the construction right-of-way as indicated on JCEP's Environmental Alignment Sheets.

Slash filter windrows are typically placed on a contour at the toe of constructed road fill slopes to intercept sediment.[23] The research shows these windrows can reduce sediment leaving a fill slope by 75 to 85 percent

[23] Washington Department of Forestry. 2000. Forest Practices Board Manual

indicating that JCEP would need additional best management practices in a treatment train.[24] However, the literature does not indicate these controls are effective and designed for treating concentrated flows in rills, swales, and drainage channels arising from construction areas. JCEP has not provided information showing that forest slash when placed on soil surfaces dissected with rills, swales, and natural drainage channels would provide a continuous "seal" along the soil surface. Such a seal at the surface assures that a control measure for sheet runoff would trap suspended sediment. This seal at the soil surface may be achieved with a properly installed straw wattle countersunk into the soil. However, the rigid structure of forest slash would leave depressions from rills, swales, and channels below the windrow providing a path of least resistance for runoff and the sediment it carries.

In the Tyee Core Area, for example, JCEP proposes to place slash filter windrows below fill and spoils storage on headwalls. For example, in Drawing Number 3430.29-006 (Sheet 6 of 226) in the Environmental Alignment Sheets, JCEP proposes to use windrows on the border of the construction ROW where fill and/or grading spoils would be placed. JCEP would locate these windrows in a zero order stream below steep headwalls located along Pipeline Mileposts 8.56 to 8.75 (see Figure 5). These windrows and their construction stormwater discharged are directly connected to zero order streams (i.e., bedrock hollows) and, ultimately, first order streams. Absent supporting evidence demonstrating that the application of a slash filter windrow, by itself, is effective erosion control for these sensitive areas serving as conduits for first-order streams, DEQ finds this proposed method is insufficient to prevent violations of water quality. Additional information is required to demonstrate how construction stormwater would be managed above these sensitive areas.

As discussed above, JCEP proposes to use temporary slope breakers to concentrate and channel stormwater away from the construction ROW and construction access road. According to Burroughs (1990), research shows that rills and gullies resulting from concentrated road surface discharge reduces the effectiveness of mulch treatments on fill slopes and carries sediment long distances below these slopes. Burroughs (1990) also documents that uniform drainage from the road surface minimizes erosion on the fill slopes. In areas of steep slopes, JCEP is proposing to use temporary slope breakers (i.e., water bars) that – depending on its discharge point – would concentrate stormwater discharge onto fill slopes above slash filter windrows. These slash filter windrows are intended to manage sheet flow on fill slopes rather than concentrated flow from a temporary slope breaker.

In its December 20, 2018 supplemental information request, DEQ requested that JCEP use modeling to evaluate the efficacy of its proposed construction ROW BMPs to ensure JCEP is providing the highest and best treatment controls (see Page 1 – 2 of Attachment A). DEQ believes this modeling is essential to determining consistency with Oregon's statewide narrative water quality standard given the prevalence of steep slopes and zero order streams in close proximity to the construction ROW.[25] Models such as the Revised Universal Soil Loss Equation Version 2 (RUSLE2) are designed to evaluate the efficacy of BMPs proposed for concave, convex, and uniform slopes as well as cut and fill slope scenarios.[26] Practitioners of soil conservation have used versions of this model for decades. Moreover, Wisconsin requires comparable modeling for construction sites as a demonstration of compliance with a sediment performance standard.[27] JCEP has not performed an evaluation using RULSE2 or a comparable model to identify the most effective suite of BMPs given the site-specific conditions and constraints associated with its proposed activities.

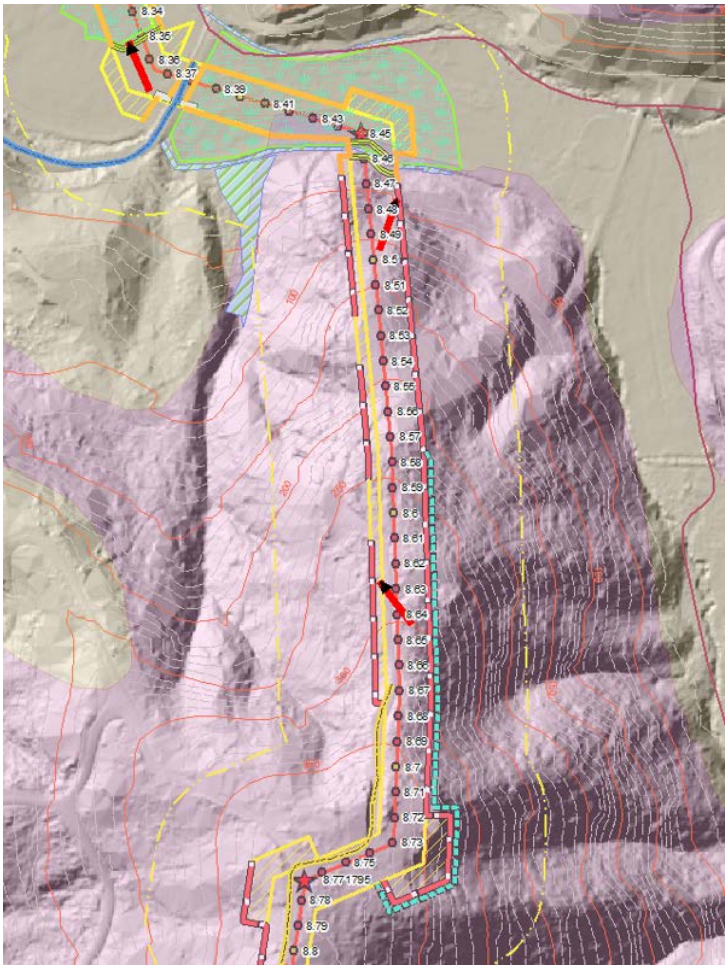
[24] Burroughs, E.R., Jr. 1990. *Predicting Onsite Sediment Yield from Forest Roads*. Proceeding of Conference XXI, International Erosion Control Association. Erosion Control: Technology in Transition. Washington, DC.

[25] See Attachment A, Page 1 and 2 of DEQ's December 20, 2018 Supplemental Information Request.

[26] USDA Natural Resource Conservation Service. Revised Universal Soil Loss Equation Version 2

[27] State of Wisconsin. 2017. *Construction Site Soil Loss and Sediment Discharge Calculation Guidance*. Bureau of Watershed Management Program Guidance, Wisconsin Department of Natural Resources. EGAD Number: 3800-2017-03

Figure 5: Spoil Placement on Headwalls for Construction ROW and TEWA 8.72-W between MP 8.56 – 8.75



Source: Pacific Connector Presentation at January 31, 2019 Meeting with DEQ.

Construction ROW Along Unstable Slopes

JCEP has not provided specific engineering drawings for its stormwater management system for the construction ROW and the 229-mile construction access road in areas of steep slopes and landslide susceptibility zones discussed below. JCEP is proposing to place grading spoils and, potentially, fill to level working surfaces, on geologically unstable slopes to support the 95-foot construction ROW including the Temporary Extra Work Areas (TEWAs). JCEP's Geologic Hazard Maps show geologically unstable slopes such as mapped landslides and rapidly moving landslide hazard areas in close proximity to the construction ROW.[28] The Oregon Department of Geology and Mineral Industries (DOGAMI) has documented landslide hazards in Oregon and, as discussed below, developed peer-reviewed procedures for identifying site-specific landslide hazards.[29] For example, the Tyee Core Area in Oregon's Coastal Range is an area of high landslide activity including both shallow and deep-seated landslides. The proposed pipeline traverses the Tyee Core Area from approximately Milepost 6 to 55. Research and technical references on slope stability are clear that land managers should avoid adding water or weight to unstable slopes and

[28] Appendix F, Geologic Hazards Maps for Pacific Connector Gas Pipeline. Part 2: Appendix C, Resource Report 6

[29] Oregon Department of Geology and Mineral Industries. Landslide Hazards in Oregon. State of Oregon

avoid cutting into unstable slopes without appropriate geotechnical engineering.[30, 31, 32, 33, 34] Oregon has seen other linear infrastructure development (i.e., roads, pipelines) initiate landslides, particularly in the Oregon coast range (State Highway 20, and Coos County Natural Gas Pipeline).[35]

Depending on the landslide type and proximity to streams, landslides can deposit substantial amounts of organic and inorganic debris into streams impacting the aquatic life dependent on these streams. Although landslides are a natural geomorphic process for streams in the Coast and Cascade Ranges, human-caused debris torrents affect water quality by changing the natural cycles of sediment delivery to stream systems.[36] For this reason as well as public safety, the Oregon Department of Forestry issued rules and technical guidance under the Oregon Forest Practice Act. The goal of these rules is to ensure forest operations such as road use and building do not initiate landslides.[37] As discussed in DEQ's December 20, 2018 supplemental information request (see Pages 13 and 19 of Attachment A), the Oregon Department of Forestry uses the Forest Practices Act rules to comply with Oregon water quality standards.[38] OAR 629-625-0200 provides that "operators shall avoid locating roads on steep slopes, slide areas, high landslide hazard locations, and in wetlands, riparian management areas, channels or floodplains where viable alternatives exist." OAR 629-625-0310(2)-(4) provides that "(2) operators shall end-haul excess material from steep slopes or high landslide hazard locations where needed to prevent landslides[;] (3) Operators shall design roads no wider than necessary to accommodate the anticipated use[;] (4) Operators shall design cut and fill slopes to minimize the risk of landslides[;] (5) Operators shall stabilize road fills as needed to prevent fill failure and subsequent damage to waters of the state using compaction, buttressing, subsurface drainage, rock facing or other effective means. Similarly, OAR 629-625-0330 includes other direction on management of drainage from forest land roads.

In the December 20, 2018 supplemental information request, DEQ provided JCEP with the basis for its concerns about slope stability along the ROW and the potential for pipeline ROW construction and ROW stormwater discharge to initiate landslides (see Pages 68 – 79 of Attachment A). DEQ also requested that JCEP use one of three slope stability models to objectively identify landslide risk areas and guide the siting of stormwater discharge points from slope breakers (i.e., water bars), the siting of grading and trench spoil storage, and design of fill on landslide susceptibility zones within or adjacent to the ROW. In preparation for a January meeting to discuss DEQ's comment, JCEP provided DEQ with several preliminary responses to DEQ's information request. These responses included a reference to a summary of JCEP's evaluation of slope stability in siting the pipeline alignment. DEQ's review of JCEP's landslide hazard assessment as presented in Resource Report 6 on Geologic Resources is summarized below.

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[30] Benda, L.E., Veldhuisen, C., Miller, D.J., and Rodgers-Miller, L. 2000. Slope instability and forest land managers: A primer and field guide. Seattle, Wash., Earth Systems Institute

[31] State of Washington. Forest Practices Board Manual. Section 16 Guidelines for Evaluating Potentially Unstable Slopes and Landforms

[32] Sidle, R.C. 1985. *Factors Influencing the Stability of Slopes*. Proceedings of a Workshop on Slope Stability: Problems and Solutions in Forest Management. USDA Forest Service. General Technical Report PN W-180

[33] Seaward, J.H. and T. Blackwood. 1998. Loading-induced Slope Failures on Bedding Planes in Sedimentary Geology of the Central Oregon Coast Range. In: Burns, S. (Editor), Environmental, Groundwater and Engineering Geology: Applications from Oregon. Belmont, California. Pages 497 – 506

[34] Hearn, G.J. 2011. Slope Engineering for Mountain Roads. Geological Society Engineering Geology Special Publication No. 24

[35] Hofmeister, R.J., D. J. Miller, K.A. Mills, J.C. Hinkle, A. Beier. 2002. Hazard Map of Potential Rapidly Moving Landslides in Western Oregon. GIS Layer for Local Governments in Implementation of Senate Bill 12. Interpretive Map Series IMS-22. Oregon Department of Geology and Mineral Industries

[36] Castro, Janine and Frank Reckendorf. 1995. Effects of Sediment on the Aquatic Environment: Potential NRCS Actions to Improve Aquatic Habitat. Working Paper No. 6. USDA Natural Resources Conservation Service

[37] Oregon Department of Forestry. 2003. *High Landslide Hazard Locations, Shallow, Rapidly Moving Landslides and Public Safety*: Screening and Practices. Forest Practice Technical Note Number 2

[38] Memorandum of Understanding between the Oregon State Department of Environmental Quality and the Oregon State Department of Forestry. April 16, 1998

Identification of Shallow Landslide Susceptibility

In Section 4.5.1 of Resource Report 6 (Geologic Resources), JCEP presents their three-phase methodology for a landslide hazard evaluation. Phase I involved an office review of geologic maps and publications, county and state hazard maps, Natural Resource Conservation Services soil surveys, topographic maps, LiDAR hillshade models, and stereo aerial photographs. Phase II involved an aerial reconnaissance, and Phase III involved a surface reconnaissance. In Section 4.5.2, JCEP clarifies its statements of risk in the landslide hazards evaluation report for Resource Report 6. For JCEP's hazard evaluation, risk only evaluated the potential for damage or failure of the pipeline from earth movements. JCEP's landslide hazard evaluation did not consider the risk of pipeline construction and operation initiating a landslide impacting water quality.

In Section 4.5.3.1, JCEP recognizes that rapidly moving landslides typically occur on steep slopes within zero order stream basins. In this section, JCEP notes that these landscape features can fail and generate a debris torrent that travels great distances along defined stream channels such a zero order streams and first order streams. DEQ provides examples of this type of unstable landscape feature in Figure 4 above.

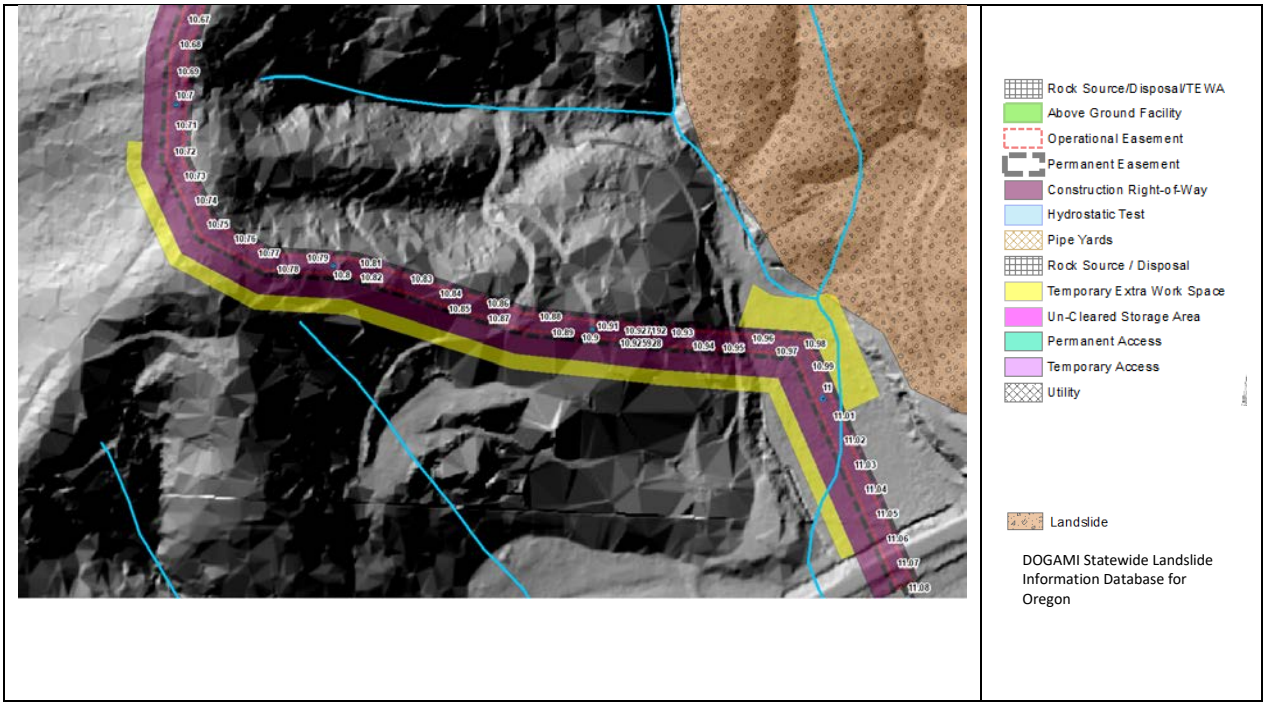
In the January 31, 2019 meeting to discuss the September 7, 2018 information request, JCEP presented a segment of the pipeline overlay on a Light Detection and Ranging Map (see Figure 5). This LiDAR map segment clearly shows the working side of the construction ROW with its construction access road and Temporary Extra Work Area above three headwalls (i.e., unstable slopes). As discussed above, these areas would support trenching and grading spoils and may require fill to level this working surface. The weight of the fill and/or trench and grading spoils, the anticipated traffic loads, and the stored material in combination with additional runoff due to the lack of a forest canopy present a substantial water quality risk to streams as well as a risk to worker and public safety.

Given its concern about slope stability above zero order streams, DEQ requested and received in February 2019 the LiDAR shapefiles used in their landslide hazard evaluation. DEQ performed a preliminary review of the LiDAR maps in a sample section of the Tyee Core Area and found many areas of concern. Two of these areas are illustrated below in Figures 6 and 7. DEQ searched for site-specific geo-engineering measures for fills and cuts on unstable slopes in information provided to-date by JCEP but found this information lacking as noted in DEQ's December 20, 2018 supplemental information request (see Page 70 – 73 and 75 to 79 of Attachment A).

Given the proposed placement of trench and grading spoils and, potentially, fill placed on the rapidly moving landslide risk area from Pipeline Milepost 8.56 to 8.75 (see Figure 5), DEQ reviewed Table B-3a in Resource Report 6 as a quality assurance check on JCEP's Phase I landslide hazard evaluation. Table B-3a summarizes the sites investigated in JCEP's Phase II field reconnaissance. In its review of this table, DEQ determined that JCEP did not include the area from between Milepost 8.56 to 8.75 in its field data collection and risk assessment. JCEP also did not conduct a surface reconnaissance for the areas of concern featured in Figures 6 and 7. Given this, DEQ referenced the methodology for identifying moderate and high rapidly moving landslide (RML) risks in Resource Report 6 as described below.

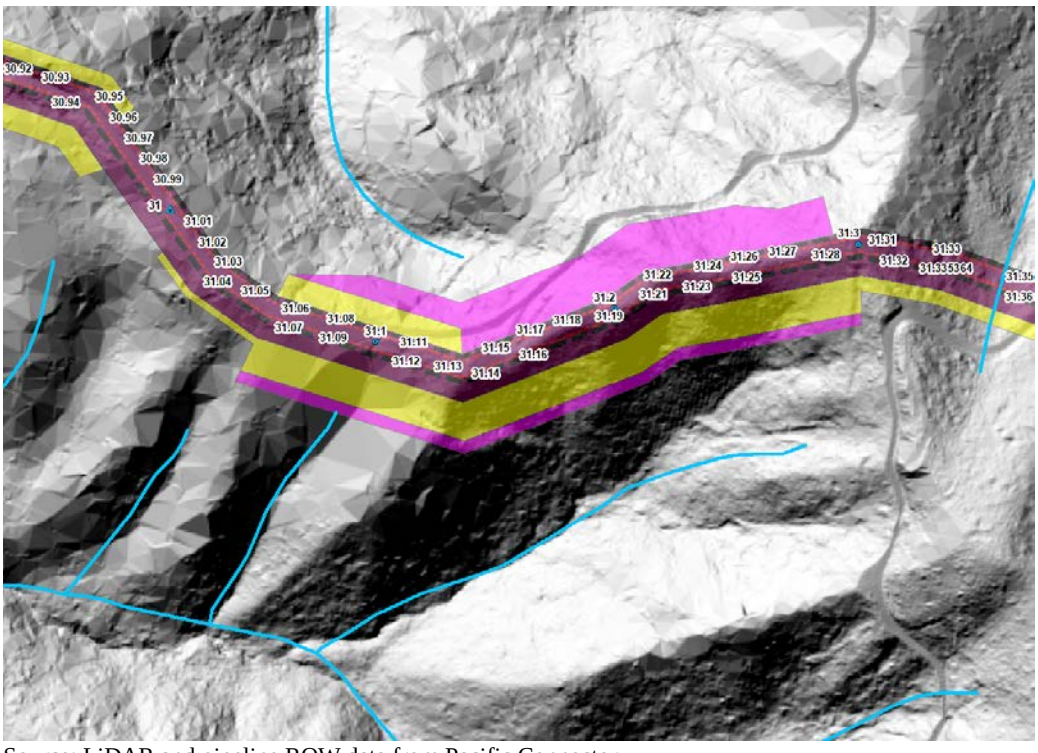
On Page 31 in Section 4.5.3.2 of Resource Report 5 (Geologic Resources), JCEP indicates it used LiDAR, 10-meter DEM, and aerial photography to identify moderate and high RML sites. This section provides the risk criteria JCEP used to identify the RML sites selected for surface reconnaissance and included in Table B-3a. JCEP's selection criteria was to identify the potential for a RML to induce strain on the pipeline and for RML erosion to expose a pipeline. These two selection criteria would not ensure the identification of RML sites posing a risk to streams and water quality. The above quality assurance check confirmed DEQ's concerns presented in the December 20, 2018 information request that JCEP's landslide hazard evaluation did not consider the landslide hazard risks to streams initiated by the construction and operational ROW.

Figure 6: Fill Placement on Headwalls for Construction Right-of-Way and TEWA 10.71-W MP 10.78 – 10.87



Source: LiDAR and pipeline ROW data from Pacific Connector

Figure 7: Fill Placement on Headwalls for Construction Right-of-Way and TEWA 31.06-W MP 31.07 – 31.28.



Source: LiDAR and pipeline ROW data from Pacific Connector

Landslide Hazard Evaluation

DEQ consulted with the Oregon Department of Geology and Mineral Industries (DOGAMI) to identify an accepted methodology for evaluating landslide susceptibility. DOGAMI provided DEQ with protocols for inventorying existing landslides, for mapping shallow landslide susceptibility, and for mapping deep-seated landslide susceptibility.[39] While regional studies of published landslide information such as DOGAMI's State Landslide Information Database for Oregon can be useful as a screening tool, in areas of high potential risk DOGAMI recommends a site-specific landslide evaluation.

For site-specific landslide hazard evaluations, DOGAMI considers the method in Special Paper 42 (SP-42) as state-of-the-practice.[40] To evaluate this protocol, DOGAMI compared remote sensing data for effectiveness in a pilot study.[41] Findings from this study indicate the use of LiDAR data resulted in 3 to 200 times the number of landslides identified compared to regional studies using already published information. A SP-42 landslide inventory results in an Arc-GIS format geodatabase of landslide data including landslide type, size, scarp height, estimated depth to failure plane, and confidence of identification. As noted below, the results from an inventory using this protocol support the identification of shallow-landslide and deep-seated landslide susceptibility zones to complete a landslide hazard assessment.

Using the SP-42 inventory, DOGAMI recommends following the procedure in Special Paper 45 (SP-45) to identify shallow landslide susceptibility maps.[42] DOGAMI is using this procedure to produce standardized shallow landslide maps for areas in Oregon. Use of a SP-45 map to identify shallow landslide susceptibility zones is necessary to reduce landslide risk through planning and engineering. For identifying deep-seated landslide susceptibility zones, DOGAMI recommends following the procedure in Special Paper 48 (SP-48).[43] Using the site-specific landslide inventory from SP-42, the procedure in SP-48 can assist in identifying and mitigating existing deep-seated landslides and slopes. The use of SP-42 in conjunction with SP-45 and SP-48 ensures identification of all the sites within and along the pipeline ROW where geo-engineering controls are needed to prevent spoil storage, cuts, and fills from pipeline construction and stormwater discharge from initiating landslides depositing organic and inorganic debris into streams.

BMPs to Mitigate Landslides

As discussed above and supported by references, JCEP's proposed activities create a significant risk of sediment transport to both perennial and intermittent streams. In Section 4.6.1 of Resource Report 6 (Geologic Resources), JCEP identifies two primary ways that pipeline construction methods would reduce slope stability and create a risk of sediment transport. Those are deep excavation perpendicular to the slope (i.e., creating a cut across a slope), and capturing and concentrating stormwater along the ROW and discharging this stormwater to potentially unstable slopes. Placing fill on a headwall is a third way that pipeline construction would reduce slope stability.

In Section 4.6.2 of Resource Report 6, JCEP states that it would engineer fill slopes constructed at gradients of 30 percent or greater to ensure long-term slope stability. JCEP states that it would identify side-slope ROW construction segments on steep slopes during the final design phase for this project. In its December 20, 2018 supplemental information request, DEQ reviewed and noted the deficiencies in the conceptual BMPs with regard to JCEP's Erosion Control and Revegetation Plan (see Pages 76 – 77 of Attachment A).

[39] Wang, Yumei. March 20, 2019. Email to Chris Bayham Regarding DOGAMI SLIDO Data.

[40] Burns, William, J and Ian P. Madin. 2009. *Protocol for Inventory Mapping of Landslide Deposits from LiDAR Imagery*. Special Paper 42. Department of Geology and Mineral Industries. State of Oregon

[41] Burns, W.J. 2007. Comparison of Remote Sensing Datasets for the Establishment of a Landslide Mapping Protocol in Oregon. AEG Special Publication 23: Vail, Colorado, Conference Presentations. First North American Landslide Conference

[42] Burns, W.J., Ian P. Madin, and Katherine A. Mickelson. 2012. *Protocol for Shallow-Landslide Susceptibility Mapping*. Special Paper 45. Department of Geology and Mineral Industries. State of Oregon

[43] Burns, William J and Katherin A.Mickelson. 2016. Protocol for Deep Landslide Susceptibility Mapping. Special Paper 48. Department of Geology and Mineral Industries. State of Oregon

In Section 4.6.2.1 of Resource Report 6, JCEP references its Erosion Control and Revegetation Plan for BMPs to manage surface water and groundwater near unstable slopes. For BMPs to address stormwater near steep slopes, JCEP identifies the use of temporary and permanent slope breakers (i.e., water bars). As discussed above in this Evaluation and Findings Report, slope breakers concentrate stormwater in an excavated channel in front of a berm (see Resource Report 1, Drawing Number 3430.34-X-0008). Runoff would substantially increase after JCEP removes the forest and shrub canopy and herbaceous vegetation. During construction and for several years post-construction, the drainage area for each temporary slope breaker is the 95-foot wide construction ROW and the 100 feet of ROW to the next temporary slope breaker based on FERC's spacing requirements. JCEP has not provided DEQ with the location of the discharge points for the concentrated flow in temporary slope breakers near unstable geologic features. Without additional BMPs near unstable slopes, temporary slope breakers increase the likelihood for this discharge to reduce slope stability identified by JCEP and highlighted above.

Without more developed information about the extent of areas of landslide risk and BMPs, DEQ is unable to determine what engineering controls for the design and construction of the pipeline are both feasible and reasonably likely to succeed in keeping waste materials out of public waters and minimizing erosion of cut banks, fills, and road surfaces. DEQ also is unable to determine whether JCEP can or would utilize the highest and best practicable treatment and/or control of wastes, activities, and flows so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor, and other deleterious factors at the lowest possible levels. As a result, DEQ concludes that it is unable to determine that JCEP's proposed activities would be conducted in a manner that would not violate the statewide narrative criteria in OAR 340-041-0007.

6.1.2.2 Waterbody Crossings

JCEP's proposal to install a pipeline across streams does not exhibit the highest and best controls, does not demonstrate that these improvements would minimize the erosion of and discharge of inorganic and organic debris, turbid flows, and sediment from cut banks, fills, and road surfaces. Pipeline construction would affect about 352 waterbodies.[44] JCEP would install the pipeline below the stream bed of waterbodies using either trenchless methods (conventional bore, horizontal directional drill, or Direct Pipe® technique) or dry open–cut methods (diverted open cut, fluming, dam-and-pump) techniques. An evaluation of the potential water quality impacts of these waterbody crossing procedures is provided below.

Trenchless Waterbody Crossings – Horizontal Directional Drill

JCEP proposes to use the horizontal directional drill method for two crossings under the Coos Bay Estuary (MPs 0.3–1.0 and 1.5–3.0) and crossings of three major waterbodies (Coos River at MP 11.1R; Rogue River at MP 122.7; and Klamath River at MP 199.4). DEQ describes the horizontal directional drill method in section 5.2 of this report. JCEP prepared a HDD Feasibility Report that includes geotechnical engineering, recommendations, and HDD design criteria for the three proposed HDD river crossings. The report also includes a feasibility analysis of completing a HDD crossing beneath Coos Bay estuary. However, JCEP's consultant states that the "* * *feasibility evaluation of the proposed Coos Bay East HDD is based on limited subsurface data. Our conclusions should be considered preliminary pending completion of a subsurface exploration program. Resource Report 2, Appendix G.2. The feasibility analysis generally finds a low risk of drilling fluid releases. However, at the east end of the crossing approaching Kentuck Slough there is a high risk of hydraulic facture and drilling fluid surface release. Resource Report 2, Appendix G.2., at 9. The evaluation identifies potential mitigation for this risk, but it is unclear what specific mitigation measures JCEP is currently proposing.

On March 11, 2019, DEQ requested additional information to confirm the proposed HDD routes beneath the Coos

[44] There is some inconsistency between FERC's DEIS, DEIS at 2-60, which states that the pipeline would cross 352 waterbodies and Pacific Connector Gas Pipeline Resource Report 2, Appendix 2/A.2-2. September 2017, which provides that the number of crossings would be 326. DEQ has not, as this time, been able to determine the reason(s) for the discrepancy, and uses the more recent figure of 352 from the FERC DEIS here.

Bay estuary, the drilling fluid containment plans, the response procedures, and other information. As of the date of preparation of this report, DEQ had not received formal responses to this request. It is possible that some or all of this information was included in the materials submitted to DEQ on April 30, 2019. However, the timing of that submission did not provide any meaningful opportunity for DEQ review. Accordingly, because the available information evaluated to-date does not adequately characterize the proposed activities and mitigation measures, or the potential effects on water quality, DEQ cannot conclude there is a reasonable assurance that the proposed HDD crossings of the Coos Bay estuary would be conducted in a manner that would not violate the statewide narrative criteria in OAR 340-041-007.

Open Cut Waterbody Crossings

JCEP would perform dry open-cut crossing procedures at most waterbody crossings that are flowing at the time of construction (conventional trenching would be used to cross intermittent streams without flow). Both fluming and pumping methods rely on isolating a stream section with temporary dams, dewatering the work area, and bypassing flow around the isolated work area. Upon completion of pipeline installation activities JCEP proposes to restore waterways and embankments using the restoration and revegetation procedures discussed in the Erosion Control and Revegetation Plan.

The following proposed actions of the JCEP are evaluated for compliance with the Statewide Narrative Criteria:

Stream Crossings and Restoration:

To reduce impacts, JCEP proposes to complete these stream crossings in dewatered areas isolated from normal streamflow using temporary dams. JCEP's Stream Fluming Procedures and Dam and Pump Procedures describe the method for removing the flume upon completion. Upon removal, JCEP expects that short-term turbidity "could increase considerably" as the "streambed flushed clean of sediments left over from construction".[45, 46] DEQ has identified three waterbody crossings that are listed on the DEQ's 2012 303(d) list as impaired for sedimentation (S. Fork Little Butte Cr., MP 162.45; Spencer Cr. MP 171.07; Clover Cr. MP 177.76). In these particular areas, any increase in sediment loading is prohibited, at least until completion of a Total Maximum Daily Load that includes an allocation for the proposed activity, or until completion of an implementation plan that demonstrates that increased loading would be avoided. Under a Clean Water Act Section 404 Permit, DEQ would allow limited duration turbid discharges, but only if the project applies all practicable turbidity controls to minimize these discharges. JCEP's proposed methodologies include dewatering of construction areas, and dewatering and removal of temporary dams. JCEP has not presented how it would minimize sediment and turbid discharges during these activities.

DEQ's information request dated March 11, 2019, requested specific waterbody construction and restoration plans for stream crossings involving an open trench cut. These plans are necessary to demonstrate that JCEP has considered all construction concerns and constraints, restoration design alternatives, and selected the highest and best treatment alternatives to minimize pollution discharge in compliance with provisions of Oregon's Statewide Narrative Criteria. The importance of careful, detailed, site-specific planning for pipeline crossing construction and stream restoration is well-documented in the construction of the Ruby Pipeline. In the Ruby Pipeline project, a team of experts developed an approach to minimize impacts at 849 stream crossings.[47] DEQ's March 11, 2019 information request is consistent with the approach used in the Ruby Pipeline project.

Detailed construction planning is important for water quality protection. For example, on steep unstable slopes, a dewater structure can saturate the area round the structure creating a positive soil pore pressure. A positive soil pressure can destabilize a slope causing a small slope failure that discharges a debris flow into a stream. In addition, on steep slopes, spoils from trenching can discharge sediment to the stream if JCEP does not properly site

[45] September 2017. Stream Fluming Procedures. Pacific Connector Gas Pipeline. Appendix C.2 Resource Report 2

[46] September 2017. Dam and Pump Procedures. Pacific Connector Gas Pipeline. Appendix D.2 Resource Report 2

[47] Castro, J.M., A. MacDonald, E. Lynch, and R. Thorne. 2014 *Risk-based Approach to Designing and Reviewing Pipeline Stream Crossings to Minimize Impacts to Aquatic Habitats and Species*. River Research and Applications

these spoils and prevent the decant water with suspended sediment from discharging into the stream. In fact, on page 10 of JCEP's Stream Fluming Procedures, the drawing in Figure 8 of these procedures show turbid discharges of decant water from spoils placed on the construction access road and right-of-way discharging into the stream channel. This would constitute a violation of DEQ's NPDES 1200-C General Construction Stormwater Permit. Moreover, documenting and restoring the bankfull width and depth is important to avoid aggradation in front of the crossing or stream incision below the crossing.[48] DEQ has not yet received the requested plans. For this reason, DEQ cannot determine at this time that there is a reasonable assurance that the proposed action would be conducted in a manner that would not violate OAR 340-041-0007(1).

Dewatering Discharge:
JCEP describes general procedures for dewatering work areas during dry open-cut waterbody crossings. These methods rely on upland containment areas to promote sediment settling and infiltration of the turbid discharge. JCEP expects to site these structures in areas that can infiltrate the overflow from the dewatering structure into the surrounding area.

Discharging water to upland areas can locally saturate shallow soils causing slope failure and mass movement. DEQ identified several crossing locations where existing terrain and soil conditions may cause slope instability. For example, the pipeline alignment crosses Steinnon Creek at two locations, at MP 20.02BR, and 24.32BR. Steinnon Creek is a Level 0 stream and is upstream of spawning and rearing habitat for Endangered Species Act (ESA) listed Coho salmon. In Table B.3-4, JCEP notes steep topographic conditions for this reach near Milepost 20.20BR. Roering et al. (2005) and JCEP's Geologic Hazard Map (see Figure 5 of 47) identify contrasting steep and dissected terrain and a bench-like, low gradient form adjacent to this reach suggesting remnants of a deep-seated landslide and therefore an unstable slope. Steinnon Creek is crossed again at MP 24.32BR using a dry open cut procedure. The slopes adjacent to this crossing are landslides 126 and 127 identified from the Department of Geology and Mineral Industries Open File Report. JCEP has not provided DEQ with the proposed location of each dewater structure and the number of these structures for each crossing. JCEP has not presented the maintenance schedule for these dewater structure. DEQ noted additional crossing locations characterized by aquatic habitat value and steep, potentially unstable hillsides.[49]

The pipeline alignment is located in portions of the Tyee Core Area of the Oregon Coast Range characterized by steep hillsides and shallow rapidly moving landslides. To reduce the risk of landslides, the Oregon Department of Forestry recommends not discharging water or placing material on or near headwall areas. JCEP's general waterbody crossing procedures do not include site-specific information necessary to conclude that JCEP would would site and operate the dewatering structures to prevent turbid discharge, sediment discharge, and debris flows into streams. On March 11, 2019, DEQ requested information on dewatering procedures, spoil placement locations and monitoring procedures. DEQ requests this information to confirm that dewatering activities would not cause turbid discharge, sedimentation, or a discharge of organic or inorganic deposits to receiving waters as prohibited by Oregon's Statewide Narrative Criteria. DEQ has not received responses from JCEP. For this reason, DEQ also cannot find reasonable assurance that the proposed activities would be conducted in a manner that would not violate OAR 340-041-0007(1) and (11).

6.1.2.3 Road Construction and Maintenance

During pipeline construction, JCEP proposes to improve and maintain several hundred miles of existing access roads. Pipeline construction would also require the development of 25 segments of Temporary Access Roads and Permanent Access Roads. JCEP proposes to decommission the Temporary Access Roads after pipeline construction is complete, while the Permanent Access Roads would remain in use during pipeline operation. Oregon's Statewide Narrative Criteria include measures to prevent or minimize the discharge of pollutants from impacting waterbodies.

[48] Simon, Andrew, Sean J. Bennett, and Janine M. Castro. 2011. *Stream Restoration in Dynamic Fluvial System: Scientific Approaches, Analyses, and Tools*. Geophysical Monograph 194. American Geophysical Union, Washington, DC

[49] See waterbody crossings at mileposts 34.46, 44.21, 55.71, 55.90, 55.94, 56.28, 56.34, 57.11, and others.

DEQ's evaluation of the anticipated effects of JCEP's road maintenance and construction is presented below.

Existing Access Roads

JCEP proposes to use approximately 660 miles of existing access road to construct the pipeline. JCEP identifies numerous miles of these existing access roads as gravel, dirt, rock, and pit run surfaced roads. As presented on Drawing Number 3430.31-Y-Map 1 through 34 of the submittal, many of these access roads traverse steep slopes and landslide hazard areas that are in close proximity to zero order streams discussed above.

During wet weather, the existing roads would experience traffic loads moving heavy equipment, logs, and construction overburden (e.g., soil, rock, slash) during the preparation for and the construction of the pipeline. Unpaved roads require careful attention to the selection of construction design and maintenance standards to support their anticipated traffic loads. Proper selection of design standards for road surfaces prevent the failure of these surfaces under traffic loads. Heavy traffic on unstable road surfaces can result in sediment discharge to streams during wet weather. [50, 51]

JCEP would use both existing privately-owned and public access roads to clear trees from the construction right-of-way, Temporary Extra Work Areas, and other areas necessary for building and operating the pipeline. Tree harvesting on non-federal lands would require compliance with Oregon's Forest Practices Act (FPA) rules. Oregon Department of Forestry (ODF) administers these FPA rules. FPA rules regulate road construction and maintenance on privately owned roads during forest harvesting operations in wet weather. [52, 53, 54] ODF uses the FPA rules to ensure forest operations comply with water quality standards such as OAR 340-041-0007(1), (7), and (11). [55]

Maintenance Standards for Public and Private Roads

Tree harvesting and pipeline construction would also require compliance with road construction and maintenance standards for the U.S. Department of Agriculture Forest Service and U.S. Department of Interior Bureau of Land Management. These Forest Service and BLM standards include potential BMPs that could help assure compliance with the Statewide Narrative Criteria for road building and maintenance. These construction and maintenance standards would also help asssure compliance with the turbidity water quality standard discussed in Section 6.10 of this report. When DEQ lists waterbodies as water quality limited (not meeting standards) on the Clean Water Act 303(d) list, these two federal agencies develop Water Quality Restoration Plans (WQRP) to guide Forest Service and BLM actions to protect water quality standards. [56, 57, 58] In its December 20, 2018 supplemental information request, DEQ provided JCEP with an example WQRP for the South Umpqua. This WQRP identified roads as a source of sediment from erosion (see Page 43, Attachment A).

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[50] Grace III, J.M. and Clinton, B.D. 2007. Protecting Soil and Water in Forest Road Management. USDA Forest Service/University of Nebraska-Lincoln Faculty Publication Volume 50(5):1579-1584. 2007 American Society of Agricultural and Biological Engineers ISSN 0001-2351

[51] Furniss, M.J., T.D. Roelofs, and C.S. Yee. 1991. *Road Construction and Maintenance*. American Fisheries Society Special Publication 19:297-323

[52] Oregon Department of Forestry. 2003. *Wet Weather Road Use*. Forest Practice Technical Note Number 9

[53] Oregon Department of Forestry. 1999. *Road Maintenance*. Forest Practices Technical Note Number 4

[54] Oregon Department of Forestry. 2003. *Installation and Maintenance of Cross Drainage Systems on Forest Roads*. Forest Practice Technical Note Number 8

[55] Memorandum of Understanding between the Oregon State Department of Environmental Quality and the Oregon State Department of Forestry. April 16, 1998

[56] *Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters* (May 1999, Version 2.0)

[57] Memorandum of Understanding Between United States Department of Interior Bureau of Land Management and the State or Oregon Department of Environmental Quality to Meet State and Federal Water Quality Rules and Regulations. BLM Agreement Number BLM-OR930-1702

[58] Memorandum of Understanding Between State of Oregon Department of Environmental Quality and the USDA, Forest Service Pacific Northwest Region. OMB 0596-0217, FS-1500-15

In addition, in this supplemental information request, DEQ provided JCEP with example requirements from the Forest Service regarding road maintenance (see Page 30 of Attachment A). These Forest Service requirements stem from the Forest Service Handbook and provide JCEP with water quality BMPs in the form of design and maintenance standards for unpaved roads on federal forestlands. In its October 25, 2018 response to DEQ's September 7, 2018 information request, JCEP referred DEQ to Table A.8-1 in Part 2 of Appendix B of it submittal. In DEQ's December 20, 2018 supplemental information request, DEQ reviewed Table A.8-1. In its review, DEQ highlighted the lack of information on maintenance treatments and needed road improvements in this table (see Page 41 – 42 of Attachment A).

Once tree harvesting is complete, JCEP proposes to grade a construction right-of-way including a construction access road for trenching and pipe laying equipment. This construction access road would require a durable surface to support heavy traffic loads. As discussed and referenced above in Section 6.1.2.1 on Pipeline Construction, a durable road surface prevents fine soil particles from being pushed to the road surface and carried by stormwater to drainage swales along the construction right-of-way. This durable surface as well as its stormwater management system would require monitoring and periodic maintenance to avoid erosion and subsequent sediment discharge to, for example, zero order and first order streams on ridge tops and along steep slopes. JCEP has not provided DEQ with information demonstrating that this monitoring would occur nor information on how JCEP would perform maintenance on this construction access road as well as existing access roads.

Planning for Erosion Control

JCEP proposes to use its Transportation Management Plan and Erosion Control and Revegetation Plan to identify BMPs for road construction and maintenance to minimize erosion of road cut slopes, fills, and surfaces. In reviewing these plans do not address, DEQ found no demonstration of compliance with the Oregon Forest Practice Act's road construction and maintenance requirements for non-federal, privately owned forest road segments. hydrologically connected to streams. Additionally, DEQ did not find County, Forest Service, BLM, and Bureau of Reclamation road construction and maintenance standards for unpaved road hydrologically connected to streams. In fact, a As noted in the December 20, 2018 information request (Pages 20-22 of, Attachment A) , DEQ found blank pages in the Appendices. JCEP referenced these pages in the Transportation Management Plan as containing information on JCEP's road operation and maintenance actions. Finally, DEQ did not find any discussion of the 229-mile construction access road and JCEP's maintenance plan to protect water quality while operating this road during pipeline construction.

Given this missing information, DEQ requested that JCEP provide a detailed maintenance and improvement plan for existing access roads in its September 7, 2018 information request (see Page 8 of 15 of Attachment B). DEQ also requested JCEP inventory the existing access roads to identify unpaved road segments needing improvements to support anticipated traffic loads and to ensure compliance with Forest Practices Act rules. DEQ requested that JCEP's road maintenance and improvement plan use road assessment protocols such as the Geomorphic Road Assessment and Inventory Package (GRAIP) to evaluate the potential for road surface erosion risk, gully risk, and landslide risks along the existing access roads.

In an October 25, 2018 response to these requests, JCEP indicated it would provide DEQ with a revised Table A.2-6 from Appendix A.2 of Resource Report 2 identifying BMPs for water bodies crossed by or within 100 feet of Temporary and Permanent Access Roads. In its December 20, 2018 supplemental information request, DEQ informed JCEP that lists of generic BMPs in a summary table were not responsive to DEQ's concerns regarding traffic loads on existing access roads (see Pages 40 – 41 of Attachment A). DEQ requested specific design and maintenance standards and specification by road ownership. DEQ also noted that JCEP's selection criteria for existing access roads in its inventory was not acceptable. More specifically, limiting the inventory to road segments that cross by or within 100 feet of a perennial or intermittent stream would not capture many existing access road segments that are hydrologically connected to streams. As one example, a road segment may be several hundred feet from a stream but still discharge sediment from its road surface if it has an in-slope drainage ditch with no cross drains. If its road surface is unstable during wet weather, a ditch with this design would discharge sediment

directly to a stream. Given these concerns, DEQ requested that JCEP use models such as GRAIP or the Washington Road Surface Erosion Model (WARSEM) to evaluate its proposed use of road segments. These models provide detailed protocols for determining which unpaved road segments are hydrologically connected to a stream.

In a January 2019 meeting and a February 20, 2019 response, JCEP proposed using WARSEM to perform the DEQ-requested inventory of unpaved roads to develop the DEQ-requested road maintenance and improvement plan.[59] During further discussions in conference calls, JCEP proposed to perform a Level I Inventory in WARSEM of existing access roads. A Level I Inventory is a desktop analysis using maps. In Section 4.3.2.2 of the Draft Environmental Impact Statement (DEIS) for this project activity (see Page 4-102), JCEP concludes that only 21 existing access roads could potentially deliver sediment to streams. As explained below, this conclusion is clearly erroneous given the numerous road-stream interactions in areas traversed by the construction right-of-way and given the procedures for determining hydrologic connectivity in a road system.

As a sample of road-stream intersections in the highly dissected drainage basins of the Coast and Cascade Ranges, Figure 8 shows the number of BLM road-stream crossings in just one of numerous subwatersheds where the construction ROW is located. This map does not include cross drains for roads that are also within 200 feet of a stream and, therefore, hydrologically connected to this stream. If a field inventory included cross drains, the number of road-stream interactions on this map would be greater than currently displayed in Figure 8. Many of the BLM roads depicted in the map below would serve as an existing access road for pipeline construction. Given this small area, JCEP's estimate of 21 existing access roads that could potentially deliver sediment is a significant underestimation.

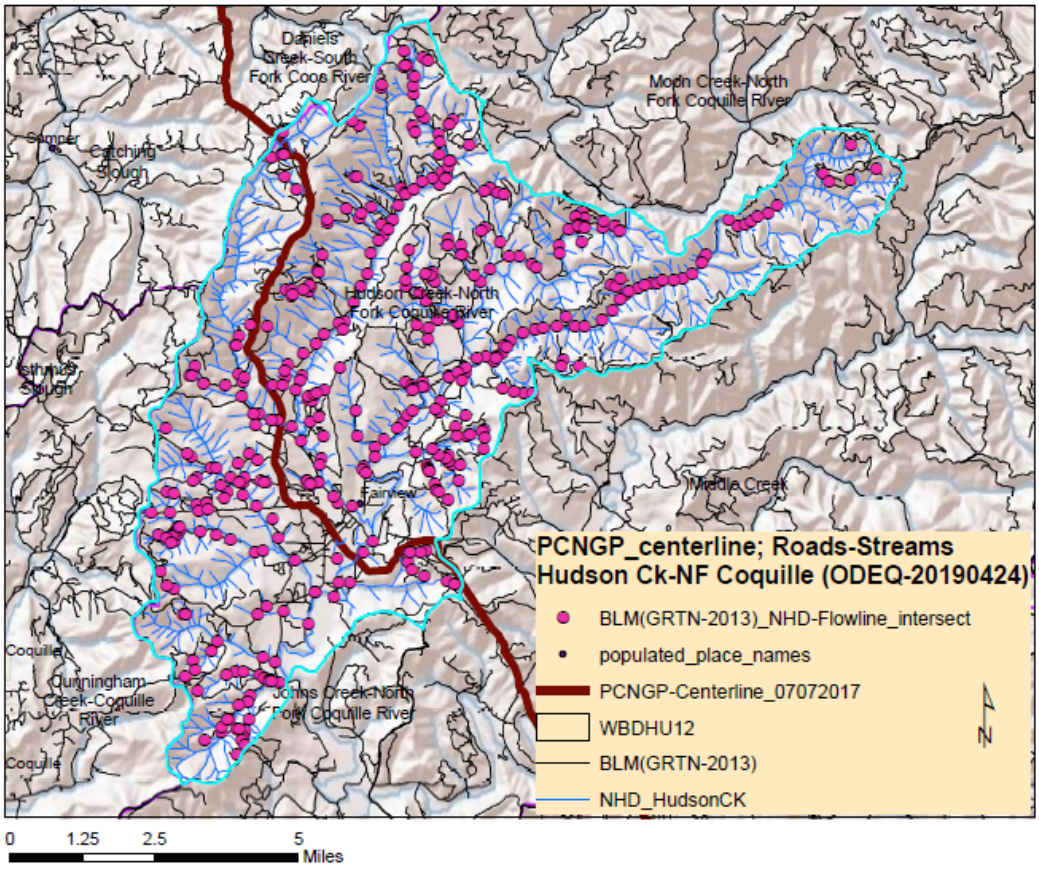
DEQ informed JCEP during the January 2019 meeting and subsequent conference calls that JCEP needed to perform an inventory of all roads segments to identify those hydrologically connected to streams. These road segments using maps during a desktop analysis. In Table 2 of the WARSEM Manual, the authors of this model clearly indicate that a determination of hydrologic connectivity requires field verification. As a result, DEQ requested a Level IV Inventory using WARSEM as this allows JCEP to document the erosion reduction from road surfaces using JCEP's maintenance and improvement plan. JCEP's conclusion that only 21 existing access roads have the potential to discharge sediment to streams is based upon road system surveys using aerial photos, maps, or other remote sensing tools. Remote sensing tools cannot serve as a substitute for a field inventory as explained below.

For example, JCEP cannot determine using maps if the surface of a road segment is out-sloping and, therefore, draining overland via the road's fill slope and undisturbed landscape. In addition, maps cannot indicate if the surface of a road segment is in-sloping and draining to a ditch carrying stormwater to a stream over several hundred feet or more downslope from this road segment. Moreover, maps cannot indicate if a road surface drains to an in-slope ditch that drains to a cross culvert (or drain) which discharges to a zero order stream connected to a first order stream. Given this, JCEP's desktop analysis of road segments is making significant assumptions that incorporate considerable error into its estimate of the number and location of road segments hydrologically connected to streams.

Such errors place surface water quality at risk from unpaved roads discharging sediment from their surface if JCEP does not maintain or improve these roads to support the anticipated traffic loads. To eliminate these errors, a WARSEM inventory protocol requiring field verification such as a Level IV Inventory or comparable analysis must be used. Further, development of a Transportation Management Plan for nonfederal roads is also required (the TMP in the 401 submittal did not discuss these roads).

[59] Dube, Kathy, Walt Megahan, and Marc McCalmon. 2004. *Washington Road Surface Erosion Model*. State of Washington Department of Natural Resources.

Figure 8: Map of Hudson Creek-North Fork Coquille Subwatershed



Road Construction

JCEP's proposed improvements of access roads include the widening of roads, the recommissioning of roads, the installation and removal of a temporary bridge, the development of turnouts, replacement of culverts at stream crossings, and the installation and removal of a temporary culvert at a stream crossing. JCEP would also build 25 segments of Temporary Access Roads and Permanent Access Roads. These proposed improvements and additions involve land disturbance that may lead to sediment and turbid discharges to streams and wetland depending on the site constraints at each improvement (Furniss et al. 1991). In Table 1.2-1 of Resource Report 1, JCEP estimates that road improvements would disturb 22.70 acres. On September 7, 2018, DEQ requested designs and specifications for these improvements and for the new roads. JCEP has not provided DEQ with the requested information regarding these improvements.

Road improvement designs and specifications as well as plan drawings showing constraints such as landslide susceptibility zones, sensitive receptors such as streams and wetlands, and BMPs are not available for DEQ to review and evaluate at this timeIn Section 1.3.4 of JCEP's Resource Report 1, JCEP notes that it would not conduct civil surveys to prepare engineering designs until the fourth quarter of 2019 for the road improvements. JCEP has only provided the general location of erosion controls proposed for the construction right-of-way on the Environmental Alignment Sheets submitted with JCEP's NPDES 1200-C Permit Application. These do not provide the engineering detail necessary to describe how JCEP would manage and treat stormwater from improved and new roads. The information submitted to date does not provide the engineering detail sufficient to describe how JCEP would stabilize road cut and fill slopes in landslide susceptibility zones.

Additionally, DEQ has not received the 1200-C required erosion control and sediment plan for these improvements to evaluate their compliance with Permit Schedule A.8.b on prevention of earth slides and A.10 on water quality

standards. In its December 20, 2018 supplemental information request (see Pages 46 – 50 and Page 80 of Attachment A), moreover, DEQ provided JCEP examples of new roads where JCEP did not provide design information, drawings, or site-specific BMPs. In providing these examples, DEQ identified its water quality concerns and the information DEQ needed to evaluate JCEP's actions to control road construction actions and road design elements that can lead to sediment and turbid discharges to streams.

As discussed in more detail above, when widening existing access roads, JCEP would cut into and the place fill on steep and/or unstable slopes. These proposed actions can initiate landslides discharging turbid flows and sediment with organic matter into zero order streams (i.e., bedrock hollows) as depicted in Figures 6 and 7. [60] DEQ detailed the potential water quality impacts of road construction and the deficiencies in JCEP's submittal in DEQ's December 20, 2018 supplemental information request (see Pages 18 – 25 of Attachment A). For example, while excavating a culvert from a stream crossing, sediment and fine soil particles generating turbid flows can discharge into streams and riverine wetlands. However, JCEP has not detailed how JCEP would address these discharges. JCEP's reliance on an Environmental Inspector to ensure effective sediment and turbidity controls during the construction process does not provide DEQ a reasonable assurance that the proposed activities will be conducted in a manner that will not violate the statewide narrative criteria.

In addition, JCEP must prepare for wet weather with an erosion and sediment control plan. Ten percent of the rain falls in the summer in Southwestern Oregon. [61] Although the probability is considerably lower, rain does occur during Oregon's in-water work period. Culvert replacements may involve the removal of substantial amounts of fill depending on the topography and road alignment relative to this topography. For its proposed culvert replacements projects, JCEP has not provided plans for locating and managing large stockpiles of excavated fill to avoid sediment and turbid discharges while JCEP installs a new culvert.

For culvert replacement projects, JCEP may clear riparian vegetation and grub their stumps from the soil adjacent to stream crossing approaches to create space for the crossing's footprint. These actions can discharge turbid flows and sediment to streams as well as increase thermal loading from the loss of riparian shade. JCEP has not documented these impacts or demonstrated what BMPs JCEP would deploy and where. Road recommissioning may involve the removal of water bars (i.e., slope breakers), reshaping the unpaved road surface to manage drainage, and reshaping drainage ditches. These land disturbing actions also can lead to sediment discharges and turbid flows into streams and wetlands during wet weather. If a decommissioned road was restored to approximate the natural contours, recommissioning may involve substantial regrading to create a travel way. This regrading may involve the development of cut and fill slopes on steep slopes and/or unstable slopes requiring geotechnical engineering to prevent landslides altering the roads' drainage system and leading to sediment and turbid discharges during wet weather.

JCEP presents it the Erosion Control and Revegetation Plan and Transportation Management Plan with their BMPs as its approach for managing water quality impacts from roads. DEQ reviewed these plans and identified their deficiencies in its December 20, 2018 supplemental information request (see Pages 10 – 25 of Attachment A). Based on DEQ's evaluation, JCEP's proposed access road improvements do not exhibit the highest and best controls, do not demonstrate that these proposed BMPs would minimize the erosion of and discharge of inorganic and organic debris, turbid flows, and sediment from cut banks, fills, and road surfaces.

6.1.2.4 Post-Construction Operation and Maintenance of Pipeline Right-of-Way

On steep slopes and near stream crossings, JCEP proposes to use permanent slope breakers to manage post-construction stormwater on the permanent ROW in compliance with 2013 FERC guidelines.[62] As discussed in Section 6.1.2.1 of this Evaluation and Findings Report, slope breakers (i.e., water bars) concentrate stormwater and

[60] Hearn, G.J. 2011. Slope Engineering for Mountain Roads. Geological Society Engineering Geology Special Publication No. 24

[61] National Climate Data Center. 2006. *Climate in Oregon*. National Oceanic and Atmospheric Administration

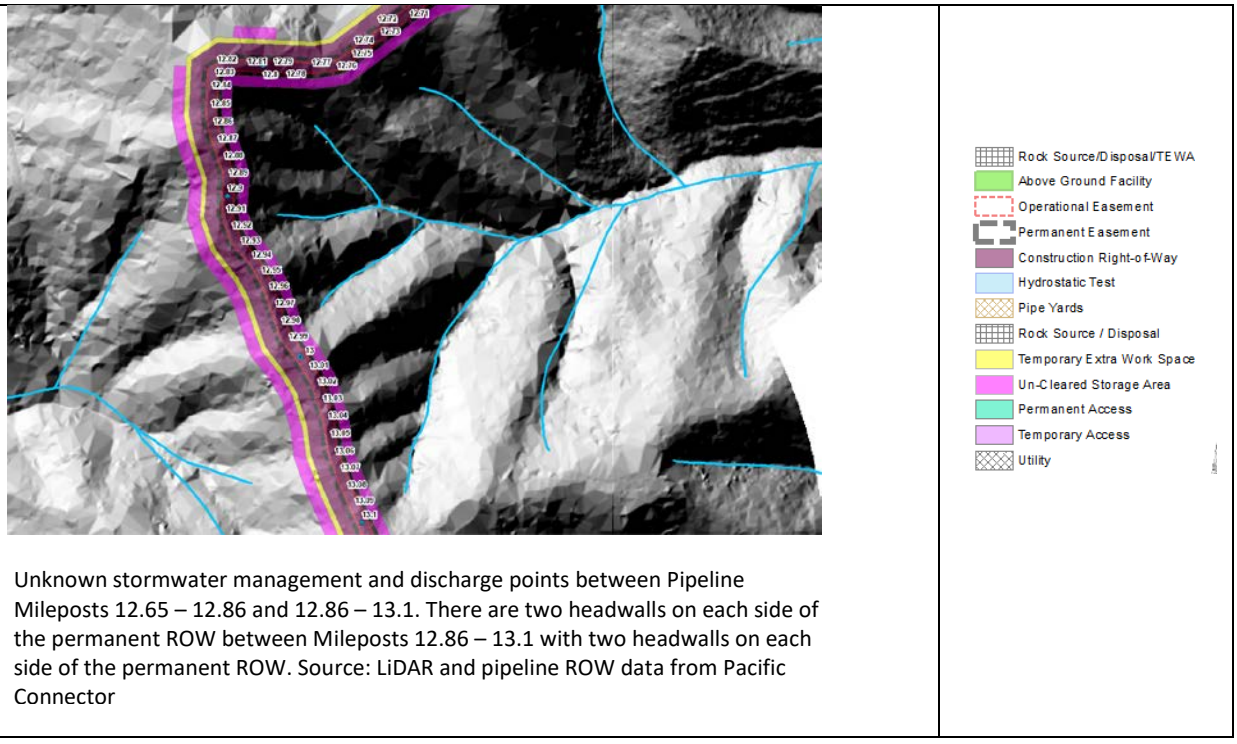
[62] Federal Energy Regulatory Commission. 2013. Upland Erosion Control, Revegetation and Maintenance Plan

discharge it outside the ROW. In the September 7, 2018 information request, DEQ requested JCEP evaluate the post-construction stormwater discharge from the 30-foot permanent ROW during the development of a post-construction stormwater management plan (see page 11 of 15 of Attachment B). For several years following the pipeline's construction, the drainage area for each permanent slope breaker on steep slopes would include 95-feet of the construction ROW width and the 100-feet of ROW to the next permanent slope breaker. This drainage area would decrease to 30 feet by 100 feet once a more mature canopy develops over several decades in the restored construction ROW. As referenced in preceding sections of this Evaluation and Findings Report, concentrating stormwater and discharging it to unstable slopes can produce positive soil pore pressures that initiate landslides.

Stormwater Discharge Relative to Unstable Slopes

To ensure compliance with statewide narrative criteria OAR 340-041-0007(1), DEQ developed the *Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines* (March 2018). In Section E.2.2 of these plan submission guidelines, DEQ requests that project proponents determine if infiltration of stormwater discharge should be avoided due to steep slopes or landslide risks (see Page 9). The proposed permanent ROW traverses over and along unstable slopes in numerous locations. For example, Figure 9 below shows sections of the permanent ROW above headwalls. JCEP has not provided DEQ with a post-construction stormwater plan for the permanent ROW demonstrating how JCEP would manage stormwater along the permanent ROW and, in particular, along landslide susceptibility zones. As discussed in Section 6.1.2.1 of this Evaluation and Findings Report, the stormwater discharge from slope breakers can reduce slope stability.

Figure 9: Construction Right-of-Way Above Headwall



Unknown stormwater management and discharge points between Pipeline Mileposts 12.65 – 12.86 and 12.86 – 13.1. There are two headwalls on each side of the permanent ROW between Mileposts 12.86 – 13.1 with two headwalls on each side of the permanent ROW. Source: LiDAR and pipeline ROW data from Pacific Connector

Stormwater Discharge Near Streams

In its December 20, 2018 supplemental information request, DEQ stressed that the permanent ROW is functioning as a primitive road (see Page 6 and 7 of Attachment A). Additionally, the permanent ROW would have soil compaction from pipe installation and post-construction maintenance, necessitating the need for a stormwater collection system in the form of slope breakers (i.e., water bars). Information from JCEP supports these concerns. For example, on Page 19 of JCEP's Erosion Control and Revegetation Plan (ECRP), JCEP states that it would not mitigate soil compaction over the pipeline's trench line. On page 24 of JCEP's Resource Report 6 (Geologic

Resources), JCEP notes that it would compact the fill over the pipeline after installation. In addition, on page 71 of Resource Report 1, JCEP states that – depending on trench settlement and its damage to slope breakers – sections of the pipeline would require additional fill. The compaction of this additional fill would also lead to soil compaction within the permanent right-of-way during regrading and repair of the permanent slope breakers. These activities as well as those noted below would increase runoff and sediment discharge into the permanent slope breakers.

In its Erosion Control and Revegetation Plan, JCEP references the 2013 FERC Upland Erosion Control, Revegetation and Maintenance Plan. On Page 17 of these guidelines, FERC requires pipeline operators to routinely mow or clear a corridor of 10-feet in width centered on the pipeline. This purpose of this corridor is to maintain this area in an herbaceous state. FERC also requires routine mowing and clearing at least every 3 years to maintain the remaining portion of the 30-foot right-of-way in an herbaceous and small shrub state. A pipeline industry survey indicates that more than 80% of the pipeline operators use mechanical mowing for post-construction ROW maintenance.[63] This mechanical mowing would also contribute to soil compaction. Grass surface roads discharge 50% of the sediment that discharges from a native soil surface road.[64] In fact, the authors of the Washington Road Surface Erosion Model (WARSEM) assign grass surface roads a higher erosion factor for road surfacing than gravel roads with ruts.

Figure 10 shows one of several examples of the permanent ROW crossing or paralleling streams on the 303(d) list for sediment or crossing streams discharging to these sediment-listed streams. Based on its proposed conceptual approach for operating the ROW, the permanent ROW has the potential to discharge sediment at stream crossings. Ongoing increases in sediment loading to a waterbody that is listed on the 303(d) list for sediment in not allowed without either a TMDL allocation, or an implementation plan showing that there will be no increase in loading. OAR 340-41-0004(7)("Water quality limited waters may not be further degraded except in accordance with paragraphs (9)(a)(B), (C) and (D) of this rule."[65]JCEP has not provided the analyses for the discharges that would

[63] Nowak, C., B. Ballard, P. Appelt, and D. Gartman. 2002. *Integrated Vegetation Management of Gas Pipeline Rights-of-Way*. Gas Technology Institute. GRI-01/0096

[64] Swift, L.W. 1984. Gravel and Grass Surfacing Reduces Soil Loass from Mountain Roads. Forestry Science Volume 30 Pages 657-670

[65] (9) Exceptions. The commission or department may grant exceptions to this rule so long as the following procedures are met:

(a) In allowing new or increased discharged loads, the commission or department must make the following findings:

(A) The new or increased discharged load will not cause water quality standards to be violated;

(B) The action is necessary and benefits of the lowered water quality outweigh the environmental costs of the reduced water quality. This evaluation will be conducted in accordance with DEQ's "Antidegradation Policy Implementation Internal Management Directive for NPDES Permits and section 401 water quality certifications," pages 27, and 33-39 (March 2001) incorporated herein by reference; and

(C) The new or increased discharged load will not unacceptably threaten or impair any recognized beneficial uses or adversely affect threatened or endangered species. In making this determination, the commission or department may rely on the presumption that, if the numeric criteria established to protect specific uses are met, the beneficial uses they were designed to protect are protected. In making this determination the commission or department may also evaluate other state and federal agency data that would provide information on potential impacts to beneficial uses for which the numeric criteria have not been set;

(D) The new or increased discharged load may not be granted if the receiving stream is classified as being water quality limited under sub-section (a) of the definition of "Water Quality Limited" in OAR 340-041-0002, unless:

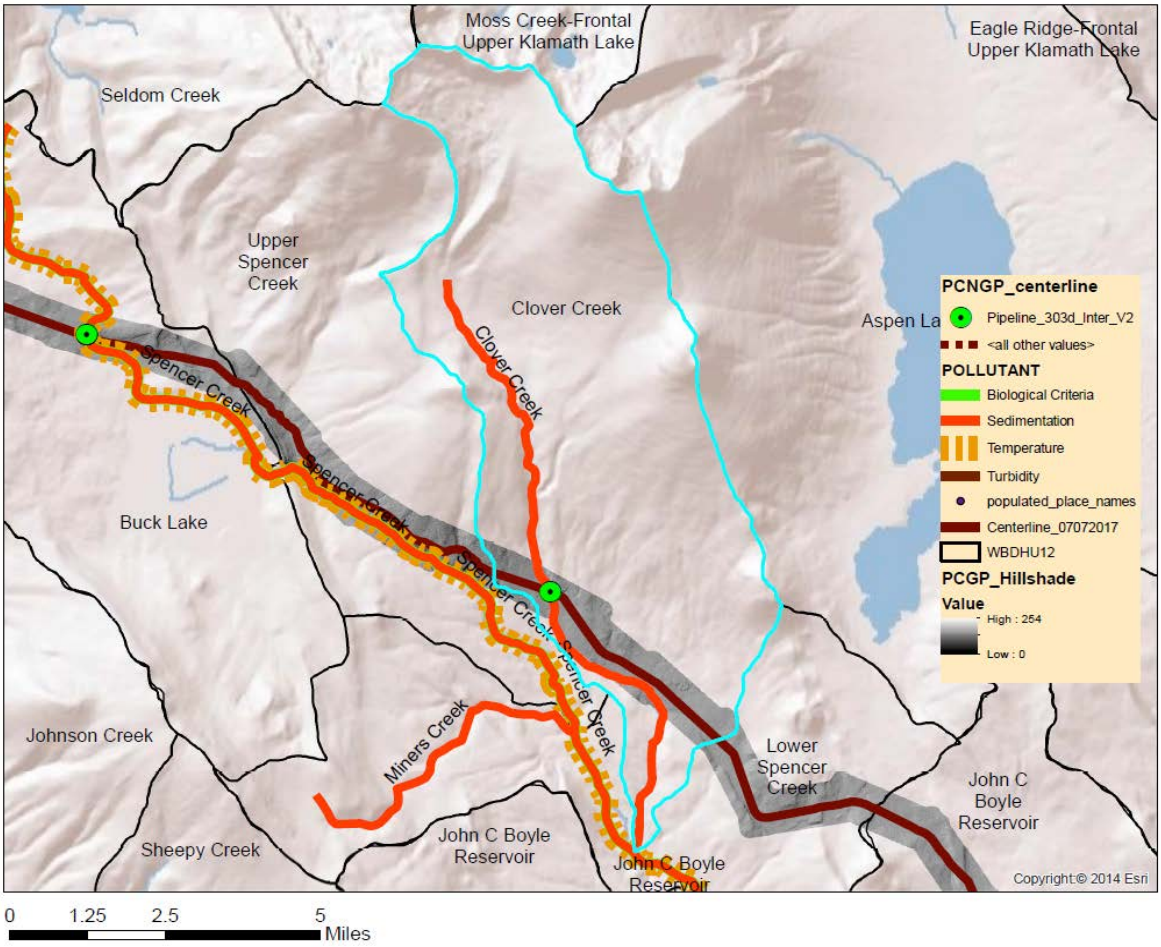
(i) The pollutant parameters associated with the proposed discharge are unrelated either directly or indirectly to the parameter(s) causing the receiving stream to violate water quality standards and being designated water quality limited; or

(ii) Total maximum daily loads (TMDLs), waste load allocations (WLAs) load allocations (LAs), and the reserve capacity have been established for the water quality limited receiving stream, compliance plans under which enforcement action can be taken have been established, and there will be sufficient reserve capacity to assimilate the increased load under the established TMDL at the time of discharge; or

(iii) Effective July 1, 1996, in water bodies designated water-quality limited for dissolved oxygen, when establishing WLAs under a TMDL for water bodies meeting the conditions defined in this rule, the department may at its discretion provide an allowance for WLAs calculated to result in no measurable reduction of dissolved oxygen (DO). For this purpose, "no measurable reduction" is defined as no more than 0.10 mg/L for a single source and no more than 0.20 mg/L for all anthropogenic activities that influence the water quality limited segment. The allowance applies for surface water DO criteria and for Intergravel dissolved oxygen (IGDO) if a determination is made that the conditions are natural. The allowance for WLAs applies only to surface water 30-day and seven-day means; or

occur at each slope breaker for each stream crossing. In addition, JCEP has not performed an analysis to demonstrate that the herbaceous area in the permanent ROW between the last slope breaker and stream is an effective BMP by itself and would not contribute to or cause a water quality standard violation, particularly near waterbodies that are not meeting standards for sediment. As noted in DEQ's September 7 (Page 11 of 15 of, Attachment B) and December 2018 (Page 66 – 68 of Attachment A) information requests, DEQ requested that JCEP evaluate the efficacy of these proposed BMPs using modeling. JCEP has not provided DEQ with this evaluation of the water quality impacts from this slope breaker discharge nor has it provided DEQ with the analysis of the proposed treatment for the discharge from slope breakers immediately upslope of a steam..

Figure 10: Pipeline Parallel to and Crossing Spencer Creek and crossing Clover Creek, near Milepost 177



(iv) Under extraordinary circumstances to solve an existing, immediate and critical environmental problem, the commission or department may, after completing a TMDL but before the water body has achieved compliance with standards, consider a waste load increase for an existing source on a receiving stream designated water quality limited under sub-section (a) of the definition of "Water Quality Limited" in OAR 340-041-0002. This action must be based on the following conditions:

(I) That TMDLs, WLAs and LAs have been set; and

(II) That a compliance plan under which enforcement actions can be taken has been established and is being implemented on schedule; and

(III) That an evaluation of the requested increased load shows that this increment of load will not have an unacceptable temporary or permanent adverse effect on beneficial uses or adversely affect threatened or endangered species; and

(IV) That any waste load increase granted under subparagraph (iv) of this paragraph is temporary and does not extend beyond the TMDL compliance deadline established for the water body. If this action will result in a permanent load increase, the action must comply with sub-paragraphs (i) or (ii) of this paragraph.

On page 63 to 68 (Attachment A) of the December 20, 2018 supplemental information request, DEQ provided JCEP with the basis for DEQ's request for the analyses described in Section E.3, E.6, and E.7 of DEQ's submission guidelines for post-construction stormwater management plans. On Page 78 to 80 of Attachment A in its December 20, 2018, supplemental information request, DEQ provided JCEP with an example of a landslide prone slope combined with erosive soils and stormwater to create soil slumping on a power line right-of-way intersecting JCEP's proposed pipeline right-of-way. These examples illustrate the site-specific challenges and need for effective BMPs to control sediment at stream crossings along the permanent right-of-way.

Based upon its evaluation, DEQ is unable to conclude that JCEP's proposed permanent pipeline right-of-way exhibits the highest and best controls, and demonstrates that proposed BMPs would minimize the erosion of and discharge of inorganic and organic debris, turbid flows, and sediment from cut banks, fills, and road surfaces. OAR 340-041-0007.

6.1.2.5 Terminal and Off-Site Project Area Stormwater

JCEP proposes to build and operate a LNG Export Terminal that would generate stormwater. JCEP proposes to use an oily waste collection system to collect and transport stormwater from drainage areas with various containment systems for tanks and bulk storage containers holding gas, diesel, and process chemicals such as amine and other chemicals yet to be identified. This oily waste system conveys stormwater to an oil/water separator that in turn discharges to an existing industrial wastewater pipeline that discharges to the Pacific Ocean. In its September 25, 2018 information request, DEQ requested JCEP identify the significant material transported within, stored, and used at the Terminal. JCEP has not identified the type of amine it would use or other process chemicals at the Terminal. This information is necessary to evaluate the water quality impacts of JCEP's proposed activities.

Additionally, the construction of the Terminal necessitates the excavation of uplands to create the Marine Slip for the Terminal and dredging to create the Access Channel and Material Offloading Facility. JCEP would use this excavated soil and dredged material as fill in the Terminal's Ingram Yard and South Dunes areas as well as in several Off-Site Project Areas such as the Roseburg Forest Products Property.[66] The leachate from dredged estuarine deposits would potentially drain to sensitive receptors such the freshwater wetlands.[67] To address during construction and post-construction stormwater discharges from the Terminal and the Off-Site Project Areas, JCEP proposed the November 2017 Storm Water Management Plan. For managing discharges transporting dredge material and the leachate from dredged material disposal, JCEP proposes to use specified Potential Dredge Disposal Locations featured in Enclosures 19 – 22 of Part 1, Appendix N-5. DEQ reviewed these documents and, based on this review, issued the information requests noted below.

In its review of the Terminal Stormwater Management Plan, DEQ used the March 2018 Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines. DEQ developed these guidelines to ensure project proponents used the highest and best practicable treatment control as required in Statewide Narrative Criteria OAR 340-041-0007(1). In its September 25, 2018 information request, DEQ provided JCEP with comments describing how the stormwater management plan did not address these guidelines. DEQ also requested that JCEP seek a National Pollutant Discharge Elimination System 1200-C Permit Application for the Terminal and the Off-Site Project Areas noted in its plan.

In an October 25, 2018 response to this information request, JCEP informed DEQ that it would address DEQ's comments in the first quarter of 2019. On April 1, 2019, DEQ received a revised plan entitled LNG Terminal Stormwater Management Plan. JCEP revisions partially addressed DEQ's information request. However, as noted below, JCEP has not yet demonstrated it would manage stormwater discharge with the highest and best practicable

[66] Drawing 21, Potential Dredge Disposal Locations Plan View. Section 401 Water Quality Submittal, U.S. Army Corps of Engineers Joint Permit Application. Jordan Cove Energy Project.

[67] Page 17, Table 4-1. Wetland and Estuarine Resources, LNG Terminal Stormwater Management Plan. March 2019

treatment controls, manage construction access road building and maintenance to reduce erosion, and prevent the deposit of organic and inorganic deposits deleterious to aquatic life. Moreover, JCEP has not yet demonstrated that the construction stormwater discharges would comply with applicable turbidity and biocriteria standards.

To manage construction stormwater, JCEP has not provided DEQ with a NPDES 1200-C General Permit Application(s) for construction stormwater in the Terminal, Off-Site Project Area as well as construction access roads proposed for these construction sites. The 1200-C permit application requires JCEP to submit an Erosion and Sediment Control Plan with the application. This ESCP must contain among other requirements areas of soil disturbance, drainage patterns, discharge points, sensitive receptors such as wetlands, and sediment and erosion controls including installation techniques (see Page 13 – 14 of 30, Schedule A.12, NPDES 1200-C Permit). DEQ does not have an ESCP to determine if the management of construction stormwater at these sites would violate OAR 340-041-0007(1), (7), and (11) as well as Schedule A.10 of the 1200-C permit. Schedule A.10 on In-stream Water Quality Standards states that compliance with this permit would result in stormwater discharges being controlled as necessary to meet water quality standards in the absence of information demonstrating otherwise. Without the information in the ESCP, DEQ cannot determine if the construction stormwater discharge would comply with the turbidity standard. Moreover, DEQ cannot reasonably determine that construction stormwater discharge would sufficiently protect aquatic life in wetlands and in Coos Bay.

For the revised LNG Storm Water Management Plan, DEQ's review noted significant progress in addressing DEQ's 401 plan submission guidelines. However, among the deficiencies in this revised plan, DEQ identified two proposed categories of action that do not demonstrate JCEP would meet OAR 340-041-0007(1) given the information provided in this plan. JCEP has provided incomplete information for spill containment within the Terminal. JCEP has not provided DEQ the design information for stormwater controls in the Terminal's abandoned Construction Facility Areas in the Terminal. These two deficiencies are detailed below.

In Section 5.5.2.1 of the JCEP's revised plan, JCEP proposes three categories of spill containment. In each category, JCEP provides qualitative information on proposed controls. In addition, in its April 1, 2019 response to DEQ's September 25, 2018 information request, JCEP directed DEQ to its proposed Spill Prevention, Control, and Countermeasure Plan for spill containment controls for the Terminal Stormwater Management Plan.[68] The cover of JCEP's SPCC Plan contains a note that this plan is a preliminary version. DEQ reviewed this plan and determined that it is not a complete or final plan. For example, in Table 1-1 of the SPCC Plan, the list of bulk storage containers and their secondary containment system is incomplete. JCEP does not provide information on the secondary containment for transformers. JCEP also notes that other oil storage systems and their containment controls are to be determined in the future. Additionally, Section 8 of this plan is preliminary information and JCEP notes that it would update this plan to reflect as-built controls.

In the final SPCC Plan, DEQ is seeking information on where exactly JCEP would locate on its stormwater site plan the proposed loading aprons, lined earthen berms, double walled tanks, and other containment structures designed to contain spills as well as information on the specific design features of these controls. For reasonable assurance, DEQ needs to know if JCEP would size the containment berms coupled with the containment capacity of the oil/water to capture the largest anticipated spill. Statements in the current draft SPCC Plan that JCEP would comply with federal regulations are not a demonstration that JCEP's proposed control concepts have the capacity to prevent a discharge to surface water. Site-specific information on proposed structural spill controls is essential for DEQ to evaluate their potential to control discharges to surface water. JCEP's containment controls must demonstrate consistency with the statewide narrative criteria for highest and best practicable controls to prevent the release of toxic substances to the Pacific Ocean. Site-specific design information is missing in the SPCC Plan and the revised Terminal Stormwater Management Plan.

For the abandoned Construction Facility Areas at the Terminal, JCEP did not provide DEQ with the drainage area

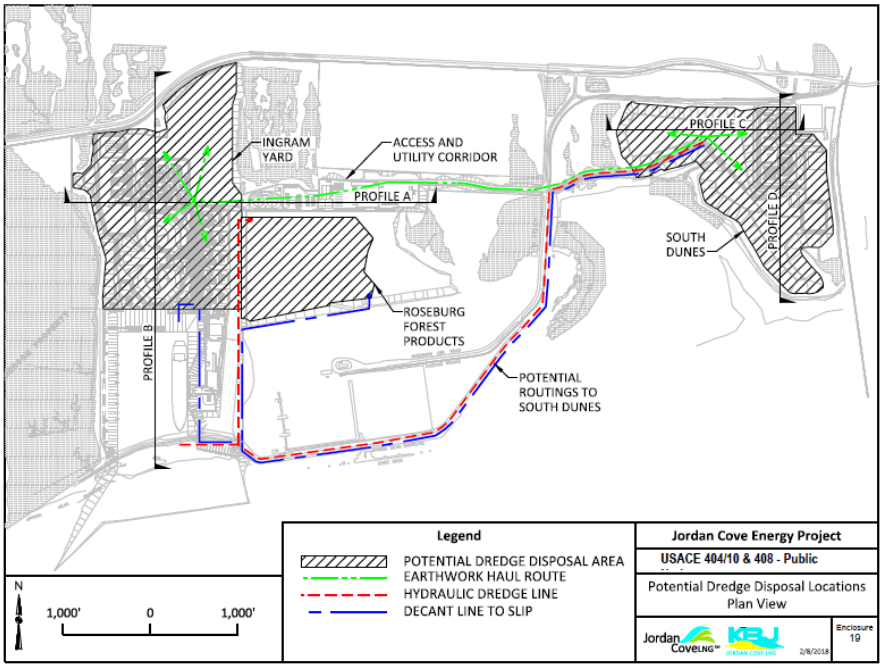
[68] Spill Prevention, Control, and Countermeasure Plan – Operation. August 29, 2017. Part 1: Appendix K, Section 401 Water Quality Package

for each infiltration control for these areas. JCEP did not provide the designs for each infiltration control that DEQ requests in Section E.7 of its 401 plan submission guidelines. Construction designs and specifications that DEQ requests in Section E.8 of these guidelines are necessary to demonstrate JCEP would prevent sediment inundation and erosion in all control prior to their operation (i.e., commissioning). Moreover, JCEP needs to provide design information to demonstrate that the infiltration controls can contain the volume of stormwater they receive without altering the hydrology of adjacent groundwater fed wetlands. Inundating these wetlands with surface water would convert them into stormwater detention ponds thus altering their resident aquatic biological communities by altering their values and functions. At present, JCEP's submittal does not demonstrate that the stormwater infiltration controls in the Construction Facility Areas provide the highest and best practicable controls of flows to meet OAR 340-041-0007(1).

For managing discharges transporting dredge material and the leachate from dredged material disposal, DEQ identified deficiencies in JCEP's proposed documents for managing dredging operations and dredge material to prevent discharges to wetlands and Coos Bay. Specifically, in its December 20, 2018 supplemental information request (see Pages 85 - 87, Attachment A), DEQ informed JCEP did not demonstrate in its submittal that the highest and best treatment controls were proposed to meet statewide narrative criteria OAR 340-041-0007(1) and (11). For example, DEQ noted that JCEP did not provide details on how JCEP would manage leachate from discharging to surround freshwater or estuarine wetlands altering their chemical composition and turbidity. Increasing turbidity in and inundating freshwater wetlands with saline leachate would alter their capacity to support the aquatic biological communities dependent on these wetlands.

In its October 8, 2018 response to DEQ's September 7, 2018 information request, JCEP referred DEQ to Potential Dredge Disposal Locations featured in Enclosures 19 – 22 of Part 1, Appendix N-5 of the 401 Water Quality Package. DEQ presents Enclosure 19 below to highlight the lack of detailed practices to manage the wetlands – shaded gray – adjacent to proposed dredging disposal areas:

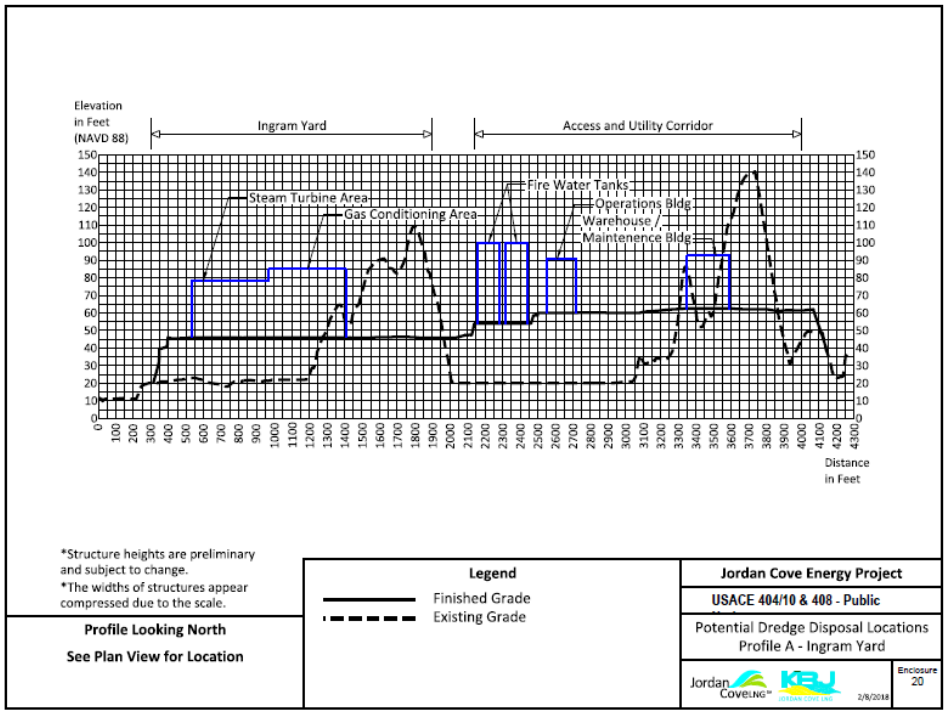
Figure 11: Potential Dredge Disposal Areas Relative to LNG Terminal and Adjacent Wetlands



Enclosure 19 does not show structural controls to demonstrate saline leachate or decant from dredged material would not discharge to adjacent freshwater wetlands. JCEP has not indicated how it would place containment

structures around the dredged material nor change the grade to direct decant to the dredge line, size a collection basin to capture the decant, operate a pump to transfer the decant to a discharge location, or propose a discharge location. Enclosures 20 – 22 only provide the elevation of dredge material as shown in Figure 12.

Figure 12: Proposed Finish Grade of Dredge Soil Locations



For upland confined dredge disposal facilities, the State of New Jersey requires project proponent to consider five factors in the placement of dredged material. These factors are illustrative on what DEQ would consider in evaluating a proposal with the required information. These factors are:

- Location of facility and site-specific condition including compatibility with adjacent and nearby land use.
- Characterization of the dredged material proposed for placement at the facility.
- Design and construction of the facility.
- Operation of the facility.
- Final closure of the facility.[69]

At present, JCEP's submittal does not demonstrate that controls for the disposal of dredged material provide the highest and best practicable controls of flows to meet OAR 340-041-0007(1) and prevent the deposit sediment deleterious to aquatic life to meet OAR 340-041-0007(11). Given this, DEQ cannot conclude that the JCEP's proposed disposal of dredge material would be conducted in a manner that would comply with the turbidity standard and biocriteria standard.

6.1.2.6 Dredging

JCEP's dredging in the North Spit of Coos Bay would reduce water quality by increasing turbidity above the numeric limits established in Oregon's Turbidity water quality standard.[70] JCEP provides an overview of dredging

[69] State of New Jersey. October 1997. Dredging Technical Manual, "The Management and Regulation of Dredging Activities and Dredge Material Disposal in New Jersey's Tidal Waters." Pages 73

[70] [70] Hydrodynamic Studies – Turbidity Analysis, Moffat and Nichol, November 2017.

procedures in the Dredge Material Management Plan and preferred locations for dredge material disposal but does not address procedures to minimize adverse effects of these actions on water quality. In particular, the plan does not specify methods to manage dredge spoil disposal in a manner that protects water quality. In one example, the plan recommends hydraulically transferring dredged material to the APCO sites and discharge of the slurry material to temporary containment berms. Hydraulic transfer requires large volumes of water to maintain dredge material in suspension during transfer. JCEP's Dredge Material Management Plan includes no proposal to manage and treat discharge from these containment areas to remove suspended material and reduce turbidity.

On September 7 and December 20, 2018, DEQ requested JCEP provide additional information, including a Dredging Pollution Prevention Plan, to describe specific dredging methods and procedures. In particular, DEQ requested the following information from JCEP to describe measures to reduce project effects on water quality:

- The type of pollution controls JCEP would use including its design and specifications.
- The specific applications for these controls.
- The specific location where JCEP would employ these controls relative to sensitive sites as well as other landscape features (e.g., drainage pattern, vegetation, etc.).
- The maintenance schedule for each control.
- A monitoring plan for evaluating the efficacy of all proposed controls and compliance with the turbidity standard.[71]

Oregon's Statewide Narrative Criteria requires applicants to demonstrate the activity includes the highest and best treatment controls and measures to prevent the discharge of organic and inorganic material into waterways. Absent a plan demonstrating JCEP has addressed these requirements, DEQ cannot confirm that JCEP has selected the highest and best treatment options to minimize anticipated project-effects in compliance with Oregon's Statewide Narrative Criteria.

6.1.3 DEQ Findings

Based on the preceding evaluation of Project effects, DEQ adopts the following findings related to OAR 340-041-0007 (Statewide Narrative Criteria):

1. JCEP has not demonstrated that the proposed pipeline construction, access road construction and maintenance, and pipeline right-of-way activities would employ the highest and best treatment to control pollution, as required by OAR 340-041-0007(1);
2. JCEP has not demonstrated that the proposed road construction and maintenance activities would be conducted in a manner to keep waste materials from cut banks, fills, and road surfaces out of public waters, as required by OAR 340-041-0007(7);
3. JCEP has not demonstrated that the proposed pipeline construction, access road construction and maintenance, and pipeline right-of-way activities would employ state-of-practice methods to identify landslide susceptibility zones and mitigate landslide risks to control discharge of organic or inorganic debris, as required by OAR 340-041-0007(11);
4. JCEP's failure to provide requested specific waterbody crossing and restoration plans, or plans that include descriptions of methods to construct and maintain roads in a manner to keep waste materials out of public waters and descriptions of methods to control discharge of organic or inorganic debris, prevented the department from being able to process the application within the time allowed by law. OAR 340-048-0020(3);and,
5. JCEP has not demonstrated that the proposed LNG Export Terminal and associated facilities will comply with Oregon's statewide narrative criteria. DEQ makes this finding because:
    a. JCEP did not provide details for spill containment for Terminal.
    b. JCEP did not provide details for infiltration controls for Construction Facility Areas.

[71] Supplemental Information Request. DEQ, December 20, 2018.

c. JCEP did not provide details for dredged material disposal controls.
d. JCEP did not demonstrate that proposed construction stormwater controls are the highest and best treatment options to control pollution as required by OAR 340-041-0007(1).
e. JCEP's proposed dredging activities do not employ the highest and best treatment options for preventing or minimizing turbidity as required by OAR 340-041-0007(1); and,
f. JCEP's proposed dredging activities do not employ sufficient methods to keep organic or inorganic material out of public waters as required by OAR 340-041-0007(11).

Based upon these findings, violations of the statewide narrative criteria are likely to occur and DEQ concludes that it does not have a reasonable assurance that the proposed activities will be conducted in a manner that will not violate the Statewide Narrative Criteria.

6.2 Biocriteria

6.2.1 Applicable Standard

Oregon Administrative Rules 340-041-0011:

Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.

DEQ's Biocriteria narrative water quality standard is intended to avoid detrimental changes to biological communities caused by pollution. EPA guidance recommends using biological community assessments as an indicator for measuring support for aquatic life.[72] DEQ has developed procedures to characterize the existing condition of benthic communities as a means to assess whether detrimental changes affecting water quality are likely to occur.[73] DEQ's methods use information from reference sites throughout Oregon to assess existing and future conditions of biological communities resulting from anthropogenic activities.

This narrative criterion recognizes that compliance with individual criteria may not fully capture synergistic effects resulting from multiple stressors and cumulative impacts on aquatic species and resident biological communities. The biocriteria standard complements parameter-specific standards by extending broad protections to all designated beneficial uses with the implicit assumption that if the most sensitive beneficial use is protected, then all uses would be protected. Application of the biological criteria standard is intended to assess the overall impact to the aquatic community from water quality changes attributable to an anthropogenic activity.

Definitions applicable to the biocriteria standard include (OAR 340-041-0002):

(5) "Appropriate Reference Site or Region" means a site on the same waterbody, or within the same basin or ecoregion that has similar habitat conditions, and represents the water quality and biological community attainable within the areas of concern.

(6) "Aquatic Species" means plants or animals that live at least part of their life cycle in waters of the state.

(17) "Designated Beneficial Use" means the purpose or benefit to be derived from a water body, as designated by the Water Resources Department or the Water Resources Commission.

[72] US EPA, July 29, 205, Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, page 41.
[73] Methodology for Oregon's 2018 Water Quality Report and List of Water Quality Limited Waters, November 2018. Oregon Department of Environmental Quality: https://www.oregon.gov/deq/FilterDocs/ir2018assessMethod.pdf.

(19) "Ecological Integrity" means the summation of chemical, physical and biological integrity capable of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat of the region.
(50) "Resident Biological Community" means aquatic life expected to exist in a particular habitat when water quality standards for a specific ecoregion, basin, or water body are met. This must be established by accepted biomonitoring techniques.

(75) "Without Detrimental Changes in the Resident Biological Community" means no loss of ecological integrity when compared to natural conditions at an appropriate reference site or region.

6.2.2 Evaluation of Biocriteria

6.2.2.1 Pipeline construction

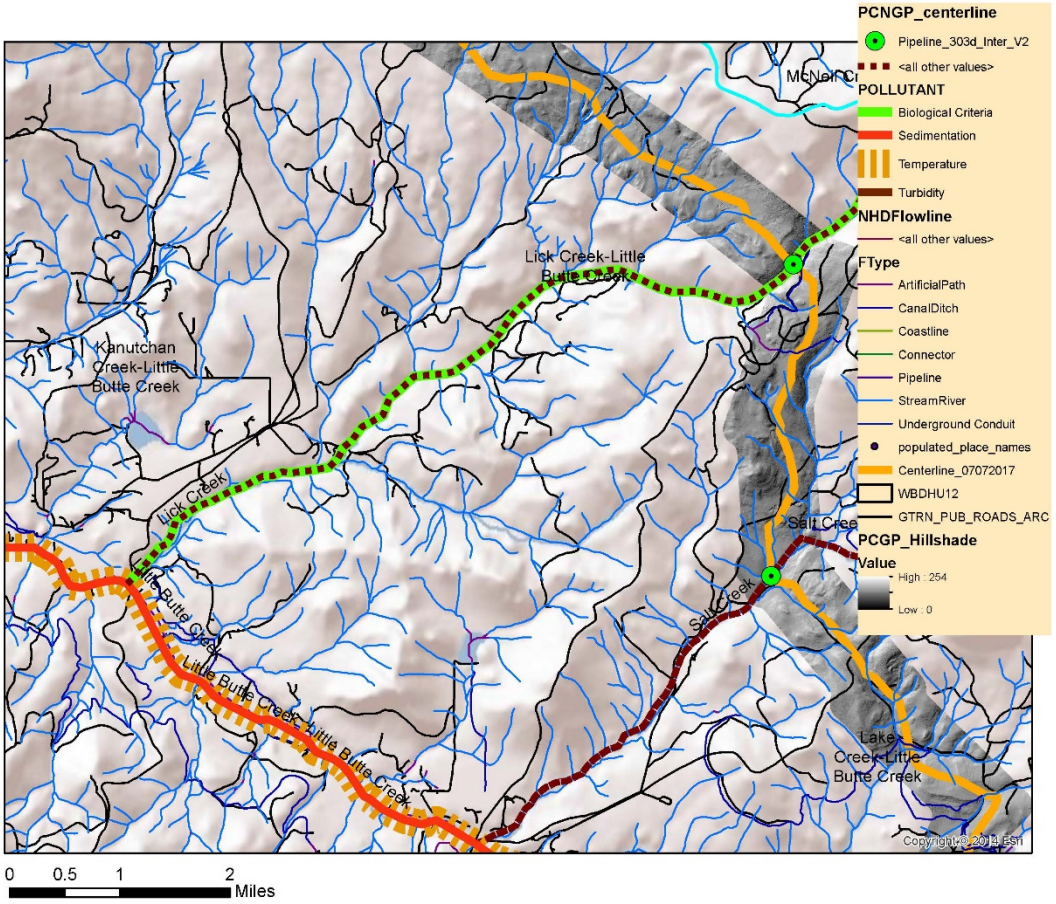
Section 6.1.2.1 of this report provides an evaluation of pipeline construction effects in areas of known or suspected landslide occurrence. In particular, portions of the Tyee Core Area in the Oregon Coast Range are characterized by historical land movement including rapidly moving landslides. Many of these areas form the upper drainages of headwater streams. Debris flows triggered by the placement of material and/or the management of stormwater can result increase landslide frequency that causes sediment discharge to receiving waters. Discharge of sediment and turbid flows to headwater (i.e., zero order) streams would commonly and adversely impact habitat and beneficial uses protected by the biocriteria standard. Information provided by JCEP does not demonstrate that pipeline construction would sufficiently avoid these impacts to provide reasonable assurance that the activities would not violate this standard by resulting in a loss of ecological integrity when compared to natural conditions.

DEQ refers the reader to Section 6.1.2.1 of this Report for DEQ's evaluation of JCEP's proposal to develop a construction right-of-way and a construction access road to install approximately 229 miles of pipeline. The evaluation in Section 6.1.2.1 is also relevant to DEQ's evaluation of JCEP's compliance with Oregon's biocriteria while developing the construction right-of-way (ROW) and the construction access road to build the pipeline. DEQ briefly summarizes this evaluation below.

In Section 6.1.2.1, DEQ summarizes JCEP's proposal to grade an access road and construct a 229-mile line pipeline. DEQ describes how this action would likely result in both the temporary and ongoing discharge of sediment without adequate BMPs.

Figure 13 shows the JCEP Gas Pipeline crossing tributaries to Lick Creek and crossing Lick Creek near Milepost 140.27. Lick Creek is listed on the 303(d) List for biocriteria. Sediment discharge from pipeline construction and debris flows from landslides initiated by the construction of the right-of-way could affect aquatic life in Lick Creek and the attainment of the biocriteria standard in this impaired waterbody. As noted earlier in this report, for a 303(d) listed waterbody, without a TMDL, no ongoing detrimental impact is authorized. Although natural landslides are an integral part of stream form and function, human-caused debris torrents and sedimentation impact water quality by changing the natural cycles of sediment delivery to systems, which impacts the aquatic environment; thus, affecting aquatic life (Castro and Reckendorf 1995).

Figure 13: Lick Creek and Little Butte Creek Vicinity



JCEP has not demonstrated that methods employed in pipeline construction, the development of the construction ROW, and the use of the construction access roads would sufficiently protect State waters to avoid detrimental changes in resident biological communities to comply with Oregon's biocriteria standard. The following information would be needed in order for DEQ to have a reasonable assurance that the biocriteria standard will be met:

- Modeling demonstrating that proposed right-of-way erosion controls are the most effective.
- A landslide hazard assessment following state-of-practice protocols, including both construction-induced risks and post-construction risks.
- Designs for stormwater management above unstable slopes in the right-of-way.
- Designs for fill, trenching spoils, and/or grading spoils placed on unstable slopes.

JCEP's identified siting, design and construction methods provide an inadequate analysis of Project hazards and inadequate measures to reduce potential impacts to streams and the aquatic life dependent upon these streams. DEQ cannot conclude from JCEP's proposed methods and available information that construction of the pipeline will comply with the biocriteria standard.

6.2.2.2 Waterbody Crossings

The JCEP gas pipeline would cross approximately 252 waterbodies, and in most cases, use dry open-cut crossing

techniques.[74] Dry open-cut crossings rely on diverting water around the work area to allow trenching and pipe placement to proceed across the temporarily dewatered stream. JCEP expects to backfill and restore the trench site according to the FERC's Wetland and Waterbody Procedures for most dry open-cut crossings. FERC's procedures call for one foot of clean gravel or native cobbles in all streams that contain coldwater fisheries. JCEP, however, has proposed to modify the approach where the existing substrate is not gravel or cobbles and site access is limited.[75] In these cases, JCEP would attempt to match the natural streambed material size, gradation, and composition as closely as possible.

Potential Effects on Biocriteria

Waterbody crossings can cause short- and long-term alterations of stream habitat and hydrology. The biocriteria standard extends protections to waterbodies to provide full support for beneficial uses affected by project-related actions. These actions include dry open-cut trenching, backfill placement, and restoration actions as discussed further below.

JCEP proposes a minimum of five-feet of cover above pipeline segments beneath stream crossings. The resulting trenches would temporarily displace native soils that can alter in-situ characteristics including intrinsic permeability. Zones of higher permeability can cause local infiltration, partial stream capture, and create a fish passage barrier. Project-related actions that reduce streamflow may limit habitat availability, alter channel hydrology, and modify hyporheic exchange in riparian areas.

In addition, trenches installed in consolidated rock may require blasting, rock-sawing, or jackhammering to achieve excavation specifications. Open cut trenches in bedrock-dominated stream channels are susceptible to upstream propagation of knickpoints created by fractures and joints in the stream's bedrock created during the excavation process.[76] Knickpoint propagation in bedrock-dominated streams can alter stream geomorphology and potentially develop into barriers to fish migration.

Last, general construction practices related to flume installation and removal, site-restoration, and other Project-related activities can increase stream sediment releases. Sediment releases can have an adverse effect on substrate characteristics, oxygen availability, and habitat complexity.

Evaluation

Project-related activities including trenched waterbody crossings may affect stream habitat and reduce support for beneficial uses. JCEP must identify appropriate mitigation or restoration procedures that address the specific negative impacts to the biological communities present at each waterbody crossing to demonstrate compliance with this standard. While the biocriteria standard extends protections to all waterbodies, DEQ has identified that the pipeline would cross five stream segments listed as impaired for the biocriteria water quality standard. Two of these crossings, Olalla Creek (MP 58.78) and North Myrtle Creek (MP 79.12), include spawning and rearing habitat for Endangered Species Act-listed Oregon Coast ESU Coho salmon. JCEP has classified these crossings as Level 2 with a high potential for migration, avulsion and/or scour. In addition, JCEP proposes numerous waterbody crossings for headwater streams that are hydrologically connected with upper-watershed habitat networks. Maintaining protections at each affected waterbody crossing is critical to protecting state waters and designated beneficial uses to comply with the biocriteria water quality standard.

DEQ requested information on March 11, 2019, including specific field data to characterize the pre-development hydrology, geomorphic characteristics, and habitat features. DEQ based this request on protocol developed by the U.S. Fish and Wildlife Service in conjunction with Ruby Pipeline, LLC for assessing risks from pipeline stream

[74] Pacific Connector Gas Pipeline Resource Report RR2, Appendix 2/Table A.2-2.

[75] Pacific Connector Gas Pipeline, Erosion Control and Revegetation Plan. October 2017.

[76] Selander, Jacob. 2004. Processes of Knickpoint Propagation and Bedrock Incision in the Oregon Coast Range. Department of Geologic Sciences. University of Oregon.

crossings.[77] The site assessments DEQ requested for planning construction and restoration actions are necessary for DEQ to evaluate compliance with the biocriteria standard. Without this information DEQ is unable to find that the proposed waterbody crossing methods will comply with OAR 340-041-0011.

6.2.2.3 Road Construction and Maintenance

For pipeline construction, JCEP would need to improve and maintain several hundred miles of existing access roads. JCEP would also need to develop a 229-mile construction access road in the construction right-of-way. Moreover, JCEP would need to construction 25 segments of Temporary Access Roads and Permanent Access Roads. The improvement of existing access roads would involve resurfacing, widening of the travel way, culvert replacements, installation of temporary bridges, and other actions necessary to provide transportation access during construction. As documented in Section 6.1.2.3 of this report, road surfaces, fills, and cut slopes serve as a potential source of sediment input to streams. Sedimentation from road can significantly affect habitat function and availability.

DEQ refers the reader to Section 6.1.2.3 of this Report for DEQ's evaluation of JCEP's proposed road use and construction during pipeline construction. The evaluation in Section 6.1.2.3 is relevant to DEQ's evaluation of JCEP's compliance with the biocriteria standard while using existing access roads, improving existing roads, and constructing new roads. DEQ briefly summarizes this evaluation below.

In Section 6.1.2.3, DEQ describes how JCEP's use of existing access roads can cause sediment discharge to streams. DEQ also describes the lack of clear BMPs that JCEP would use to maintain and, if needed, improve these roads to prevent sediment discharge to streams during pipeline construction. In addition, DEQ evaluates the Erosion Control and Revegetation Plan and Transportation Management Plan that JCEP proposed to control sediment discharge from roads. The evaluation of these plans documents their deficiencies. Finally, DEQ evaluates JCEP's actions to conduct an inventory of unpaved existing access roads to develop a DEQ-requested maintenance and improvement for these roads. DEQ documents the incomplete inventory that JCEP conducted to identify hydrologically connected existing access road segments. This incomplete inventory provides a gross underestimate of the access road segments that have the potential to discharge sediment to streams.

In its December 20, 2018 supplemental information request, DEQ summarized the scientific literature and technical resources concerning the importance of nonpaved road design to protect water quality for aquatic life (see Page 18 - 19 of Attachment A). Notably, the National Marine Fisheries Service identified routine road maintenance as a needed action to assist in the recovery of salmonids listed under the Endangered Species Act (see Page 18 of Attachment A). Castro and Reckendorf (1995) summarize the impact of sediment in aquatic environments and its effect on aquatic life.

JCEP has not demonstrated that methods employed in pipeline construction and the design of the construction access road would avoid detrimental changes to resident biological communities as required by Oregon's biocriteria standard. Specifically, the application lacks the following information necessary to evaluate project effects on the biocriteria standard:

- Comprehensive inventory of hydrologically connected existing access road segments.
- Comprehensive maintenance and improvement plan for existing access roads.
- Information supporting proposed erosion controls on unstable cut and fill slopes on improved/new roads.
- Modeling demonstrating that the proposed erosion controls on roads are the most effective.
- A landslide hazard assessment including post-construction landslide hazards.

[77] Castro, J.M., A. MacDonald, E. Lynch, and R. Thorne. 2014 *Risk-based Approach to Designing and Reviewing Pipeline Stream Crossings to Minimize Impacts to Aquatic Habitats and Species*. River Research and Applications

Without this information, DEQ is unable to find that the proposed road construction and maintenance activities will comply with OAR 340-041-0011.

6.2.2.4 Pipeline Right-of-Way

JCEP proposes to manage the pipeline permanent easement in such a way to provide access and maintenance in perpetuity. Pipeline corridor management includes maintaining stormwater controls along the alignment. Sediment runoff is a potential source of pollutants to receiving streams. Proper runoff controls and management practices are necessary to avoid discharges that reduce support for aquatic receptors.

DEQ refers the reader to Section 6.1.2.4 of this report for DEQ's evaluation of the potential effects of JCEP's permanent pipeline right-of-way. DEQ's analysis in Section 6.1.2.4 is relevant to the potential effects of stormwater discharge and the management of cut and fill slope on the biocriteria standard. DEQ briefly summarizes this evaluation below.

In Section 6.1.2.4, DEQ evaluates the function of a permanent slope breaker (i.e., water bar) and describes how this stormwater collection system concentrates stormwater discharge along the permanent ROW. DEQ details the initial and final drainage area for permanent slope breakers on steep slopes. In addition, DEQ notes the potential for JCEP to discharge post-construction stormwater from the permanent ROW to landslide susceptibility zones. DEQ points out that JCEP did not provide DEQ with a post-construction stormwater management plan following DEQ's 2018 guidelines for post-construction stormwater plan submissions which request project proponents consider steep and landslide risks when siting discharge points.

In the evaluation in Section 6.1.2, DEQ evaluates the permanent slope breakers closest to pipeline stream crossings and their potential to discharge sediment and other pollutants to streams. DEQ explains how the permanent ROW is functioning as primitive road due soil compaction in the ROW during pipeline construction and during post-construction maintenance. DEQ finds that the permanent ROW may discharge sediment streams at a rate equivalent to a gravel road with ruts. Additionally, DEQ's finds that discharges from slope breakers within 200 feet of streams would likely deliver sediment to these streams. Moreover, DEQ notes that the area between the stream and permanent slope breaker upslope from the stream is a source of sediment delivery to streams. Given these sources of discharge, DEQ is unable to find that the proposed permanent operation and maintenance of the pipeline right-of-way will comply with OAR 340-041-0011.determine that the proposed activities will

In its December 20, 2018 supplemental information request (see Pages 66 - 68 of Attachment A), DEQ's explained its rationale for its request for modeling and engineering analysis for the permanent ROW stormwater discharges to stream described above. This evaluation further documents the potential sources of sediment discharge that can contribute to or cause a violation of Oregon's biocriteria standard.

6.2.2.5 Terminal and Off-Site Project Area Stormwater

Section 6.1.2.5 of this report provides an evaluation of Jordan Cove's proposed actions to manage stormwater in the construction and operation of the Terminal and Off-site Areas. DEQ refers the reader to Section 6.1.2.5 for DEQ's evaluation of these proposed actions. The evaluation in Section 6.1.2.5 is also relevant to DEQ's evaluation of Pacific Connector's compliance with Oregon's biocriteria while managing construction stormwater in the Terminal and Off-Site Project areas, managing stormwater and decant from dredge material disposal sites, and managing post-construction stormwater during the operation of the Terminal. DEQ notes particularly that the proposed stormwater discharge is via an existing ocean outfall. DEQ has not evaluated the effects of this aspect of the proposed activity on biological receptors in the vicinity of the outfall.

6.2.2.6 Dredge Material Management

JCEP proposes to dredge and excavate 6.32 million cubic yards to create the project's slip and access channel, as well as marine waterway modifications. JCEP proposes to dispose of this material at the LNG facility, the APCO sites, and at the Kentuck mitigation site. JCEP anticipates disposing much of the material at the Jordan Cove facility to increase the site elevation to a minimum of 34.5 feet NAVD88 consistent with design-level tsunami mitigation criteria.[78,79] Several upland wetland areas are known to exist in the immediate vicinity of developed portions of the LNG site. These are identified as Wetlands 2013-2, 2013-3, and 2013-4 on Figure 14 and include seasonally flooded Palustrine emergent wetlands whose hydrology is influenced by seasonally high groundwater conditions.

JCEP proposes to avoid site development that directly affects the wetland areas referenced above. However, placement of dredge material near these locations can permanently alter surface hydrology necessary to maintain hydrologic function of the wetland habitat. Further, runoff from marine dredged material may alter salinity and water quality characteristics of these areas. Hydrologic and chemical alteration of wetland habitats may reduce support for biological communities adapted to freshwater, seasonally flooded wetland environments. Oregon's biocriteria requires that water quality be preserved to provide support for aquatic species without detrimental changes in the resident biological communities. On December 20, 2018, DEQ requested JCEP provide information to demonstrate what measures JCEP would undertake to demonstrate protection of water quality given the proposed potential disposal of such materials in proximity to wetlands. Specifically, DEQ requested:

- How would JCEP manage the fresh and/or saline decant water if discharged from these sites to the surrounding landscape?
- How would the management of the decant water comply with Oregon's biocriteria (OAR 340-041-0011) if this decant water is discharged to waters of the state such as fresh or estuarine wetlands?[80]

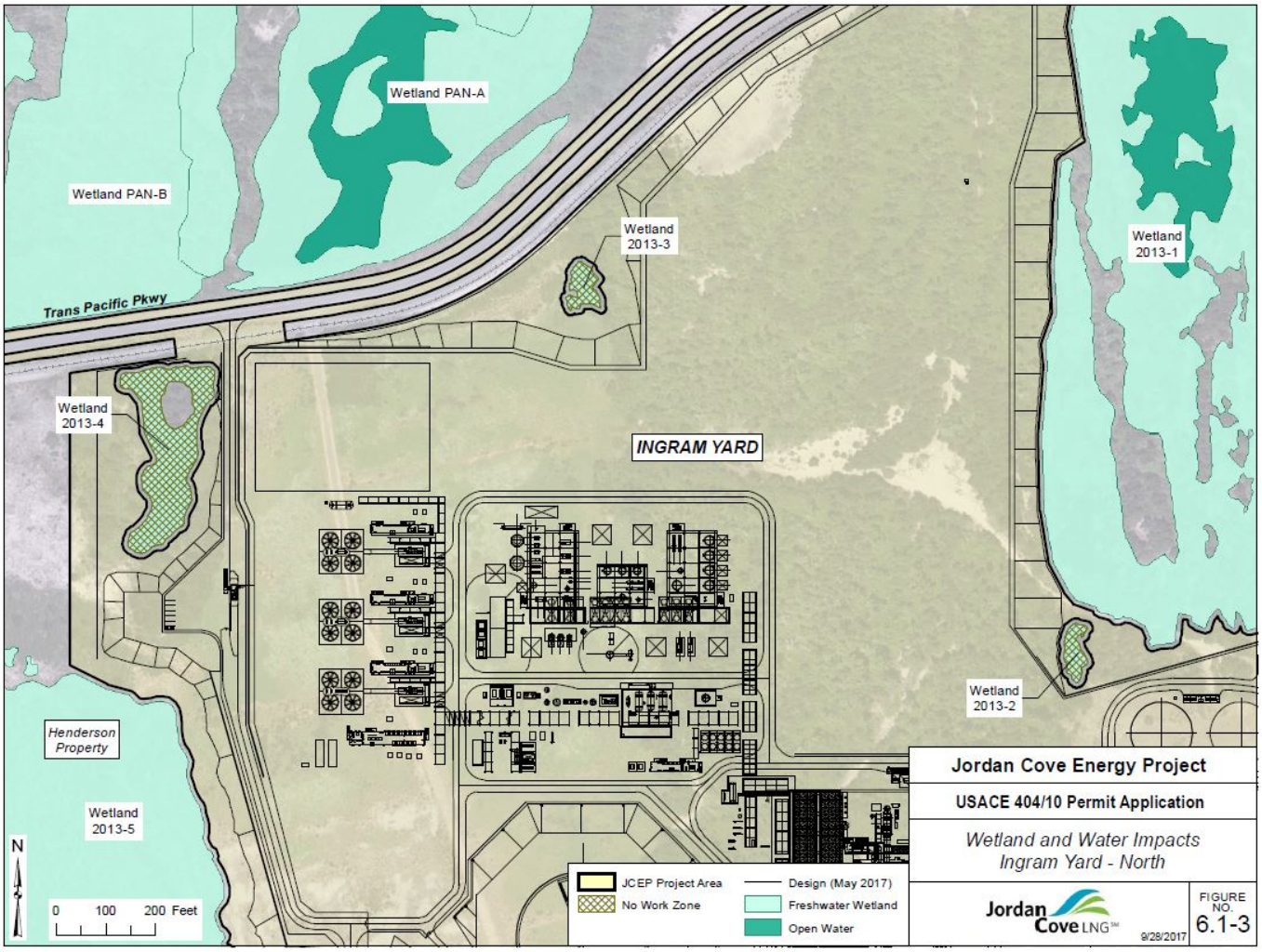
In correspondence dated February 20, 2019, JCEP proposed to address measures to demonstrate compliance with the biocriteria standard in a Dredging Pollution Prevention Plan. JCEP has not submitted a Dredging Pollution Prevention Plan that demonstrates how JCEP would minimize or mitigate the known likely violations of biocriteria standard. Accordingly, for the reasons discussed above, DEQ in unable to determine that JCEP's proposed management of dredged material will comply with OAR 340-041-0011.

[78] North American Vertical Datum of 1988.

[79] Jordan Cove Resource Report 1. September 2017.

[80] Supplemental Information Request. DEQ, December 20, 2018.

Figure 14: Wetland Areas Adjacent to LNG Terminal and Dredge Spoil Placement



6.2.3 DEQ Findings

Based on the preceding evaluation of Project effects, DEQ adopts the following findings related to OAR 340-041-0011 (Biocriteria):

1. JCEP has not demonstrated that the proposed pipeline construction, access road construction and maintenance, and pipeline right-of-way activities would avoid or mitigate detrimental changes in habitat structure and function, flow and resident biological communities;
2. JCEP has not demonstrated that the proposed road construction and maintenance activities would be conducted in a manner to avoid or mitigate detrimental changes in the resident biological communities;
3. JCEP has not demonstrated that the proposed pipeline construction, access road construction and maintenance, and pipeline right-of-way activities would identify and avoid or mitigate increases in landslide frequency that would result in detrimental changes in the resident biological communities;
4. JCEP's proposed management of stormwater in the Terminal and Off-Site Project Areas during construction and operation of the Project is likely to cause short and long-term alterations to wetland hydrology, turbidity, and form with sediment deposits, and these changes would result in detrimental alterations to the resident biological community dependent on these wetlands.
5. JCEP's management of stormwater and decant water during construction and operation of dredged material disposal sites is likely to cause short and long-term alterations to wetland hydrology, turbidity, and form with sediment deposits, and these alterations likely would result in detrimental changes to the resident biological community dependent on these wetlands.
6. JCEP proposes the permanent placement of marine sediments in upland locations that may alter the hydrologic and chemical characteristics of nearby wetland areas in a manner that would likely lead to violation of biocriteria, OAR 340-041-0011. Absent a plan to avoid or mitigate these effects, DEQ finds no reasonable assurance that these proposed activities would not violate the biocriteria standard. OAR 340-041-0011, OAR 340-048-0020(3).

6.3 Dissolved Oxygen

6.3.1 Applicable Standard

Oregon Administrative Rules 340-041-0016 set forth the state's water quality standards for dissolved oxygen. For spawning areas, the criteria range between 8.0 and 11.0 mg/l. For cold-water aquatic life, 8.0 mg/l is an absolute minimum. For cool water aquatic life, and for estuaries, dissolved oxygen may not be less than 6.5 mi/l: See, OAR 340-041-0016.

Dissolved oxygen is a principal parameter necessary to support of aquatic life. Adequate dissolved oxygen is vital to fish, invertebrates, and other aquatic life and can vary with life stages (egg, larvae, and adults). Maintaining adequate dissolved oxygen within gravels is particularly important during incubation of salmonid embryos.

Along the route of the proposed pipeline, the following waterbodies are listed as water quality limited for dissolved oxygen:

- North Fork of the Coquille River (all year)
- Middle Fork of the Coquille River (all year)
- South Umpqua River (all year)
- Bilger Creek (all year)
- North Myrtle Creek (May 15 – Oct 15)
- South Myrtle Creek (May 15 – Oct 15)
- Days Creek (May 15 – Oct 15)
- West Fork Trail Creek (Summer)
- Lick Creek (Summer)

- Klamath River (all year)
- Lost River (all year)

6.3.2 DEQ Evaluation: Dissolved Oxygen

6.3.2.1 Pipeline construction

Land disturbance during construction can cause organic and inorganic sediment discharge to streams as described above in section 6.1. Sediment loading directly impacts oxygen saturation potential and can reduce oxygen availability in spawning gravels.. In addition to sediment, the placement of slash and vegetation in waterbodies from land clearing activities can result in a reduction of dissolved oxygen, as can the introduction of runoff from lands that are fertilized for re-establishment of vegetation. Jordan Cove would need to manage these activities carefully in order to avoid adding pollutants that could reduce dissolved oxygen levels.

6.3.2.2 Waterbody Crossings

As discussed in Section 6.1.2.2 of this report, JCEP proposes to cross about 252 waterbodies (not including wetlands) using dry open-cut techniques. For the second South Umpqua River crossing (MP 94.73) JCEP proposes a diverted open cut crossing. For all other dry open-cut locations, JCEP proposes to temporarily dewater the work area using either fluming or dam-and-pump techniques.

Streamflow diversions can depress dissolved oxygen in several ways. First, bypassing streamflow through channelized diversions can alter natural stream function and reduce stream reaeration. Impoundments above the isolated work area may also reduce hydraulic energy that can further reduce saturation potential. In addition, solar gain and/or mechanical warming from transfer pumps may increase water temperature and reduce the dissolved oxygen saturation potential. Last, sediment releases following removal of the dam can increase oxygen demand below the work area.

JCEP states they intend to conduct stream crossings during seasonally low flow conditions. However, seasonally low flow conditions reduce the waterbody's capacity to assimilate pollutant loads without detrimental changes to water quality. According to DEQ's Antidegradation policy, up to a 0.1 mg/l decrease in dissolved oxygen from the upstream end of a stream reach to the downstream end of the reach is not considered a reduction in water quality so long as it has no adverse effects on threatened and endangered species.[81]

During pipeline construction, and as detailed above, JCEP proposes to cross 11 streams identified as impaired for dissolved oxygen. In these areas, no additional degredation of dissolved oxygen levels is allowed. These areas include the West Fork Trail Creek (MP 118.89), a perennial stream in a bedrock-dominated channel. This reach includes rearing and spawning habitat for ESA-listed Southern Oregon Northern California Coho salmon. JCEP proposes a dry open-cut crossing at this location, and JCEP provides no specific measures to mitigate water quality impacts. In addition, JCEP provides no water quality measures in the site specific restoration plan developed for this proposed crossing.[82]

The waterbody crossing at West Fork Trail Creek is impaired for dissolved oxygen and cannot assimilate additional pollutant loading without causing a violation of the standard. Because the actions proposed by JCEP are known to affect streamflow in ways that may decrease oxygen saturation potential, DEQ expects dry open-cut waterbody crossings would cause a violation of water quality standards. Furthermore, because smaller streams are more susceptible to water quality degradation from environmental stressors than streams with higher base flow, DEQ expects the JCEP's proposed actions would likely reduce oxygen saturation potential at other locations, as well.

[81] OAR 340-041-0004(3)(d).

[82] Stream Crossing Risk Analysis Addendum, Exhibit C-6. Pacific Connector Gas Pipeline, April 2018.

6.3.2.3 Road construction and Maintenance

Depending on the design, new road construction and the management of stormwater on existing roads can initiate debris flows into streams in landslides susceptibility zones. As noted in Sections 6.1.2.1 and 6.1.2.3, JCEP has not performed a comprehensive landslide hazard assessment to identify potential landslide risks associated with JCEP's proposed road use and construction. This assessment is necessary to mitigate landslide risks. Moreover, as noted in Section 6.1.2.3, JCEP has not conducted an inventory of existing access roads to identify road segments hydrologically connected to streams. This inventory is necessary for the development of a maintenance and improvement plan for existing access road to prevent and minimize sediment discharge to streams.

Debris flows initiated by roads can deposit substantial quantities of soil, coarse woody debris, and leaves into streams. Sediment discharge from road use also contains organic matter. The decomposition of this organic matter in streams can reduce dissolved oxygen. Given the lack of a comprehensive landslide hazard assessment and a road maintenance and improvement plan from JCEP, DEQ cannot conclude the proposed road use and construction would be conducted in a manner consistent with the dissolved oxygen standard.

6.3.2.4 Permanent Pipeline Right-of-Way

Depending on the design and operation of the pipeline right-of-way, the design cut and fill slopes and/or the stormwater management system can initiate debris flows into streams in landslides susceptibility zones. As noted in Sections 6.1.2.4, JCEP has not performed a comprehensive landslide hazard assessment to identify potential landslide risks associated with JCEP's pipeline right-of-way. This assessment is necessary to mitigate landslide risks. The design of the stormwater management system in the right-of-way can also discharge sediment containing organic matter into streams at crossings and near discharge points. The decomposition of organic debris in streams can reduce dissolved oxygen levels.

In a September 7, 2018 information request, DEQ requested that JCEP provide a post-construction stormwater management plan addressing DEQ's 401 plan submission guidelines as discussed in Section 6.1.2.4. JCEP has not provided DEQ with this post-construction stormwater management plan. DEQ does not have sufficient information from JCEP to evaluate whether minimization or mitigation measures would be sufficient to prevent or offset increases in dissolved oxygen levels caused by JCEP's proposed activities, including but not limited to its maintenance of the pipeline permanent right-of-way.

6.3.3 DEQ Findings: Dissolved Oxygen

Based on the preceding evaluation of Project effects, DEQ adopts the following findings related to OAR 340-041-0016 (Dissolved Oxygen):

1. JCEP has not demonstrated that the proposed pipeline construction, access road construction and maintenance, and pipeline right-of-way activities would avoid or mitigate adverse effects on dissolved oxygen, particularly in the 11 waterbody crossings where standards are not currently met and no additional loading is allowed. JCEP's proposed construction and use of temporary and permanent rights of way are land disturbance activities that would likely reduce oxygen availability in spawning gravels and likely result in organic and inorganic sediment discharge to streams in amounts inconsistent with dissolved oxygen standard.
2. JCEP's proposed activities do not include sufficient methods to minimize or mitigate for potential Project-related reductions in dissolved oxygen at proposed waterbody crossings or from the impacts of roads, including plans to avoid increases in the frequency of landslides from road construction and use.

Based upon these findings, DEQ concludes that it does not have a reasonable assurance that the proposed activities will be conducted in a manner that will not violate the Dissolved Oxygen water quality standard at OAR 340-41-0016.

6.4 Nuisance Phytoplankton Growth

6.4.1 Applicable Standard

The Nuisance Phytoplankton Growth standard is found in Oregon Administrative Rules 340-041-0019

The standard establishes average Chlorophyll-a values for water bodies where phytoplankton may impair the recognized beneficial uses.

6.4.2 DEQ Evaluation: Nuisance Phytoplankton Growth

Although several waterbodies are identified as water quality limited for Chlorophyll, DEQ does not expect the proposed Project to significantly affect conditions that would cause nuisance phytoplankton growth.

6.4.3 DEQ Findings

DEQ is reasonably assured the proposed Project will comply with the Nuisance Phytoplankton Growth water quality standard.

6.5 Hydrogen Ion Concentration (pH)

6.5.1 Applicable Standard

Oregon Administrative Rules 340-041-0021 provides that:

1) Unless otherwise specified in OAR 340-041-0101 through 340-041-0350, pH values (Hydrogen ion concentrations) may not fall outside the following ranges:

(a) Marine waters: 7.0-8.5;

(b) Estuarine and fresh waters: See basin specific criteria (OAR 340-041-0101 through 340-041-0350).

The applicable basin-specific criteria are presented in the table below.

Table 4: Basin-Specific Criteria: pH

	South Coast	Umpqua	Rogue	Klamath
Fresh (except Cascade lakes)	NA	NA	NA	6.5 – 9.0[a]
Estuarine & Fresh	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	NA
Marine	7.0 – 8.5	7.0 – 8.5	7.0 – 8.5	NA
Cascade lakes above 3,000 feet elev.	NA	6.0 – 8.5	6.0 – 8.5	NA
Cascade lakes above 5,000 feet elev.	NA	NA	NA	6.5 – 8.5

[a] When greater than 25 percent of ambient measurements taken between June and September are greater than pH 8.7, and as resources are available according to priorities set by the Department, the Department would determine whether the values higher than 8.7 are anthropogenic or natural in origin.

6.5.2 DEQ Evaluation: pH

Surface waters are susceptible to changes in pH caused by several factors including chemical releases, elevation, temperature, and biological processes such as photosynthesis and algal respiration. Surface water pH varies regionally throughout Oregon. External factors that cause aquatic pH to exceed regional ranges may stress biological functions of aquatic receptors. In addition, water column pH also determines the solubility and

biological availability of chemical constituents such as nutrients (e.g., phosphorus, nitrogen, and carbon) and heavy metals (e.g. lead and copper). In the case of certain heavy metals, water column pH also determines their toxicity.

The South Umpqua (Clark Branch) is water quality limited for pH. JCEP proposed to place the pipeline under the river bed via the direct pipe method.

Days Creek also is water quality limited for pH during the summer, as is the Rogue River. The Rogue River crossing is proposed as a HDD boring under the river bed. Butte Creek also is water quality limited for pH during the summer, as is the Klamath River (HDD bore).

6.5.2.1 Road Construction and Maintenance

Depending on the design, new road construction and the management of stormwater on existing roads can initiate debris flows into streams in landslides susceptibility zones. As noted in Sections 6.1.2.1 and 6.1.2.3, JCEP has not performed a comprehensive landslide hazard assessment to identify potential landslide risks associated with JCEP's proposed road use and construction. Debris flows initiated by roads can deposit substantial quantities of soil, coarse woody debris, and leaves into streams. The pH of the soil input, the pH the receiving water, the underlying bedrock geology, and the composition of the stream microbial community interact to influence the decomposition of this deposited organic matter. The decomposition of these organic matter inputs may alter stream pH. For example, over time, decaying leaves in streams can increase pH.[83] The decomposition of roots, wood, and bark release tannins such as tannic acid, which can lower stream pH. Without site-specific information on the source of debris flow, the chemistry of the receiving stream, and a comprehensive landslide hazard assessment, DEQ cannot conclude there is a reasonable assurance that the proposed road use and construction will be conducted in a manner that will not violate the pH standard.

6.5.2.2 Pipeline Right-of-Way

The pipeline's permanent easement would alter the surface hydrology and local stormwater runoff characteristics. Increased sediment loading to hydrologically connected streams may likely affect certain water quality characteristics including increasing pH in such waterbodies. On September 7, 2018, DEQ requested JCEP prepare and submit a post-construction stormwater management plan with procedures to manage the discharge of pollutants from the 1,373.66 acres of permanent right-of-way occupied by the pipeline. Because JCEP has not provided DEQ with the required management plan, DEQ cannot determine whether the proposed operation of the pipeline would meet the pH standard.

6.5.3 DEQ Findings

Based upon these findings, violations of the pH standard may occur in a few locations where the standard is not currently being met. JCEP has not identified methods to assure that no additional loading will occur in these areas whether the pipeline would cross a waterbody that is limited for pH. DEQ concludes that it does not have a reasonable assurance that the proposed activities will be conducted in a manner that will not violate the pH water quality standard at OAR 340-41-0021.

6.6 Temperature

Oregon's water quality standard for temperature is complex. Oregon Administrative Rules 340-041-0028. It include biologically based numeric criteria for waterbodies supporting salmonids, a numeric standard for the ocean and bays, a standard for waterbodies supporting cool water species, and a standard for protecting cold water in salmon, steelhead and bull trout waterbodies. In the numerous waterbodies that do not meet these standards, if there is a TMDL, the TMDL will contain allocations for non-point sources, and require implementation plans,

[83] Deano, Paula M. and J. W. Robinson. 1985. *The Effect of Decaying Leaves on pH and Buffer Capacity of Waters*. Journal of Environmental Science and Health. Volume 20: 903-911

including from the BLM and the USFS. Typically, these plans limit the increase in temperature from all anthropogenic sources to no more than 0.3 degrees C. If no TMDL has been adopted, a new source may be allowed only if it is demonstrated that the source will not add to temperature loads. This could be done through a temperature implementation plan, and could include mitigation, so long as the mitigation is in the same watershed.

Biologically based numeric temperature criteria applicable to the Project are determined by the Fish Use and Spawning Maps presented as Figures 340A and 340B of Oregon Administrative Rule 340, Division 041. Figure 340A designates the entire project as suitable habitat for bull trout. The seven-day-average maximum temperature of a stream identified as having bull trout spawning and juvenile rearing use is 12.0 degrees Celsius year round.

6.6.1 Applicable Standard

Oregon Administrative Rules 340-041-0028:

(1) Background. Water temperatures affect the biological cycles of aquatic species and are a critical factor in maintaining and restoring healthy salmonid populations throughout the State. Water temperatures are influenced by solar radiation, stream shade, ambient air temperatures, channel morphology, groundwater inflows, and stream velocity, volume, and flow. Surface water temperatures may also be warmed by anthropogenic activities such as discharging heated water, changing stream width or depth, reducing stream shading, and water withdrawals.

(2) Policy. It is the policy of the Commission to protect aquatic ecosystems from adverse warming and cooling caused by anthropogenic activities. The Commission intends to minimize the risk to cold-water aquatic ecosystems from anthropogenic warming, to encourage the restoration and protection of critical aquatic habitat, and to control extremes in temperature fluctuations due to anthropogenic activities. The Commission recognizes that some of the State's waters will, in their natural condition, not provide optimal thermal conditions at all places and at all times that salmonid use occurs. Therefore, it is especially important to minimize additional warming due to anthropogenic sources. In addition, the Commission acknowledges that control technologies, best management practices and other measures to reduce anthropogenic warming are evolving and that the implementation to meet these criteria will be an iterative process. Finally, the Commission notes that it will reconsider beneficial use designations in the event that man-made obstructions or barriers to anadromous fish passage are removed and may justify a change to the beneficial use for that water body.

(3) Purpose. The purpose of the temperature criteria in this rule is to protect designated temperature-sensitive, beneficial uses, including specific salmonid life cycle stages in waters of the State.

(4) Biologically Based Numeric Criteria. Unless superseded by the natural conditions criteria described in section (8) of this rule, or by subsequently adopted site-specific criteria approved by EPA, the temperature criteria for State waters supporting salmonid fishes are as follows:

(a) The seven-day-average maximum temperature of a stream identified as having salmon and steelhead spawning use on subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Tables 101B, and 121B, and Figures 130B, 151B, 160B, 170B, 220B, 230B, 271B, 286B, 300B, 310B, 320B, and 340B, may not exceed 13.0 degrees Celsius (55.4 degrees Fahrenheit) at the times indicated on these maps and tables;

(b) The seven-day-average maximum temperature of a stream identified as having core cold water habitat use on subbasin maps set out in OAR 340-041-101 to 340-041-340: Figures 130A, 151A, 160A, 170A, 180A, 201A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 16.0 degrees Celsius (60.8 degrees Fahrenheit);

(c) The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration use on subbasin maps set out at OAR 340-041-0101 to 340-041-0340: Figures 130A, 151A, 160A,

170A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit);

(d) The seven-day-average maximum temperature of a stream identified as having a migration corridor use on subbasin maps and tables OAR 340-041-0101 to 340-041-0340: Tables 101B, and 121B, and Figures 151A, 170A, 300A, and 340A, may not exceed 20.0 degrees Celsius (68.0 degrees Fahrenheit). In addition, these water bodies must have cold water refugia that are sufficiently distributed so as to allow salmon and steelhead migration without significant adverse effects from higher water temperatures elsewhere in the water body. Finally, the seasonal thermal pattern in Columbia and Snake Rivers must reflect the natural seasonal thermal pattern;

(e) The seven-day-average maximum temperature of a stream identified as having Lahontan cutthroat trout or redband trout use on subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Tables 121B, 140B, 190B, and 250B, and Figures 180A, 201A, 260A and 310A may not exceed 20.0 degrees Celsius (68.0 degrees Fahrenheit);

(f) The seven-day-average maximum temperature of a stream identified as having bull trout spawning and juvenile rearing use on subbasin maps set out at OAR 340-041-0101 to 340-041-0340: Figures 130B, 151B, 160B, 170B, 180A, 201A, 260A, 310B, and 340B, may not exceed 12.0 degrees Celsius (53.6 degrees Fahrenheit). From August 15 through May 15, in bull trout spawning waters below Clear Creek and Mehlhorn reservoirs on Upper Clear Creek (Pine Subbasin), below Laurance Lake on the Middle Fork Hood River, and below Carmen reservoir on the Upper McKenzie River, there may be no more than a 0.3 degrees Celsius (0.5 Fahrenheit) increase between the water temperature immediately upstream of the reservoir and the water temperature immediately downstream of the spillway when the ambient seven-day-average maximum stream temperature is 9.0 degrees Celsius (48 degrees Fahrenheit) or greater, and no more than a 1.0 degree Celsius (1.8 degrees Fahrenheit) increase when the seven-day-average stream temperature is less than 9 degrees Celsius.

(5) Unidentified Tributaries. For waters that are not identified on the “Fish Use Designations” maps referenced in section (4) of this rule, the applicable criteria for these waters are the same criteria as is applicable to the nearest downstream water body depicted on the applicable map. This section (5) does not apply to the “Salmon and Steelhead Spawning Use Designations” maps.

(6) Natural Lakes. Natural lakes may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the natural condition unless a greater increase would not reasonably be expected to adversely affect fish or other aquatic life. Absent a discharge or human modification that would reasonably be expected to increase temperature, DEQ will presume that the ambient temperature of a natural lake is the same as its natural thermal condition.

(7) Oceans and Bays. Except for the Columbia River above river mile 7, ocean and bay waters may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the natural condition unless a greater increase would not reasonably be expected to adversely affect fish or other aquatic life. Absent a discharge or human modification that would reasonably be expected to increase temperature, DEQ will presume that the ambient temperature of the ocean or bay is the same as its natural thermal condition.

(8) Natural Conditions Criteria. Where the department determines that the natural thermal potential of all or a portion of a water body exceeds the biologically-based criteria in section (4) of this rule, the natural thermal potential temperatures supersede the biologically-based criteria, and are deemed to be the applicable temperature criteria for that water body.

NOTE: On August 8, 2013, the Environmental Protection Agency disapproved rule section OAR 340-041-0028(8). Consequently, section (8) is no longer effective as a water quality criterion for purposes of CWA Section 303(c) and it cannot be used for issuing certifications under CWA Section 401, permits under CWA Section 402, or total maximum daily loads under CWA section 303(d).

(9) Cool Water Species.

(a) No increase in temperature is allowed that would reasonably be expected to impair cool water species. Waters of the State that support cool water species are identified on subbasin tables and figures set out in OAR 340-041-0101 to 340-041-0340; Tables 140B, 190B and 250B, and Figures 180A, 201A and 340A.

(b) See OAR 340-041-0185 for a basin specific criterion for the Klamath River.

(10) Borax Lake Chub. State waters in the Malheur Lake Basin supporting the Borax Lake chub may not be cooled more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) below the natural condition.

(11) Protecting Cold Water.

(a) Except as described in subsection (c) of this rule, waters of the State that have summer seven-day-average maximum ambient temperatures that are colder than the biologically based criteria in section (4) of this rule, may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the colder water ambient temperature. This provision applies to all sources taken together at the point of maximum impact where salmon, steelhead or bull trout are present.

(b) A point source that discharges into or above salmon & steelhead spawning waters that are colder than the spawning criterion, may not cause the water temperature in the spawning reach where the physical habitat for spawning exists during the time spawning through emergence use occurs, to increase more than the following amounts after complete mixing of the effluent with the river:

(A) If the rolling 60 day average maximum ambient water temperature, between the dates of spawning use as designated under subsection (4)(a) of this rule, is 10 to 12.8 degrees Celsius, the allowable increase is 0.5 Celsius above the 60 day average; or

(B) If the rolling 60 day average maximum ambient water temperature, between the dates of spawning use as designated under subsection (4)(a) of this rule, is less than 10 degrees Celsius, the allowable increase is 1.0 Celsius above the 60 day average, unless the source provides analysis showing that a greater increase will not significantly impact the survival of salmon or steelhead eggs or the timing of salmon or steelhead fry emergence from the gravels in downstream spawning reach.

(c) The cold water protection narrative criteria in subsection (a) do not apply if:

(A) There are no threatened or endangered salmonids currently inhabiting the water body;

(B) The water body has not been designated as critical habitat; and

(C) The colder water is not necessary to ensure that downstream temperatures achieve and maintain compliance with the applicable temperature criteria.

(12) Implementation of the Temperature Criteria.

(a) Minimum Duties. There is no duty for anthropogenic sources to reduce heating of the waters of the State below their natural condition. Similarly, each anthropogenic point and nonpoint source is responsible only for controlling the thermal effects of its own discharge or activity in accordance with its overall heat contribution. In no case may a source cause more warming than that allowed by the human use allowance provided in subsection (b) of this rule.

(b) Human Use Allowance. Insignificant additions of heat are authorized in waters that exceed the applicable temperature criteria as follows:

(A) Prior to the completion of a temperature TMDL or other cumulative effects analysis, no single NPDES point source that discharges into a temperature water quality limited water may cause the temperature of the water body to increase more than 0.3 degrees Celsius (0.5 Fahrenheit) above the applicable criteria after mixing with either twenty five (25) percent of the stream flow, or the temperature mixing zone, whichever is more restrictive; or

(B) Following a temperature TMDL or other cumulative effects analysis, waste load and load allocations will restrict all NPDES point sources and nonpoint sources to a cumulative increase of no greater than 0.3 degrees Celsius (0.5 Fahrenheit) above the applicable criteria after complete mixing in the water body, and at the point of maximum impact.

(C) Point sources must be in compliance with the additional mixing zone requirements set out in OAR 340-041-0053(2)(d).

(D) A point source in compliance with the temperature conditions of its NPDES permit is deemed in compliance with the applicable criteria.

(c) Air Temperature Exclusion. A water body that only exceeds the criteria set out in this rule when the exceedance is attributed to daily maximum air temperatures that exceed the 90th percentile value of annual maximum seven-day average maximum air temperatures calculated using at least 10 years of air temperature data, will not be listed on the section 303(d) list of impaired waters and sources will not be considered in violation of this rule.

(d) Low Flow Conditions. An exceedance of the biologically-based numeric criteria in section (4) of this rule, or an exceedance of the natural condition criteria in section (8) of this rule will not be considered a permit violation during stream flows that are less than the 7Q10 low flow condition for that water body.

(e) Other Nonpoint Sources. The department may, on a case-by-case basis, require nonpoint sources (other than forestry and agriculture), including private hydropower facilities regulated by a 401 water quality certification, that may contribute to warming of State waters beyond 0.3 degrees Celsius (0.5 degrees Fahrenheit), and are therefore designated as water-quality limited, to develop and implement a temperature management plan to achieve compliance with applicable temperature criteria or an applicable load allocation in a TMDL pursuant to OAR 340-042-0080.

(A) Each plan must ensure that the nonpoint source controls its heat load contribution to water temperatures such that the water body experiences no more than a 0.3 degrees Celsius (0.5 degree Fahrenheit) increase above the applicable criteria from all sources taken together at the maximum point of impact.

(B) Each plan must include a description of best management practices, measures, effluent trading, and control technologies (including eliminating the heat impact on the stream) that the nonpoint source intends to use to reduce its temperature effect, a monitoring plan, and a compliance schedule for undertaking each measure.

(C) The Department may periodically require a nonpoint source to revise its temperature management plan to ensure that all practical steps have been taken to mitigate or eliminate the temperature effect of the source on the water body.

(f) Compliance Methods. Anthropogenic sources may engage in thermal water quality trading in whole or in part to offset its temperature discharge, so long as the trade results in at least a net thermal loading decrease in anthropogenic warming of the water body, and does not adversely affect a threatened or endangered species. Sources may also achieve compliance, in whole or in part, by flow augmentation, hyporheic exchange flows, outfall relocation, or other measures that reduce the temperature increase caused by the discharge.

(g) Release of Stored Water. Stored cold water may be released from reservoirs to cool downstream waters in order to achieve compliance with the applicable numeric criteria. However, there can be no significant adverse impact to downstream designated beneficial uses as a result of the releases of this cold water, and the release may not contribute to violations of other water quality criteria. Where the Department determines that the release of cold water is resulting in a significant adverse impact, the Department may require the elimination or mitigation of the adverse impact.

(13) Site-Specific Criteria. The Department may establish, by separate rulemaking, alternative site-specific criteria for all or a portion of a water body that fully protects the designated use.

(a) These site-specific criteria may be set on a seasonal basis as appropriate.

(b) The Department may use, but is not limited by the following considerations when calculating site-specific criteria:

(A) Stream flow;

(B) Riparian vegetation potential;

(C) Channel morphology modifications;

(D) Cold water tributaries and groundwater;

(E) Natural physical features and geology influencing stream temperatures; and

(F) Other relevant technical data.

(c) DEQ may consider the thermal benefit of increased flow when calculating the site-specific criteria.

(d) Once established and approved by EPA, the site-specific criteria will be the applicable criteria for the water bodies affected.

6.6.2 DEQ Evaluation

6.6.2.1 Pipeline construction

In developing the construction right-of-way and construction access roads for the pipeline, JCEP would clear all trees and shrubs. The width of this vegetation clearing would be 95 feet and, according to JCEP, would "neck down" (i.e., narrow) to 75 feet through wetlands and waterbody crossings. However, JCEP's Environmental Alignment Sheets do not show this narrowing of the construction ROW at any of the stream crossings as indicated in Section 1.2.1.1 of Resource Report 1 (see Figures 15 and 16). Further, it appears that JCEP's analysis fails to include consideration of the pipeline alignment when in runs parallel to waterbodies, as it does in the vicinity of Spencer Creek (discussed in more detail below). The analysis also fails to account for changes in vegetation and warming as a result of new roadways, widening of existing roadways and the development of Temporary Extra Work Areas (TEWAs). All of these activities would increase thermal loading to waterbodies unless they are adequately set back. The riparian protection rules adopted by the Oregon Department of Forestry to comply with Oregon's temperature standard require retention of all trees within specified distances of streams with salmon, steelhead or bull trout (typically 60 to 80 feet for small and medium-sized streams). OAR 629-642-0105.

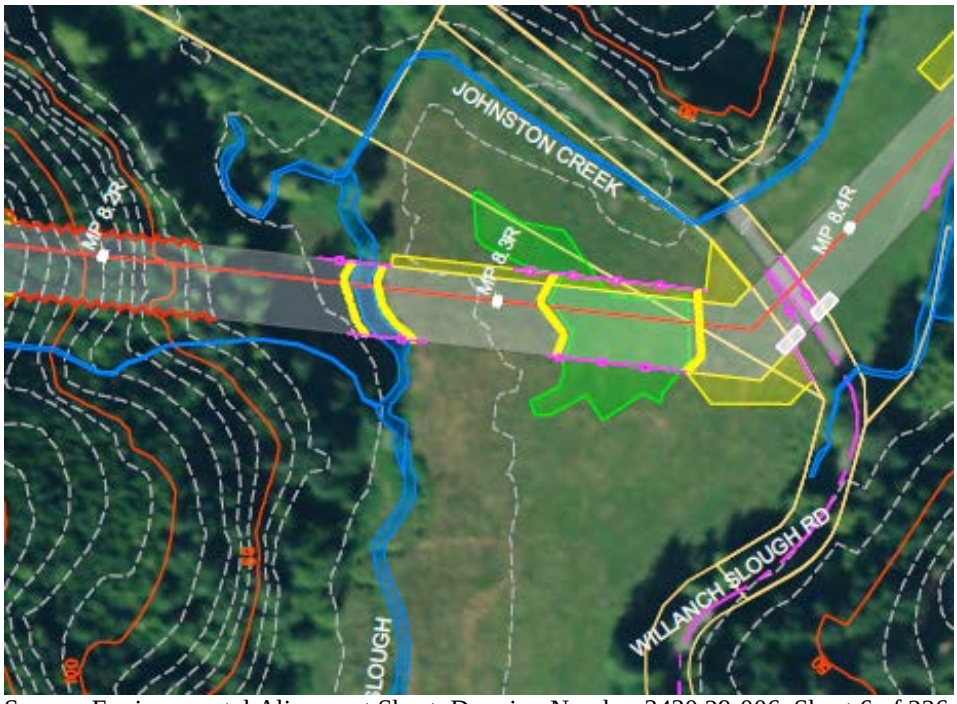
After the installation of the pipeline, JCEP would restore the vegetation removed during construction except within the 30-foot permanent right-of-way as discussed in Section 6.7.2.4 below. As a result, there would be a time lag between the removal of vegetation providing shade to waterbodies, and the reestablishment of that shade cover.

Based on FERC requirements its Wetland and Waterbody Procedures, JCEP can develop the construction right-of-way within 15 feet of streams when paralleling a stream. These procedures are significantly less protective than Oregon water quality requirements, and would allow increased thermal gain for these areas. On Forest Service and Bureau of Land Management administered public lands, JCEP proposes to site TEWAs 50 feet from streams, thereby providing somewhat more protection from increased thermal radiation to adjacent waterbodies. JCEP has not provided DEQ information regarding the setback for TEWAs at stream crossings on private land.

In its September 7, 2018 information request, DEQ requested that JCEP evaluate compliance with Total Maximum Daily Load allocations and with Designated Management Agencies' Total Maximum Daily Implementation Plans. DEQ has not received information on JCEP's compliance with TMDL allocations for temperature.

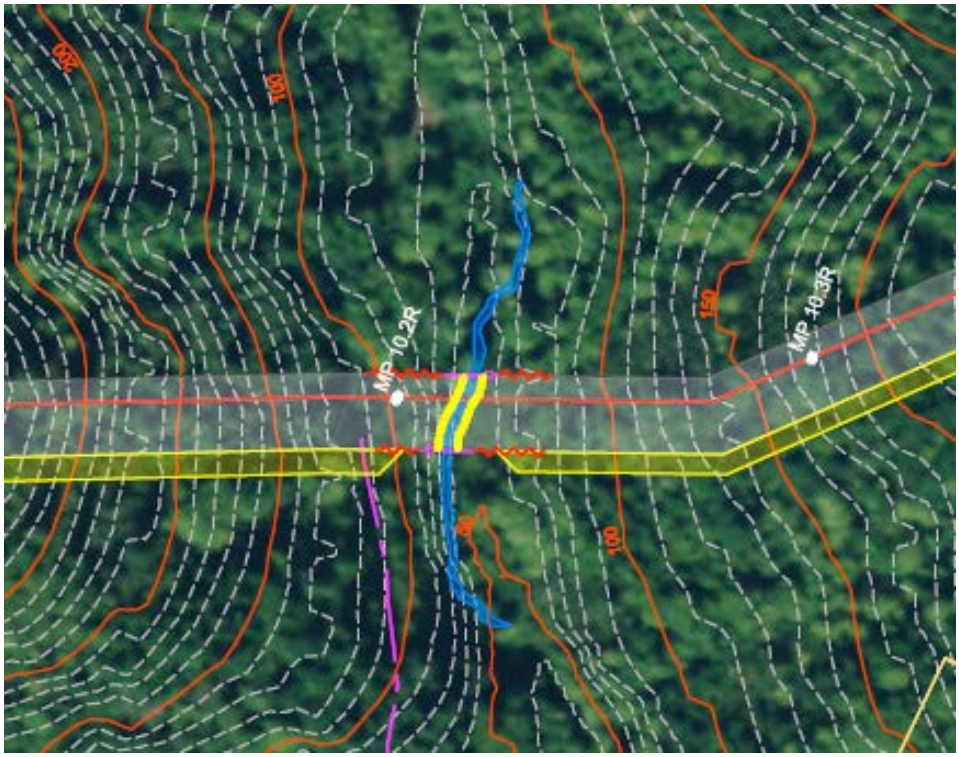
As an illustration of the reasons for DEQ's concerns about the temperature impacts of the proposed Project, at pipeline stream crossing at Milepost 58.78, Ollala Creek is limited for temperature year round and is under an approved TMDL. Similarly, DEQ has placed Rice Creek (Milepost 65.76), South Umpqua River (Milepost 71.27), North Myrtle Creek (Milepost 79.12), South Myrtle Creek (Milepost 81.19), and many others on the 303(d) list for temperature. These streams are under an approved temperature TMDL.

Figure 15: Pipeline Crossing at Wetland S1-04 (Willanch Slough) showing no "neckdown" of the ROW



Source: Environmental Alignment Sheet, Drawing Number 3430.29-006, Sheet 6 of 226.

Figure 16: Pipeline Crossing at Tributary to Cooston Channel showing no "neckdown" of ROW



Source: Environmental Alignment Sheet, Drawing Number 3430.29-008, Sheet 8 of 226.

For streams listed as impaired for temperature on the 303(d) list but not under temperature TMDL, Pacific Connector may not increase thermal loading leading to higher stream temperatures without effective mitigation. In Oregon's 2012 Integrated Report Assessment Database and 303(d) list, these streams are assigned an assessment category of five indicating a TMDL is needed to ensure these streams achieve the water quality standard. The lack of a temperature TMDL for Category 5 streams means DEQ has not established a human use allowance and reserve capacity for these streams. The reserve capacity in a TMDL ensures that loading capacity has been set aside for a safety margin and is otherwise unallocated.[84] Moreover, the human use allowance in the temperature standard does not permit a source to cause more warming than allowed under this allowance as stated in OAR 340-041-0028(12)(b).[85] Pacific Connector proposes to remove effective riparian shade on the following temperature limited Category 5 streams: North Fork Coquille River at Milepost 23.06, Middle Creek at Milepost 27.04, East Fork Coquille River at Milepost 29.85, Elk Creek at Milepost 32.40, Upper Rock Creek at Milepost 44.21, Middle Fork Coquille River at Milepost 50.28, Spencer Creek at Milepost 171.07, and Lost River at Milepost 212.07.

In evaluating compliance with TMDL Implementation Plans, DEQ's request was – in part – to determine if JCEP evaluated the thermal impact to streams from riparian vegetation removal during the development of the proposed 922.64 acres of TEWAs. DEQ was also seeking to determine JCEP's compliance with FERC's 15-foot buffer requirements noted above impacted riparian vegetation and if these impacts were evaluated in the 2017 Thermal Impact Assessment.

For example, given the proposed pipeline route, Figure 10 shows the potential for the loss of effective shade from the construction right-of-way as the pipeline parallels Spencer Creek near Milepost 177. Spencer Creek is listed as impaired for temperature. JCEP informed DEQ that the riparian impacts from TEWAs and impacts from FERC's 15-feet buffer requirement, noted above, were not included in the 2017 Thermal Impact Assessment. DEQ requested that JCEP include these impacts in a revised assessment. To-date, JCEP has not provided this revision.

Additionally, in the Draft Environmental Impact Statement for this proposed project (see Figure 3.4-2), JCEP is considering a pipeline route change referred to as the Blue Ridge Variation. This potential route change would also necessitate adjustments to the 2017 Thermal Impact Assessment. Moreover, in its September 7, 2018 information request (see Page 6 of 15, Attachment B), DEQ also requested information summarizing JCEP's action to first avoid riparian impacts then, if avoidance is not possible, minimize these impacts prior to siting TEWAs and the construction right-of-way parallel to streams. In DEQ's information request, DEQ noted it was seeking the location of these riparian impacts and the detailed rationale justifying these impacts. Specifically, DEQ was seeking information on the specific constraints and operational procedures at each site preventing avoidance or minimization.

In January 2019, DEQ received information from JCEP that the detailed justification for riparian impacts that DEQ was seeking was in Table A.1-1 of the Department of State Lands and Army Corps of Engineers Joint Permit Application. DEQ reviewed this information and found that it focuses primarily on wetland impacts associated with the siting of a TEWA rather than riparian impacts and temperature changes in streams. The modification rationale presented in this table provides no information regarding alternative locations for TEWAs that JCEP considered and provides no detailed explanation why these alternative locations were unsuitable. Moreover, DEQ cannot determine from the information in Table A.1-1 if riparian impacts from the construction ROW are a result of FERC's 15-foot buffer guidelines or some other factor, as the columns of information in this table present only information on the wetlands impacted, Cowardin Type for each wetland impacted, and TEWAs involved in the impact. From Table A.1-1, DEQ cannot find information on why JCEP could not avoid or minimize impacts to effective shade to streams when siting TWEAs and the construction ROW parallel to a stream.

In sum, DEQ cannot determine if JCEP avoided or minimized proposed impacts to riparian shade particularly for streams listed as impaired for temperature and currently under a TMDL such as Spencer Creek shown in Figure 10.

[84] Oregon Administrative Rule OAR 340-041-0002(49)

[85] Oregon Administrative Rule OAR 340-041-0028(12)(a)

Absent revision to the 2017 Thermal Impact Assessment, DEQ does not have a thermal impact assessment considering the riparian shade impacts described above (additional impacts from roadway alterations are addressed below).

In addition, DEQ has not received a detailed mitigation plan from JCEP identifying the following:

1. The mitigation site location.
2. The site-specific schedule for mitigation.
3. The site-specific riparian restoration plan including drawings.
4. Proposed planting density.
5. A proposed plant species composition.
6. A strategy to ensure seedling survival.
7. A maintenance schedule to ensure the trees are free to grow.
8. Performance standards for mitigation sites.
9. A mechanism for ensuring the mitigation persists in perpetuity.
10. Access for DEQ to evaluate the mitigation actions.

It appears from the FERC DEIS that JCEP is proposing some mitigation for losses to riparian areas on USFS and BLM lands. However, the proposed mitigation appears to be located in watersheds other than those where impacts would occur. In order for mitigation to be considered in relation to Oregon's temperature standard, it must occur in the same watershed.

Given the incomplete thermal impact assessment from pipeline construction (including TEWAs) and the lack of thermal mitigation plan to restore and protect effective shade, DEQ determines that it does not have a reasonable assurance that Pacific Connector's pipeline construction will comply with the applicable temperature standards.

6.6.2.2 Waterbody Crossings

The information JCEP provided to evaluate thermal loading from proposed water body crossings is incomplete and does not demonstrate JCEP would prevent stream temperature increases when constructing the pipeline through streams. Pipeline installations at the trenched open-cut waterbody crossings proposed by JCEP require the management of surface and groundwater resources in a manner that may negatively affect temperature. For waterbody crossings completed using dry open-cut methods, JCEP would isolate the work area using temporary upstream and downstream dams. The excavation through the work area would presumably capture shallow groundwater as well as seepage through the temporary flume dams. Water from the excavation would be pumped to dewater structures in upland areas where it would infiltrate into soil.

Many of the proposed dry open-cut crossings occur in headwater streams that are tributaries to fish-bearing streams lower in the watershed. Headwater streams provide a critical source of cold water particularly in summer months when flows decline and a higher fraction of base flow is derived from subsurface groundwater. In addition, JCEP proposes many waterbody crossings at streams listed as impaired for temperature on Oregon's 303(d) list of impaired waterbodies. Dewatering actions proposed by JCEP would reduce the volume of cold groundwater available for hyporheic exchange in the reach below each waterbody crossing. This reduction in groundwater exchange below crossings would reduce the assimilative capacity for thermal loading. JCEP proposes to alter groundwater flow at numerous stream to construct its pipeline. Many of these streams are currently impaired for temperature. For example, at pipeline stream crossing at Milepost 58.78, Ollala Creek is limited for temperature year round and is under an approved TMDL. Similarly, DEQ has placed Rice Creek (Milepost 65.76), South Umpqua River (Milepost 71.27), North Myrtle Creek (Milepost 79.12), South Myrtle Creek (Milepost 81.19), and many others on the 303(d) list for temperature. These streams are under an approved temperature TMDL.
In its September 7, 2018 information request, DEQ requested information on JCEP's Shallow Groundwater Study revised August 24, 2017. Under Oregon Administrative Rule 340-048-0042(2)(e), DEQ was seeking to determine if potential modifications of groundwater flows during pipeline construction would affect surface water quality

and, in particular, stream temperature from the alteration of groundwater flows into streams (see Page 14 of 15, Attachment B). In its October 8, 2018 response to DEQ's request, JCEP informed DEQ that the purpose of shallow groundwater study was to aid pipeline design to account for buoyancy in areas of shallow groundwater and referred DEQ to the Erosion Control Revegetation Plan for practices regarding trench dewatering to manage groundwater inflows. In DEQ's December 20, 2018 response to JCEP's response, DEQ again requested a completed shallow groundwater study, provided the rationale for this specific information request, and provided guidance on the specific information DEQ was seeking. DEQ has not received the information requested.

As noted, dry crossings accomplished by flumed or pumped diversions would rely on an impoundment above the crossing where pumps or gravity-operated flume pipes can bypass streamflow below the work area. Impoundments typically would increase temperature by exposing an increased wetted surface area to solar gain. Given this increase in thermal load as well as the reduction in groundwater flows into streams, proposed activities are likely to cause violations of the temperature standard.

DEQ expects that trenched open-cut waterbody crossings would increase thermal loading of streams below certain crossing locations. The potential for thermal loading is greatest in headwater streams with low seasonal baseflow. DEQ has requested additional information on the effect of these actions on shallow groundwater, but to date has not received the requested information. Based on the information currently available DEQ cannot determine that trenched open-cut waterbody crossings will not violate the temperature water quality standard. The FERC DEIS refers to the 2017 GeoEngineers report prepared for JCEP. That report identified average impacts for fifteen streams (0.03 degrees F) and a maximum increase of 0.3 degree F. However, as noted above this analysis did not consider the impacts of stream crossings together with TEWAs, new and altered roadways, or areas where the pipeline alignment (or roadways) parallel streams.

6.6.2.3 Road construction and Maintenance

JCEP's road improvements include replacing existing culverts in stream crossings, installing temporary bridges, and widening roads. JCEP may clear riparian vegetation adjacent to the approaches for road-stream crossings to create space for the increased crossing footprint. This increased crossing footprint may reduce effective shade at a reach. This reduction in effective shade may be permanent. JCEP has not provided information regarding these impacts for DEQ to evaluate the duration of impact. In addition, road widening that parallels a stream may reduce effective shade in the riparian areas between the access road and stream.

JCEP provided DEQ with a 2017 Thermal Impact Assessment (GeoEngineers 2017) addressing projected thermal impacts of the pipeline crossings of selected waterbodies, but it appears that riparian impacts from proposed improvements to existing and new access roads were not evaluated in this report.

Moreover, DEQ has not received a detailed mitigation plan from JCEP.

For these reasons, DEQ is unable to determine that JCEP's proposed roadway construction and maintenance associated with the Project will comply with Oregon's water quality standard for temperature, particularly with regard to the many water quality limited streams potentially affected by the Project.

6.6.2.4 Permanent Pipeline Right-of-Way

The information JCEP provided to evaluate thermal loading from pipeline operation is incomplete and does not demonstrate JCEP would be able to mitigate unavoidable permanent thermal loading consistent with applicable temperature standard. In developing the permanent rights-of-way, JCEP would clear all trees and shrubs. Initially, the width of this vegetation clearing would be 95 feet and, according to JCEP, "neck down" (i.e., narrow) to 75 feet through wetlands and waterbody crossings. After the construction ROW, JCEP would maintain a 30-foot permanent ROW in herbaceous and herbaceous/small shrub vegetative condition. Specifically, to protect the pipeline from tree roots, JCEP would maintain 10 feet of the permanent ROW in an herbaceous state centered on the pipeline. JCEP would maintain the remainder of the 30-foot permanent ROW in an herbaceous/small shrub

condition for the operational life of the pipeline. For riparian areas permanently impacted by the operational right-of-way, JCEP would propose sites it would use to mitigate the permanent loss of riparian shade at the pipeline's stream crossings. DEQ has received no details regarding the mitigation of riparian shade impacts.

Moreover, based on FERC requirements its Wetland and Waterbody Procedures, JCEP may develop the rights-of-way within 15 feet of streams when paralleling a stream. This proximity reduces effective shade on these streams. In its September 7, 2018 information request, DEQ requested that JCEP evaluate compliance with Total Maximum Daily Load allocations and with Designated Management Agencies' Total Maximum Daily Implementation Plans for temperature.

For streams listed as impaired for temperature on the 303(d) list but not under temperature TMDL, Pacific Connector may not increase thermal loading leading to higher stream temperatures. In Oregon's 2012 Integrated Report Assessment Database and 303(d) list, these streams are assigned an assessment category of five indicating a TMDL is needed to ensure these streams achieve the water quality standard. The lack of a temperature TMDL for Category 5 streams means DEQ has not established a human use allowance and reserve capacity for these streams. The reserve capacity in a TMDL ensures that loading capacity has been set aside for a safety margin and is otherwise unallocated.[86] Moreover, the human use allowance in the temperature standard does not permit a source to cause more warming than allowed under this allowance as stated in OAR 340-041-0028(12)(b).[87] Pacific Connector proposes to remove effective riparian shade permanently on the following temperature limited Category 5 streams: North Fork Coquille River at Milepost 23.06, Middle Creek at Milepost 27.04, East Fork Coquille River at Milepost 29.85, Elk Creek at Milepost 32.40, Upper Rock Creek at Milepost 44.21, Middle Fork Coquille River at Milepost 50.28, Spencer Creek at Milepost 171.07, and Lost River at Milepost 212.07.

Figure 10 shows the potential for the loss of effective shade from the permanent right-of-way as the pipeline parallels Spencer Creek near Milepost 177. DEQ listed Spencer Creek as impaired for temperature. JCEP informed DEQ that the riparian impacts from FERC's 15-feet buffer requirement, noted above, were not included in the 2017 Thermal Impact Assessment. DEQ requested that JCEP include these impacts in their assessment and provide a revised assessment.

Given the incomplete thermal impact assessment and the lack of thermal mitigation plan to restore effective shade DEQ is unable to determine that JCEP's operation of the pipeline will comply with Oregon's temperature standard.

6.6.3 DEQ Findings

Based upon the foregoing findings, DEQ determines that the proposed pipeline and associated work areas and roadways are likely to violate Oregon's water quality standard for temperature, particularly in areas that are not currently meeting numeric standards. JCEP has adequately identified methods to avoid or mitigate these impacts, particularly by providing for mitigation in the watersheds where the impacts will occur. DEQ concludes that it does not have a reasonable assurance that the proposed activities will be conducted in a manner that will not violate the temperature water quality standards at OAR 340-41-0028 and TMDLs adopted to meet those standards.

6.7 Total Dissolved Gas

6.7.1 Applicable Standard

Oregon Administrative Rule 340-041-0031:

> *(1) Waters would be free from dissolved gases, such as carbon dioxide hydrogen sulfide, or other gases, in sufficient quantities to cause objectionable odors or to be deleterious to fish or other aquatic life, navigation, recreation, or other reasonable uses made of such water.*

[86] Oregon Administrative Rule OAR 340-041-0002(49)

[87] Oregon Administrative Rule OAR 340-041-0028(12)(a)

(2) Except when stream flow exceeds the ten-year, seven-day average flood, the concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection may not exceed 110 percent of saturation. However, in hatchery-receiving waters and other waters of less than two feet in depth, the concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection may not exceed 105 percent of saturation.

6.7.2 DEQ Evaluation: Total Dissolved Gas

Water discharged to a receiving waterbody may entrain ambient atmospheric gases causing the concentration of dissolved gases to increase. Certain hydraulic conditions (e.g., deep laminar flow reaches or glides) prevent equilibration and can cause total dissolved gases concentrations to increase above levels deemed safe for aquatic life.

JCEP does not propose actions that may increase the concentration of total dissolved gas in Project waterways.

6.7.3 DEQ Findings

DEQ is reasonably assured the JCEP's specified proposed actions considered in this focused Evaluations and Findings Report would not violate the Total Dissolved Gas water quality standard.

6.8 Toxic Substances

6.8.1 Applicable Standard

Oregon Administrative Rule 340-041-0033:

(1) Toxic Substances Narrative. Toxic substances may not be introduced above natural background levels in waters of the state in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare or aquatic life, wildlife or other designated beneficial uses.

(2) Aquatic Life Numeric Criteria. Levels of toxic substances in waters of the state may not exceed the applicable aquatic life criteria as defined in Table 30 under OAR 340-041-8033.

(2) Human Health Numeric Criteria. The criteria for waters of the state listed in Table 40 under OAR 340-041-8033 are established to protect Oregonians from potential adverse health effects associated with long-term exposure to toxic substances associated with consumption of fish, shellfish and water.

6.8.1 DEQ Evaluation: Toxic Substances

6.8.2.1 Pipeline construction

Hazardous substances are known to exist at certain locations along the route of the proposed pipeline. These substances include high concentrations of naturally occurring minerals such as arsenic and mercury, post-process wastes from former mercury mining operations, and chemical contaminants from spills at current and former industrial sites. These substances may be present at concentrations that exceed applicable human health and/or aquatic life numeric criteria. DEQ evaluates the effects of ground-disturbing activities on toxic substances in the sections below.

Naturally Occurring Mineralization

A study in 2009 investigated naturally occurring mercury mineralization between MP 109 and the East Fork Cow Creek.[88] Local geology includes mercury mineralization at concentrations sufficient to support commercial mining

[88] Potential for natural-occurring mercury mineralization to enter the aquatic environment between M.P. 109 and East Fork

operations in the early to mid-1900s. [89] The study confirmed "very low concentrations of mercury mineralization" near the proposed pipeline route. The study also identified two intermittent streams that cross the final pipeline alignment. These studies noted that the streams "lack connectivity to the main stem East Fork Cow Creek. However, JCEP did not provide the methodology to evaluate hydrologic connectivity. Finally, the study concludes that JCEP may minimize the discharge of sediments containing mercury mineralization by implementing procedures in the Erosion Control and Revegetation Plan. In Sections 6.1.2.1, 6.1.2.3, and 6.1.2.4 of this report, DEQ identifies necessary information absent from in the JCEP's erosion control and landslide mitigation analysis and practices in both JCEP's Erosion Control and Revegetation Plan and its Transportation Management Plan. JCEP also proposes to use the Transportation Management Plan to control sediment discharge during road use and construction. DEQ summarizes the deficiencies in JCEP's proposed Transportation Management Plan in Section 6.1.2.3.

Metals

In response DEQ's March 2010 information request, JCEP provided information on the effects of Project-related activities on certain contaminants including turbidity, nutrients, and metals.[90] In particular, the study found the increase of suspended mercury due to expected sediment loading (0.017 ng/l) is far lower than the Human Health Numeric Criteria of 144 ng/l.

Existing Solid and Hazardous Waste Sites

The Draft Environmental Impact Statement (FERC, 2019) identified 116 sites with documented existing or historical soil and/or groundwater contamination within 0.25 mile of the pipeline route. The Draft Environmental Impact Statement further directs JCEP, before close of the public comment period, to consult with DEQ "regarding existing soil and groundwater contamination at the sites listed in appendix G. The DEIS further directs JCEP to file the results of this consultation along with any proposed site-specific soil or groundwater handling, management, and disposal procedures. DEQ anticipates JCEP would submit additional requested information to allow DEQ to evaluate the effects of pipeline construction.

6.8.2.2 Waterbody Crossings

Trenched crossings across waterbodies can increase the mobilization, solubility, and availability of soil contaminants. As discussed above, sources of soil contaminants include naturally occurring minerals, legacy wastes from mining operations, and chemical contaminants from industrial operations.

On March 11, 2019, DEQ requested JCEP develop site-specific water body crossing and restoration plans for each waterbody affected by the pipeline. The plans are necessary to address methods needed to restore hydrologic and habitat function to predevelopment conditions. At locations where toxic or hazardous substances may be present, DEQ would rely on these plans to determine that construction and site restoration is completed in a manner that prevents the mobilization of soil contaminants.

DEQ has not yet received the waterbody crossing plans from JCEP. Absent such plans, DEQ cannot conclude that project actions avoid or minimize activities that discharge toxic substances into waters of the state.

6.8.2.3 Road construction and Maintenance

DEQ recognizes that stormwater runoff from road surfaces represents a significant source of potential pollutants, including toxic substances present in soils. Referring to our evaluation in Section 6.1.2.3, additional information is

Cow Creek. Larry Broeker, November 18, 2009 (Revised February 3, 2010).

[89] Potential for natural-occurring mercury mineralization to enter the aquatic environment between M.P. 109 and East Fork Cow Creek. Larry Broeker, November 18, 2009 (Revised February 3, 2010).

[90] Turbidy Nutrients Metals Water Quality Impacts Analysis, GeoEngineers August 29, 2017.

needed to evaluate potential risks presented by potentially toxic substances. Absent such plans, DEQ cannot conclude that measures to prevent or minimize the discharge of toxic substances to waters of the state during road construction and maintenance would not cause an exceedance to the toxic substances water quality standard.

6.8.2.4 Pipeline Right-of-Way

JCEP would maintain portions of the permanent right-of-way in an herbaceous state to facilitate access for pipeline maintenance and inspection. Methods to control vegetation are described in the Erosion Control and Revegetation Plan and include the application of herbicides and pesticides. The plan references procedures in FERC's Waterbody and Wetland Construction and Mitigation Procedures that prohibit chemical applications within 100 feet of wetlands or waterbodies except as allowed by federal or state authorities.

To comply with the Toxic Substances water quality standard, applicants must comply with state regulations regarding the application of chemical herbicides and pesticides at locations that may directly or indirectly affect waters of the state.

6.8.2.5 Terminal and Off-Site Area Stormwater

Jordan Cove's LNG terminal would create that would cause stormwater discharging to Coos Bay, groundwater fed wetlands, and the Pacific Ocean.

In Section 5.5.2.1 of the revised Terminal Storm Water Management Plan (March 2019), Jordan Cove proposes three categories of spill containment. In each category, Jordan Cove provides qualitative information on proposed controls. In addition, in its April 1, 2019 response to DEQ's September 25, 2018 information request, Jordan Cove directed DEQ to its proposed Spill Prevention, Control, and Countermeasure Plan for spill containment controls for the Terminal Storm Water Management Plan.[91] The cover of Jordan Cove's SPCC Plan contains a note that this plan is a preliminary version. DEQ reviewed this plan and determined that it is not a complete or final plan. For example, in Table 1-1 of the SPCC Plan, the list of bulk storage containers and their secondary containment system is incomplete. Jordan Cove does not provide information on the secondary containment for transformers. Jordan Cove also notes that other oil storage systems and their containment controls are to be determined in the future. Additionally, Section 8 of this plan is preliminary information and Jordan Cove notes that it would update this plan to reflect as-built controls.

In the final SPCC Plan, DEQ is seeking information on where exactly Jordan Cove would locate on its stormwater site plan the proposed loading aprons, lined earthen berms, double walled tanks, and other containment structures designed to contain spills as well as information on the specific design features of these controls. For reasonable assurance, DEQ needs to know if Jordan Cove would size the containment berms coupled with the containment capacity of the oil/water to capture the largest anticipated spill. Statements in the current draft SPCC Plan that Jordan Cove would comply with federal regulations are not a demonstration that Jordan Cove's proposed control concepts have the capacity to prevent a discharge to surface water. Site-specific design information on all proposed structural spill controls is essential for DEQ to evaluate their potential to control discharges to surface water. This detailed information meets DEQ's need for reasonable assurance that Jordan Cove's containment controls would achieve the toxic substances standard by selecting and designing the highest and best practicable controls to prevent the release of toxic substances to the Pacific Ocean. This design information is missing in the SPCC Plan and the revised Terminal Stormwater Management Plan.

6.8.2 DEQ Findings

1. DEQ expects JCEP would consult with DEQ and provide additional information as directed by FERC to identify potential hazardous waste and cleanup sites within the project area. Absent this information,

[91] Spill Prevention, Control, and Countermeasure Plan – Operation. August 29, 2017. Part 1: Appendix K, Section 401 Water Quality Package

violations of toxicity water quality standards are likely, and wouldDEQ concludes there is no reasonable assurance that the proposed activities would be conducted in a manner that would not violate the Toxic Substances water quality standard. OAR 340-041-0033, OAR 340-048-0020(3).

2. JCEP proposes a stormwater management plan that does not demonstrate the spill containment controls are designed, for example, to capture a spill from the largest storage vessel in a drainage area.
   a. Without this demonstration, DEQ does not have reasonable assurance that Jordan Cove designed and located spill containment controls in manner to prevent a spill from causing a violation of the toxic substance standard. OAR 340-041-003.

6.9 Turbidity

6.9.1 Applicable Standard

Oregon Administrative Rule 340-041-0036

Oregon Administrative Rule 340-041-0036 provides, in pertinent part, that " No more than a ten percent cumulative increase in natural stream turbidities may be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied * * *."

For activities authorized under a Clean Water Act Section 401 Water Quality Certification, CWA Section 404 Permit, and emergency activities coordinated with the Oregon Department of Fish and Wildlife, this standard may allow limited duration exceedances of the standard for dredging and construction activities. However, as set forth above, for a temporary exceedance, the project proponent must apply all practicable turbidity control techniques.

6.9.2 DEQ Evaluation: Turbidity

6.9.2.1 Pipeline construction

The information JCEP provided to DEQ does not demonstrate that pipeline construction and use of the construction access roads would avoid exceedances of the turbidity standard. DEQ refers the reader to Section 6.1.2.1 of this Report for DEQ's evaluation of JCEP's proposal to develop a construction right-of-way and a construction access road to install approximately 229 miles of pipeline. The evaluation in Section 6.1.2.1 is also relevant to DEQ's evaluation of JCEP's compliance with Oregon's turbidity standard while developing the construction right-of-way and the construction access road within it. DEQ briefly summarizes this evaluation below.

In Section 6.1.2.1, DEQ summarizes JCEP's proposal to grade and construct 229 miles construction access road to build the pipeline in the construction ROW. DEQ describes how this action would discharge sediment in stormwater without appropriate BMPs. DEQ evaluates JCEP's proposed erosion control BMPs for the construction ROW and the construction access road. DEQ highlights the lack of modeling in JCEP's submittal to evaluate the efficacy of its proposed BMPs for the construction ROW and its access road. DEQ considers the numerous landslide susceptibility zones in close proximity the ROW and, in many locations, beneath the fill of the ROW and the construction access road. DEQ notes the lack of engineering designs with support for construction ROW above and potentially discharging stormwater. Moreover, DEQ evaluates JCEP's methodology to identify landslide susceptibility zones and its criteria for addressing these zones during pipeline construction and operation. Finally, DEQ evaluates JCEP's BMPs to avoid pipeline construction initiating landslides.

In its December 20, 2018 supplemental information request, DEQ documents scientific literature concerning JCEP's proposed actions that can initiate a landslide (see Page 12 - 18 of Attachment A). In this supplemental request, DEQ also reviews JCEP's proposed BMPs relative to the information presented in literature to avoid

landslides initiated by linear infrastructure projects (see Page 71 – 77 of Attachment A). Human-caused debris torrents impact water quality by changing the natural cycles of sediment delivery to streams, which increases turbidity and this impacts the aquatic environment; thus, affecting aquatic life (Castro and Reckendorf 1995).

Given the following, JCEP has not demonstrated that pipeline construction and the use of the construction access road would avoid exceedances of the turbidity standard for the following reasons:

- Lack of technical support for erosion controls on unstable slopes.
- Lack of modeling demonstrating proposed erosion controls are the most effective.
- A landslide hazard assessment that does not follow state-of-practice protocols.
- A landslide hazard assessment that does not evaluate construction induced landslide hazards.
- Lack of engineering design and their support for mitigating landslide risk during pipeline construction.
- Lack of engineering designs for stormwater management above unstable slopes.

6.9.2.2 Waterbody Crossings

JCEP proposes pipeline installation using dry open-cut techniques at many minor waterbody crossings. This technique relies on temporary dams to isolate the work area thereby allowing the use of standard overland construction techniques to complete the waterbody crossing. JCEP provided general techniques and best management practices in their reports on dry open-cut waterbody crossings. The plans state, "For the first 10 to 30 minutes, turbidity downstream of the crossing area could increase considerably."[92]

Oregon's Turbidity water quality standard authorizes turbidity to increase more than ten percent above background levels *provided* all practicable turbidity control techniques have been applied. On March 11, 2019, DEQ requested JCEP to develop specific crossing plans for each waterbody crossed by the pipeline. DEQ would utilize this information to determine whether all practicable turbidity control techniques are employed to reduce Project-effects on turbidity. Because DEQ has not received the requested plans, DEQ cannot determine that pipeline installation would comply with the turbidity standard.

6.9.2.3 Road construction and Maintenance

The information JCEP provided to DEQ does not demonstrate that existing access road use and new road construction would avoid exceedances of the turbidity standard. The information provided for road improvements at stream crossings does not demonstrate that JCEP would apply all practicable turbidity controls during potential limited duration exceedances of the turbidity standard. DEQ refers the reader to Section 6.1.2.3 of this Report for DEQ's evaluation of JCEP's proposed use of existing access roads for pipeline construction. The evaluation in Section 6.9.2.1 is also relevant to DEQ's evaluation of JCEP's compliance with Oregon's turbidity while using existing access roads. DEQ briefly summarizes the evaluation in Section 6.1.2.3 here.

In Section 6.1.2.3, DEQ describes how JCEP's use of existing access roads can cause sediment and turbid discharges to streams. DEQ also describes the lack of clear BMPs that JCEP would use to maintain and, if needed, improve these roads to prevent sediment discharge to streams during pipeline construction. In addition, DEQ evaluates the Erosion Control and Revegetation Plan and Transportation Management Plan that JCEP proposed to control sediment discharge from roads. DEQ also evaluates JCEP's actions to conduct an inventory of unpaved existing access roads to develop a DEQ-requested maintenance and improvement for these roads. Finally, DEQ provides examples of proposed new roads where JCEP did not provide design information to demonstrate the cut and fills on these roads would prevent landslides from discharging to streams

[92] Stream Fluming Procedures, September 2017.

In its December 20, 2018 supplemental information request, DEQ summarizes the scientific literature and technical resources concerning the importance of non-paved road design to protect water quality for aquatic life (see Page 18 - 19, Attachment A). In this supplemental request, DEQ stresses to JCEP that the National Marine Fisheries Service identified routine road maintenance as a needed action to assist in the recovery of salmonids listed under the Endangered Species Act (see Page 18 of Attachment A). Castro and Reckendorf (1995) summarize the impact of sediment and turbid discharges in aquatic environments and its effect on aquatic life.

JCEP has not demonstrated that existing access road use and construction would avoid exceedances of the turbidity standard for the following reasons:

- Lack of a comprehensive inventory of unpaved roads hydrologically connected to streams.
- Lack of a comprehensive and complete maintenance and improvement plan for unpaved roads hydrologically connected to streams.
- A landslide hazard assessment that does not follow state-of-practice protocols.
- A landslide hazard assessment that does not evaluate construction induced landslide hazards.
- Lack of engineering designs with specifications demonstrating effective turbidity controls and landslide prevention measures for road construction.

6.9.2.4 Pipeline Right-of-Way

The information JCEP provided to DEQ does not demonstrate that pipeline operation would avoid violations of the turbidity standard. DEQ refers the reader to Section 6.1.2.4 of this Report for DEQ's evaluation of JCEP's proposal to maintain a permanent right-of-way (ROW) to operate the pipeline. The evaluation in Section 6.1.2.4 is also relevant to DEQ's evaluation of JCEP's compliance with Oregon's biocriteria while operating a permanent ROW. DEQ briefly summarizes the evaluation in Section 6.1.2.4 below.

In Section 6.1.2.4, DEQ evaluates the function of a permanent slope breaker (i.e., water bar) and describes how this stormwater collection system concentrates stormwater discharge along the permanent ROW. DEQ details the initial and final drainage area for permanent slope breakers on steep slopes. In addition, DEQ notes the potential for JCEP to discharge post-construction stormwater from the permanent ROW to landslide susceptibility zones. DEQ points out that JCEP did not provide DEQ with a post-construction stormwater management plan following DEQ's 2018 guidelines for post-construction stormwater plan submissions which request project proponents consider steep and landslide risks when siting discharge points.

In the evaluation in Section 6.1.2.4, DEQ evaluates the permanent slope breakers closest to pipeline stream crossings and their potential to discharge sediment and other pollutants to streams. DEQ explains how the permanent ROW is functioning as primitive road due soil compaction in the ROW during pipeline construction and during post-construction maintenance. Based on the information in JCEP's submittal, DEQ's demonstrates that the permanent ROW may discharge sediment streams at a rate equivalent to a gravel road with ruts. Moreover, DEQ notes that the area between the stream and permanent slope breaker upslope from the stream is a source of sediment delivery to streams. Given these sources of discharge, DEQ's requested that JCEP perform modeling; however, JCEP has not completed modeling and an engineering analysis of these discharges.

In its December 20, 2018 supplemental information request (see Pages 66 - 68, Attachment A), DEQ's evaluation provides the rationale for its request for modeling and engineering analysis for the permanent ROW stormwater discharges to stream described above. This rationale is also emphasized in the evaluation presented in Section 6.4.2.3. This evaluation documents the potential sources of sediment and turbid discharges that can contribute to or cause a violation of Oregon's turbidity standard.

JCEP has not demonstrated that pipeline operation would avoid violations of the turbidity standard for the following reasons:

- Lack of an engineering analysis and modeling for the right-of-way discharge at stream crossings.
- Lack of engineering designs and analysis for stormwater management above unstable slopes.
- Lack of post-construction stormwater management plan following DEQ guidelines.

6.9.2.5 Terminal and Off-Site Project Area Stormwater

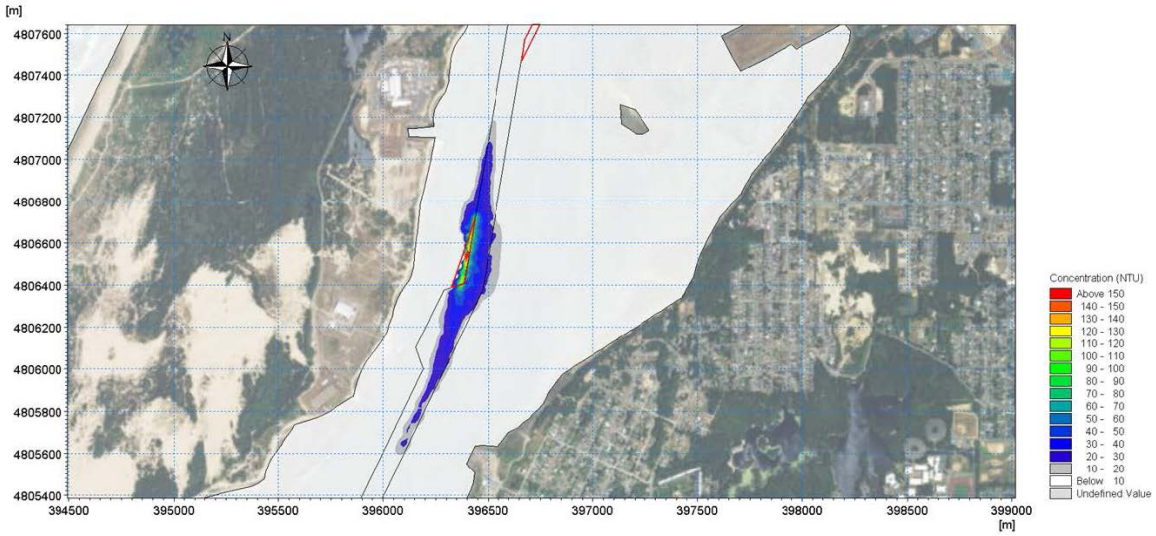
Section 6.1.2.5 of this report provides an evaluation of Jordan Cove's proposed actions to manage stormwater in the construction and operation of the Terminal and Off-site Areas. DEQ refers the reader to Section 6.1.2.5 for DEQ's evaluation of these proposed actions. The evaluation in Section 6.1.2.5 is also relevant to DEQ's evaluation of Pacific Connector's compliance with Oregon's turbidity standard while managing construction stormwater in the Terminal and Off-Site Project areas, managing stormwater and decant from dredge material disposal sites, and managing post-construction stormwater during the operation of the Terminal.

6.9.2.6 Dredging

Development of the proposed Slip and Access Channel would require the excavation and dredging of approximately 5.70 million cubic yards (mcy) of material. JCEP developed a Dredge Material Management Plan to guide dredging operations.[93] The DMMP describes three potential dredging methodologies, clamshell, hydraulic cutter-head, hydraulic hopper dredging, but acknowledges that the final dredging methods would depend on the equipment availability and the contractors' individual experience.

In addition, JCEP modeled the effects of turbidity at each of the proposed dredging locations using clamshell, hydraulic suction dredging, and excavation methods.[94] The modeling confirmed turbidity exceeding 10 NTU above background levels extending a total of more than one mile above and below the Navigational Reliability Improvement dredge locations. The modeling also confirmed elevated but comparatively localized turbidity plumes at the Slip, Access Channel, and eelgrass mitigation dredge locations. The report recommends that both capital and maintenance dredging operations incorporate construction BMPs, although the "nature and extent of BMPs should be determined through coordination with the regulatory agencies".

Figure 17: Modeled Turbidity from Capital and Maintenance Dredging at NRI-3



Oregon's Turbidity water quality standard allows DEQ to issue Section 401 water quality certifications that

[93] Dredge Material Management Plan. David Evans & Associates, Inc. October 2017.
[94] Hydrodynamic Studies – Turbidity Analysis, Moffat and Nichol, November 2017.

authorize actions to exceed numeric turbidity limits provided the applicant employ all practicable turbidity control techniques. On September 7, 2018, DEQ requested additional information related to JCEP's proposed dredging methods and measures to avoid or minimize turbidity. Specifically, DEQ requested a Dredging Pollution Control Plan. In particular, the request was for a "description of water pollution controls (operational controls, structural such as floating turbidity curtain etc.) that JCEP would use in dredging and transporting dredged material".

JCEP has not submitted a Dredging Pollution Prevention Plan. DEQ finds JCEP's proposed activities would cause turbidity to increase in excess of numeric limits, and absent any Dredging Pollution Prevention Plan, JCEP has failed to demonstrate its methods include sufficient controls to prevent exceedance of turbidity standard in OAR 340-041-0036.

6.9.3 DEQ Findings: Turbidity

DEQ's preceding evaluation of Project results in the following findings related to OAR 340-041-0036:

1. JCEP's proposed activities do not employ the highest and best treatment to control turbid discharges by failing to:
    a. Demonstrate the deployment of effective BMPs during pipeline construction and operation.
    b. Demonstrate the use of effective BMPs during road maintenance.
    c. Provide a site-specific waterbody crossing and restoration plans to minimize turbid discharges and restore stream form and function supporting water quality.
2. JCEP's proposed activities do not employ methods to construct and maintain roads in a manner to prevent turbid discharges to public waters by minimizing erosion of cut bank, fills, and roads.
3. JCEP's proposed activities do not employ methods to control turbid discharges generated by organic or inorganic debris from landslides during pipeline construction, pipeline operation, waterbody construction planning, and road maintenance, and road construction.
4. JCEP has not provided site-specific waterbody crossing and restoration plans that sufficiently describe required methods to avoid, minimize, and mitigate for turbidity. DEQ relies on the plans and information described above to confirm the project has considered the highest and best treatment techniques for minimizing turbidity during construction activities. Absent these plans and information, DEQ does not have a reasonable assurance that the JCEP's proposed activities will comply with the turbidity water quality standard. OAR 340-048-0020(3).
5. JCEP's proposed activity would likely violate the Turbidity water quality standard for the following reasons:
    a. JCEP has not provide an NDPDES 1200-C required Erosion and Sediment Control Plan demonstrating sediment and erosion controls with installation techniques have been properly deployed during the construction of the Terminal and Off-Site Project Areas to control turbidity from construction activities.
    b. JCEP proposes the disposal of dredged material producing turbid discharges from the leachate (i.e., decant flows), from this disposed material, and from exposed soils without demonstrating the deployment of site-specific controls to prevent exceedance of turbidity standard in OAR 340-041-0036.
6. JCEP's modeling conducted confirms that dredging at the Navigational Reliability Improvement locations, the Slip, and Access Channel would cause turbidity levels to increase above allowable numeric limits.
7. JCEP did not provide a Dredging Pollution Prevention Plan that sufficiently demonstrates JCEP considered and proposed all practicable turbidity control techniques to avoid, minimize, and mitigate these effects as required by OAR 340-041-0036.

Based upon these findings, violations of the turbidity water quality standard are likely to occur and DEQ concludes that it lacks a reasonable assurance that the proposed activities will be conducted in a manner that will not violate the Turbidity water quality standard.

6.10 Antidegradation

Oregon water quality standards have three main elements: beneficial uses; numeric and narrative criteria designed to protect those uses; and an antidegradation policy that is design to assure that water quality continues to improve. When the Department considers issuing a permit or a water quality certificate that would allow the existing water quality to be diminished in some way, the Department action must comply with the antidegradation provisions of the water quality standards.

6.10.1 Applicable Standard

Oregon's antidegradation policy provides a process to protect, maintain, and enhance water quality, support beneficial uses, and guide decision-making to prevent further degradation from new or increased point and nonpoint pollution sources. The antidegradation policy supplements other provisions of DEQ's water quality rules and is further implemented through guidance provided in Oregon's Antidegradation Internal Management Directive.

Oregon's antidegradation policy recommends a complete antidegradation review for new discharge sources requiring a Section 401 water quality certification. DEQ has established antidegradation review procedures for waterbodies classified as Outstanding Resource Waters, High Quality Waters, and Water Quality Limited Waters. The policy establishes a process in which DEQ may authorize actions that lower water quality in High Quality and Water Quality Limited Waters providing the action does not violate water quality standards, the action maintains support for beneficial uses, and feasible alternatives were implemented to reduce water quality impacts. If no feasible alternatives exist, the antidegradation policy may consider whether the action's social and economic benefits outweigh the environmental costs of reduced water quality.

The proposed Project does not affect any waterbodies classified as Outstanding Resource Waters.
Oregon Administrative Rule OAR 340-041-0004:

(1) Purpose. The purpose of the Antidegradation Policy is to guide decisions that affect water quality to prevent unnecessary further degradation from new or increased point and nonpoint sources of pollution, and to protect, maintain, and enhance existing surface water quality to ensure the full protection of all existing beneficial uses. The standards and policies set forth in OAR 340-041-0007 through 340-041-0350 supplement the Antidegradation Policy. * * *

(3) Nondegradation Discharges. The following new or increased discharges are subject to this division. However, because they are not considered degradation of water quality, they are not required to undergo an antidegradation review under this rule:

* * *

(c) Temperature. Insignificant temperature increases authorized under OAR 340-041-0028(11) and (12) are not considered a reduction in water quality.

(d) Dissolved Oxygen. Up to a 0.1 mg/l decrease in dissolved oxygen from the upstream end of a stream reach to the downstream end of the reach is not considered a reduction in water quality so long as it has no adverse effects on threatened and endangered species. * * *

(6) High Quality Waters Policy: Where the existing water quality meets or exceeds those levels necessary to support fish, shellfish, and wildlife propagation, recreation in and on the water, and other designated beneficial uses, that level of water quality must be maintained and protected. However, the commission, after full satisfaction of the intergovernmental coordination and public participation provisions of the continuing planning process, and with full consideration of sections (2) and (9) of this rule, and 340-041-0007(4), may allow a lowering of water quality in these high quality waters if it finds:

(a) No other reasonable alternatives exist except to lower water quality; and

(b) The action is necessary and benefits of the lowered water quality outweigh the environmental costs of the reduced water quality. This evaluation will be conducted in accordance with DEQ's "Antidegradation Policy Implementation Internal

Management Directive for NPDES Permits and section 401 water quality certifications," pages 27, and 33-39 (March 2001) incorporated herein by reference;

(c) All water quality standards will be met and beneficial uses protected; and

(d) Federal threatened and endangered aquatic species will not be adversely affected.

(7) Water Quality Limited Waters Policy: Water quality limited waters may not be further degraded except in accordance with paragraphs (9)(a)(B), (C) and (D) of this rule.

(8) Outstanding Resource Waters Policy. Where existing high quality waters constitute an outstanding State or national resource such as those waters designated as extraordinary resource waters, or as critical habitat areas, the existing water quality and water quality values must be maintained and protected, and classified as "Outstanding Resource Waters of Oregon." * * *

6.10.2 DEQ Evaluation

The preceding sections of this Evaluation and Findings report conclude that proposed activity would affect certain water quality standards and result in a lowering of water quality. Oregon's antidegradation policy requires DEQ to undertake a review of these actions in accordance with procedures established in the Antidegradation Internal Management Directive. The construction and operation of the Pacific Connector Pipeline would not meet the minimum requirements of Oregon's antidegradation policy because the applicant has not fully considered feasible alternatives to avoid, minimize, or mitigate for impacts to waters of the state. Absent an evaluation of feasible alternatives DEQ is prevented from considering the economic and social benefits of the proposed action against the environmental impacts of lowered water quality.

Temperature

Section 6.6 of this Evaluation and Findings Report finds that the temporary and permanent pipeline right-of-way would increase thermal impacts to waterbodies. JCEP has not provided a Source Specific Implementation Plan to propose methods to mitigate these impacts. Absent such a plan, DEQ finds the project does not meet the Antidegradation policy by failing to consider and implement alternative methods.

Turbidity and Sedimentation

Sections 6.1 and 6.9 of this Evaluation and Findings Report finds the proposed project would increase sedimentation and turbidity. JCEP has not submitted plans to address mitigation of project-related effects for road construction and maintenance, waterbody crossings, pipeline construction, and right-of-way maintenance. Information in plans is necessary to demonstrate JCEP proposed methods that would result in the least impact to water quality. Absent plans that support this requirement, DEQ finds the project does not meet the antidegradation policy by failing to consider and implement alternative methods.

Biocriteria

Section 6.2 of this Evaluation and Findings Report finds that trenched waterbody crossings would affect aquatic and riparian habitat and may cause detrimental changes to resident biological communities. JCEP has not submitted specific waterbody crossing and restoration plans for each proposed crossing. DEQ finds the project does not meet the Antidegradation policy's requirements by failing to demonstrate that alternative methods were considered.

6.10.3 DEQ Findings

DEQ's antidegradation policy requires a complete antidegradation review for projects subject to section 401 water quality evaluation. OAR 340-041-0004. Upon completion of such a review, DEQ may authorize projects that result in reduced water quality providing certain conditions are demonstrated. As discussed more fully in preceding

sections, JCEP failed to provide information necessary to complete such a review. Absent plans that demonstrate JCEP considered methods to avoid and minimize water quality impacts to temperature, turbidity, sedimentation, and biocriteria, DEQ finds the project does not meet the requirements of DEQ's antidegradation policy.

Based on the preceding evaluation, DEQ finds the proposed Project does not comply with Oregon's antidegradation policy.

7 Evaluation of Compliance with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act

To certify a project pursuant to Section 401 of the federal Clean Water Act, DEQ must find that the project complies with applicable provisions of Sections 301, 302, 303, 306 and 307 of the Act and state laws and regulations adopted to implement these sections. Sections 301, 302, 306 and 307 of the federal Clean Water Act deal with effluent limitations, water quality related effluent limitations, national standards of performance for new sources and toxic and pretreatment standards. All of these requirements relate to point source discharges and are the foundation for conditions in National Pollutant Discharge Elimination System permits issued to the point sources.
Section 303 of the Clean Water Act relates to Water Quality Standards and Implementation Plans. EPA has adopted regulations to implement Section 303 of the act. The Environmental Quality Commission adopted water quality standards consistent with the requirements of Section 303 and the applicable EPA rules. The commission standards are in Oregon Administrative Rules Chapter 340, Division 41. EPA has approved the Oregon standards pursuant to the requirements of Section 303 of the act and has approved TMDLs that implement those standards in basins where standards are not currently being met. For the reasons set forth in the preceding sections of this report, DEQ finds that the proposed Project would not comply with Oregon Water Quality Standards and, in certain aspects, applicable TMDLs.

8.0 Evaluation Of Other Appropriate Requirements Of State Law

Pursuant to § 401(d) of the Clean Water Act, DEQ may condition a water quality certification to assure compliance with other appropriate requirements of state law. Such requirements are "appropriate" if they have any relation to water quality, Arnold Irrigation Dist. v. DEQ, 79 Or.App. 136 (1986), PUD No.1 of Jefferson Co. v. Washington Dept. of Ecology, 511 U.S. 700 (1994). Because DEQ is denying the requested water quality certification for the proposed Project for the reasons stated above in this report, DEQ has not fully evaluated what conditions would be necessary to comply with other appropriate requirements of Oregon law. However, DEQ lists below the requirements that it would consider should JCEP make a new request for certification.

Department of Land Conservation and Development

While the denial of certification may not be based on land use considerations, land use regulations protecting water quality and aquatic resources must be considered by DEQ. DEQ has determined that JCEP has not provided an adequate land use exhibit, as required by OAR 340-048-0020(i). This section of this report provides background for this determination and provides information that may be helpful should the application be resubmitted.

General Land Use Requirements under ORS 197.180

Unlike most states, Oregon has a system of statewide laws governing land use. The system includes 19 rules designated as statewide goals. The goals encompass a range of issues relating to land use, land development, and environmental protection, including goals and rules directly relating to water quality and to estuaries. OAR chapter 660, division 15. Local governments have the primary responsibility for implementing these statewide rules. Under ORS 197.180, however, state agencies also must comply with the statewide planning goals and act in a manner that is compatible with local comprehensive plans and land use regulations when taking actions in programs affecting land use.

A state agency generally complies with the statewide planning goals by acting compatibly with applicable comprehensive plans and local land regulations when such plans and regulations are acknowledged to comply with the statewide planning goals. OAR 660-030-0065(2); Schreiner's Gardens v. DEQ, 71 Or. App. 381(1984). Under the general rules adopted by the Land Conservation and Development Commission (LCDC) to implement ORS 197.180 and the specific rules governing DEQ, the agency may, and generally does, rely on determinations by local governments concerning whether a proposed use is compatible with acknowledged local plans and regulations. OAR 660-030-0070; OAR 340-018-0050. These determinations are known as "land use compatibility statements" or as a "LUCS". In situations where a local government cannot or does not provide a satisfactory LUCS, DEQ must determine for itself whether a proposed project or activity complies with the statewide goals, and is compatible with applicable acknowledged local plans and regulations.

Special Limitations Under CWA Section 401

The section 401 certification program is a program affecting land use for purposes of ORS 197.180. OAR 340-018-0030(4)(g). To the extent permitted by law, the DEQ certification decision must comply with the statewide planning goals and be consistent with acknowledged local land use plans and regulations as described above. Oregon case law, however, limits the application of ORS 197.180 in the context of certifications issued under CWA Section 401. Specifically, DEQ may apply applicable state and local land use regulations only to the extent that they relate to water quality, and then only for purposes of determining whether to impose conditions to assure compliance with those regulations (and not for purposes of approval or denial). Such provisions are "other appropriate requirement of State law" for purposes of CWA Section 401(d). Arnold Irrigation Dist. v. DEQ, 79 Or.App. 136 (1986).

Oregon's rule implementing the CWA, ORS 197.180 and the Arnold Irrigation Dist. decision requires:
(i) An exhibit that:
(A) Includes land use compatibility findings for the activity prepared by the local planning jurisdiction;
(B) If land use compatibility findings have not been obtained, identifies the specific provisions of the local land use plan and implementing regulations applicable to the activity and describes the relationship between the activity and each of the land use provisions identified in paragraph (A) of this subsection; and
(C) Discusses the potential direct and indirect relationship to water quality of each finding or land use provision.

OAR 340-048-0020.

On January 28, 2019, JCEP submitted to DEQ a land use exhibit pursuant to OAR 340-048-0020(2)(i). As discussed below, however, it is incomplete and otherwise inadequate to satisfy the rule.

JCEP has not supplied valid or complete LUCSs from the counties where the facility and pipeline would be located. Accordingly, before a certificate can issue, DEQ would be required to make its own determination regarding

whether the Project is compatible with water quality related requirements in the local comprehensive plans and land use regulations and complies with water quality related requirements in the statewide planning goals. (In the context of this application, DEQ has determined that elements of statewide Goals 5, 6, 12, and 16 (and their implementing regulations) are applicable.)

To the extent that a local government has applicable acknowledged local land use plans and regulations, and the Project components in the county would be compatible with those plans and regulations, DEQ generally would rely on the compatibility findings to determine goal compliance. To the extent a county does not have acknowledged plans and regulations addressing the project or DEQ cannot determined that the project is compatible with such provisions, DEQ would make its own finding regarding goal compliance and local compatibility. As noted above, however, in the context of Section 401 certifications, the findings would be limited to water quality related provisions. ORS 197.180(1)(b). The following subsections of this report describe DEQ's current evaluations of these issues.

Klamath County

Klamath County provided a LUCS dated January15, 2019, that covers both the proposed pipeline and compressor station. The LUCS states that both uses are compatible with the acknowledged comprehensive plan and allowed by conditional use permit. The County has issued a conditional use permit (CUP 5-15) for the proposed compressor station. The County has not issued a permit or approval from the pipeline, however, because it believes its authority to do so has been pre-empted by FERC. Although the LUCS acknowledges that approvals have not been issued for the pipeline, it incorporates proposed findings prepared by the JCEP for the LUCS previously issued in 2015 and a review of plan and regulation amendments that occurred after 2015. The proposed findings indicate that the pipeline would be approvable if the County were to exercise its land use jurisdiction.

Based on the County's findings and the supporting information provided by the JCEP to DEQ and the County, DEQ believes that the compressor station is compatible with the local acknowledge comprehensive plan and regulations and with the statewide goals. Based on the statements in the LUCS and proposed findings of the JCEP, DEQ has sufficient information at this time to determine the other elements of the Project within Klamath County are compatible with the County's comprehensive plan and land use regulations and would be approved or permitted if the County were to assert its land use jurisdiction. Because the pipeline use would be compatible with the County's acknowledged comprehensive plan and land use regulations, the Project elements in Klamath County could be deemed to comply with the statewide land use goals as well.

Jackson County

JCEP has provided an unsigned and undated LUCS from Jackson County. The LUCS states that the Project within Jackson County is allowed, but only because the Project is not subject to the County's comprehensive plan and land use regulations. The unsigned LUCS indicates that the County's refusal to assert jurisdiction arises from County policy number 17 relating to linear transmission facilities. The County does not take a position on whether the pipeline would be allowed outright or by conditional use permit if it were subject to the County's plan and land use regulations. JCEP provided proposed findings prepared in September 15, 2015, that purport to demonstrate that the Project would be compatible with the County's comprehensive plan and land use regulations if the County were to assert jurisdiction. JCEP has also provided evidence that there have been no relevant changes in the plan and land use regulations after 2015.

Without confirmation from the County that it concurs with the proposed findings, DEQ declines to determine at this time whether the pipeline is compatible with acknowledged comprehensive plan provisions and land use regulations for Jackson County. Some of the provisions in the comprehensive plan and land use regulations, including those relating to approval of conditional uses for linear facilities, appear to be water quality related. JCEP's land use exhibit, however, does not attempt to identify specifically which applicable plan provisions and implementing regulations are water quality related.

Douglas County, Non-Coastal Zone

JCEP provided a LUCS from Douglas County dated January 23, 2019, stating the pipeline use is allowed, but this is based on findings that County zoning authority over portions of the pipeline outside the coastal zone are pre-empted by the Natural Gas Act. JCEP has also provided proposed findings prepared in September 15, 2015, purporting to demonstrate that the project would be compatible with the County's comprehensive plan and land use regulations if the County were to assert jurisdiction.. JCEP has also supplied evidence that there have been no relevant changes to the plan and regulations after 2015. The LUCS acknowledges but does not incorporate or approve the proposed findings submitted by the JCEP.

Without confirmation from the County that it concurs with the proposed findings, DEQ declines to determine at this time whether the pipeline is compatible with acknowledged comprehensive plan provisions and land use regulations. Some in the plan and land use regulations, including those relating to approval of linear facilities, appear to be water quality related. JCEP's exhibit, however, does not attempt to identify specifically which applicable plan provisions and implementing regulations are water quality related.

Douglas County, Coastal Zone

The County provided a LUCS dated January 23, 2019, stating the pipeline use is allowed based on the prior issuance of conditional use permit and the findings supporting that permit. On this same day, however, the Douglas County Circuit Court determined that the conditional use permit issued by the County for construction of the pipeline on lands within the coastal zone is void based on the failure of the County to grant timely extension of the permit. McLaughlin et al. v. Douglas County, 17CV32687, 17CV41672 and 18CV04396. Under the provisions of OAR 340-018-0050(2)(a)(G), DEQ cannot base compatibility with acknowledge local plans and regulations and the applicable statewide planning goals on the basis of a LUCS that has been invalidated.

JCEP's land use exhibit is predicated on establishing compatibility with the comprehensive plan and land use regulations. Some of the provisions in the comprehensive plan and land use regulations, including those relating to approval of conditional uses for linear facilities, appear to be water quality related. JCEP's exhibit, however, does not attempt to identify specifically which applicable plan provisions and implementing regulations are water quality related.

The conditional use permit in question appears to be a requirement for the project under the regulations implementing the federal Coastal Zone Management Act. Consequently. DEQ anticipates that the JCEP would reapply for the CUP. If the permit is re-issued, DEQ would be able to determine the pipeline with in the Coastal Zone in Douglas County is compatible with the acknowledged plan and land use regulations.

Coos County

Coos County issued a LUCS dated December 17, 2018, that states the Project is not compatible with local comprehensive plan and land use regulations. This determination is based on several factors including necessary conditional use permits and plan amendments that have not yet been obtained for the pipeline and roadways, and the invalidation and remand of county decisions approving the LNG terminal itself. Ocean Shores Conservation Coalition v. Coos County, LUBA No. 2016-095 (2017). LUBA's decision was subsequently affirmed by the Oregon Court of Appeals.

With respect to the terminal, LUBA concluded that the County's findings were inadequate or improper. The remand involves, but is not limited to, the following water quality related issues:

- Findings relating to the need and substantial benefit required under Coos Bay Estuary Management Plan

policy 5(I) with respect to the dredging required in areas zoned 5-DA and 6-DA;
- Findings of no unreasonable interference with the public trust rights required under Coos Bay Estuary Management Plan policy 5(I) with respect to the dredging required in areas zoned 5-DA and 6-DA;
- Findings relating to whether the public need and gain from the project warrants the loss or modification to the estuarine system under Policy 4 and 4(a); and
- Mitigation findings with respect to its approval for filling a portion of the estuary in the 7-D zone.

Because key elements of the proposed Project are not currently allowed under the county's acknowledged comprehensive plan and land use regulations, DEQ cannot (at this time) determine that the Project is compatible with the acknowledged comprehensive plan and land use regulations. Some aspects of these decisions are clearly water quality related.

City of Coos Bay

As JCEP acknowledges, the Project requires a land use goal exception, comprehensive plan change, zoning map amendments, and a conditional use permit from the City of Coos Bay. These land use actions are needed at least in part to comply with water quality related requirements of the statewide land use goals as implemented through the city's comprehensive plan and land use regulations. As a result, DEQ cannot (at this time) determine that the Project is compatible with the acknowledge comprehensive plan and land use regulations.

City of North Bend

As JCEP acknowledges, conditional use permits from the City of North Bend are required in order for the Project to be compatible with the acknowledged comprehensive plan and land use regulations. These permits implement water quality related requirements of the statewide land use goals.

Laws Administered by the Oregon Department of State Lands
ORS 196.795 to 196.990 requires that permits be obtained from the Department of State Lands (DSL) prior to any fill or removal of material from the bed or banks of any stream.

Laws Administered by the Oregon Department of Fish and Wildlife
ORS 496.012 sets wildlife policy for prevention of depletion of indigenous species and toward wildlife resource decisions to be made in the best social, economical and recreational interests of all user groups

ORS 496.164 provides for cooperation and technical assistance to other agencies with regard to wildlife resource management

ORS 496.170 to 496.192 requires collection and analysis of scientific data to determine and inventory biological status of species, develop conservation strategies, and provide recommendations to other agencies regarding actions affecting threatened or endangered species

OAR 635-007-0502 et. seq. native fish conservation policy – protection of natural ecological communities and habitats tailored to individual watersheds and situations

OAR 635-059-0000 et. seq. aquatic invasive species control

OAR 635-100-0135 Survival Guidelines for Species Listed as Threatened or Endangered – lower Columbia coho

OAR 635-100-0150 requires consultation with ODFW on affects to endangered species OAR 635-410-0000 natural resource losses

OAR 635-412-0005 et. seq. addresses fish passage

OAR 635-413-0000 et. seq. fish habitat mitigation policy OAR 635-425-0000 et. seq. in-water blasting

OAR 635-500-0002 et. seq. addresses fish management plans

Laws Administered by the Oregon Department of Environmental Quality

ORS 459.005 – 418 Solid Waste Management Law

ORS 466.020, 075, 105, and 195 Hazardous Waste Management Law

ORS 468B.155 prevention of groundwater contamination

ORS 468B.160 (5) triggers action to prevent groundwater contamination or restore acceptable levels

OAR 340-040-0030 permitted operation (5) action requirements and (6) remedial action requirements

OAR 340-045 pertaining to NPDES and WPCF permits

OAR 340-143-0000 pertaining ballast water management

Laws Administered by the Oregon Department of Water Resources

OAR 690-009 groundwater interference with surface water OAR 690-010 appropriation and use of groundwater
OAR 690- 012 out-of-basin diversion OAR 690-020 dam safety

OAR 690-28 surface water registrations

OAR 690-033 standards for new appropriations

OAR 690-077 instream water rights
OAR 690-086 water management and conservation plans

Laws Administered by the Oregon Watershed Enhancement Board

ORS 541-351 et. seq. Oregon Plan for Salmon and Watersheds

9.0 Public Comment

The Corps' and DEQ's public comment period for the Project was originally from May 22, 2018 through July 21, 2018. The agencies extended the public comment period until August 20, 2018. DEQ received about 42,000 public comments electronically and by mail.

This document does not include responses to these public comments because DEQ is denying certification based, in part, upon the failure of the applicant to provide necessary information; therefore, a complete response to public comments has not been prepared.

10.0 Conclusion

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For the reasons set forth in this report, DEQ denies Jordan Cove's request for 401 WQC for the Project. DEQ does not have a reasonable assurance that the construction and operation of the Project will comply with applicable state water quality standards, as described in this report. DEQ's decision, however, is made without prejudice. Jordan Cove may reapply for a 401 WQC for the Project, and DEQ will consider additional information that is responsive to the bases for denial in this decision.

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Attachment A

Additional Information Requests

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Oregon
Kate Brown, Governor

Department of Environmental Quality
Western Region Eugene Office
165 East 7th Avenue, Suite 100
Eugene, OR 97401
(541) 686-7838
FAX (541) 686-7551
OTRS 1-800-735-2900

September 7, 2018

Derik Vowels
Jordan Cove LNG, LLC
Consultant, Lead Environmental Advisor
111 SW 5th Ave., Suite 1100,
Portland OR 97204

Re: Additional Information Request
Jordan Cove Energy Project (FERC Project No. CP17-494)
Pacific Connector Gas Pipeline (FERC Project No. CP17-495)
U.S. Army Corps of Engineers (Project No. NWP-2017-41)

Dear Mr. Vowels:

The Oregon Department of Environmental Quality (DEQ) is currently reviewing an application from Jordan Cove LNG, LLC (Jordan Cove) for Clean Water Act section 401 water quality certification for a Section 404 permit from the U.S. Army Corps of Engineers necessary for construction of the Jordan Cove Energy Project and Pacific Connector Gas Pipeline (collectively, "the Project"). Jordan Cove proposes to construct a liquefied natural gas export facility near North Bend, Oregon, and a 232-mile natural gas pipeline connecting the terminal with existing pipelines near Malin, Oregon.

Section 401 of the Clean Water Act bars federal agencies from issuing a license or permit for an action that may result in a discharge to Oregon waters without first obtaining water quality certification from DEQ. DEQ anticipates Jordan Cove's construction and operation of the Project will require authorizations from multiple federal agencies, including but not limited to a Section 404 permit from the U.S. Army Corps of Engineers and authorizations from the Federal Energy Regulatory Commission (FERC) pursuant to the Natural Gas Act. DEQ is conducting a comprehensive section 401evaluation of the Project's direct, indirect, and cumulative effects on water quality. DEQ currently expects to develop a single certification decision based on this comprehensive evaluation of the Project that will be applicable to both the Corps and FERC decisions on the Project.

DEQ is processing the applications pursuant to Section 401 of the Clean Water Act, 33 USC §1341, ORS 468B.035 through 468B.047, and DEQ's certification rules found in Oregon Administrative Rules 340, Division 048. To certify the Project, DEQ must have a

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reasonable assurance that the proposed Project, as conditioned, will comply with Sections 301, 302, 303, 306, and 307 of the Clean Water Act, Oregon water quality standards, and any other appropriate requirements of state law.

DEQ has conducted a preliminary review of the application package material submitted February 6, 2018, by David Evans and Associates, Inc. on behalf of Jordan Cove. The information described in the attachments to this correspondence is necessary to complete DEQ's analysis of the Project's compliance with applicable standards. Please file a complete response to this additional information request within 30 days of the date of this letter. Please forward your responses to:

Christopher Stine
Oregon Department of Environmental Quality
165 East 7th Avenue, Suite 100
Eugene, Oregon 97401

If Jordan Cove cannot provide certain information within the requested period, please indicate which items will be delayed and provide a projected filing date. You may reference previously submitted documents, in whole or in part, to support your responses to the requests in Attachments A through B

DEQ reserves the right to request additional information as necessary to complete its analysis and fulfill its obligations under state and federal law.

If you have any questions, please contact me directly at (541) 686-7810, or via email at stine.chris@deq.state.or.us.

Christopher Stine, PE
Water Quality Engineer

ec: Mike Koski, mkoski@pembina.com
Rose Haddon, rhaddon@pembina.com
Keith Andersen, Dave Belyea, Steve Mrazik, Chris Bayham, Mary Camarata, Sara Christensen/DEQ
Tyler Krug, Tyler.J.Krug@usace.army.mil
John Peconom, John.Peconom@ferc.gov
Sean Mole, sean.mole@oregon.gov

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ATTACHMENT A

Jordan Cove Energy Project / Pacific Connector Gas Pipeline
Additional Information Request

1. Application for Certification
   Oregon Administrative Rule (OAR) 340-048-0020(2) identifies the minimum requirements for applications to the Oregon Department of Environmental Quality for section 401 water quality certification. Please provide complete responses to the application requirements given in OAR 340-048-0020(2)(a-j). If Jordan Cove has previously submitted portions of this information, please reference the location and include any supplemental or clarifying information, as necessary, to provide complete responses.

2. Proposed Action
   Jordan Cove must provide and update DEQ with a complete and current description of the construction and operation of the proposed Project and the impacts of these actions on affected waterbodies. DEQ recognizes that Jordan Cove may revise project elements during the design process. Jordan Cove must provide DEQ with timely submissions describing changes to the proposed activity that may directly or indirectly affect water quality. Jordan Cove must also specify clearly that it is requesting that DEQ accept these submissions as changes to the proposed activity and consider the effects of the revised action in our section 401 water quality evaluation.

3. Submission of Application Information
   Jordan Cove's application to DEQ for section 401 water quality certification must provide DEQ with a comprehensive description of the proposed action including all resource reports, maps, electronic data files, and supporting documentation provided to federal agencies from whom Jordan Cove is seeking permits or authorizations. DEQ's certification rules require applicants to file information directly with the Department. For this reason, DEQ does not consider the availability of information on external websites or other sources as a submittal unless the applicant explicitly directs DEQ to obtain application materials from these sources.

4. Water Quality Standards
   Oregon's water quality standards consist of beneficial uses, numeric and narrative criteria developed to support these uses, and an antidegradation policy that prohibits an activity from further degrading water quality. Applicants for water quality certification must provide sufficient information to demonstrate the activity will comply with Oregon water quality standards (OAR 340-048-0020(g)).

   Provide information to demonstrate how the Project will comply with the water quality standards found in OAR 340 Division 041. For project activities that do not affect State waters, note how the Project will not violate applicable standards. For project activities that do impact State waters, note how Jordan Cove is proposing to mitigate, reduce, or prevent impacts so as to ensure the Project, as proposed, does not violate applicable water quality standards. Project impacts should be assessed in terms of direct, indirect, and cumulative effects of the activity on state water quality.

ATTACHMENT B

Jordan Cove Energy Project / Pacific Connector Gas Pipeline
Additional Information Request

Preliminary evaluation of the proposed activities to determine compliance with the requirements for a Certification Decision as described in Oregon Administrative Rules 340-048-0042(2):

Oregon Administrative Rule	Requirement	Information Requested
340-048-0042(2)	Compliance with Clean Water Act Sections 301 and 302	Please provide a NPDES 1200-C Permit Application demonstrating that land disturbing activities associated with the construction of Jordan Cove Energy Project's Liquefied Natural Gas Terminal as well as the following: • Land disturbing activities associated with the dry excavated portion of this terminal's Marine Slip, • Land disturbing activities associated with all offsite project areas associated with this terminal and its construction including those areas described in Section 5.3 of this terminal's stormwater management plan (Part 1, Attachment A3). • Land disturbing activities associated with roads used to access this terminal and offsite project areas. • Land disturbing activities associated with any other facilities (staging areas, refueling areas, employee parking etc.) that Jordan Cove Energy Project will use to construct of this terminal. DEQ will need to determine if these land disturbing activities will comply with the technology-based effluent limits of this permit. DEQ will also need an erosion and sediment control plan that, for example, addresses Schedule A.12.b.v and other conditions in this permit. For DEQ to evaluate the water quality impacts of the construction process on waters of the state, DEQ needs this information in an erosion and sediment control plan.
		Please provide a NPDES 1200-C Permit Application for land disturbing activities associated with the construction of Pacific Connector's gas pipeline and with the construction of all associated facilities such as communication towers, roads (existing and new), disposal sites, block valve facilities, and compressor stations. DEQ will need to determine if these land disturbing activities will comply with the technology-based effluent limits of this permit. DEQ will also need an erosion and sediment control plan that, for example, addresses Schedule A.12.b.v and other conditions in this permit. For DEQ to evaluate the water quality impacts of the construction process on waters of the state, DEQ needs this information in an erosion and sediment control plan.
		Please provide a NPDES 1200-A Permit Application demonstrating that the proposed 20 sites to obtain rock for Pacific Connector's gas pipeline construction and maintenance. DEQ will need to determine if these land disturbing activities will comply with the technology-based effluent limits of this permit.
		Please provide a NPDES 1200-A Permit Application demonstrating that the concrete batch plant proposed for the offsite project area referred to as Boxcar Hill in the LNG Terminal's stormwater management plan (Section 5.3,

		page 19). DEQ will need to determine if rock quarries will operate in compliance with the technology-based effluent limits of this permit.
		Please provide a NPDES Individual Permit Application for the LNG Terminal's two domestic wastewater facilities discharging to surface water. DEQ will use the information in this permit application to develop a discharge permit containing technology-based and water quality-based effluent limits associated with this permit.
		Please provide a NPDES Individual Permit Application for discharges of non-contact cooling wastewater discharged from Liquefied Natural Gas carriers using the Marine Slip at the LNG Terminal. DEQ will use this permit application to develop a discharge permit containing technology-based and water quality-based effluent limits.
		If the discharge from wastewater treatment plants proposed for the LNG Terminal has a design flow capacity of 1 million gallons per day or more or requires pretreatment under 40 CFR §403, please provide a NPDES 1200-Z Permit Application demonstrating that the Terminal's stormwater management plan will comply with the technology-based and water quality-based effluent limits in this permit.
		Please provide an application for a NPDES Individual Permit for the discharge of vehicle and equipment washwater to surface water during the operation of the LNG Terminal. DEQ will use this permit application to develop technology-based and water quality-based effluent limits for this permit if the operations.
		Please provide an application for a NPDES Individual Permit for the discharge of vehicle and equipment washwater to surface water during the construction and operation of the gas pipeline and all its associated facilities. DEQ will use this permit application to develop technology-based and water quality-based effluent limits for this permit.
	Compliance with Clean Water Act Section 302	DEQ will evaluate compliance with CWA Section 302 upon the receipt of information requested above.
	Compliance with CWA Section 303	In compliance with OAR 340-041-0007(8), please provide an assessment of Pacific Connector Gas Pipeline's compliance with all applicable DEQ-approved Total Maximum Daily Load Implementation Plans or compliance programs for the following: • United States Department of Agricultural Forest Service Water Quality Restoration Plans and the USDA National Best Management Practices for Water Quality Management on National Forest System Lands (Volume 1: National Core BMP Technical Guide) noted in DEQ's Memorandum of Understanding with the Forest Service. • US Department of Interior Bureau of Land Management's Water Quality Restoration Plans. • Oregon Department of Forestry's Forest Practices Act Program. • Oregon Department of Agriculture's Water Quality Plans. • Coos County Total Maximum Daily Load Implementation Plan. • Douglas County Total Maximum Daily Load Implementation Plan. • Jackson County TMDL Implementation Plan. • Klamath County TMDL Implementation Plan. In this compliance assessment, please also note all the support documents such as design manuals, guidance documents, road permits etc. that PCGP will follow when complying with these Implementation Plans. In addition, please identify all proposed amendments to federal land and resource management plans that would necessitate amendments to current Forest Service, Bureau of Land Management, or Bureau of Reclamation Total

		Maximum Daily Load Implementation Plans covering the pipeline's construction and operation. Federal Water Quality Restoration Plans represent the Forest Service's and BLM's plan for activities on these federal lands serving as a source of point and nonpoint source pollutants including pollutants addressed in a Total Maximum Daily Load. Finally, for determining compliance with TMDL allocations covering federal lands, please provide for DEQ's review and approval all proposed Forest Service, Bureau of Land Management, and Bureau of Reclamation road permits and access grants or right-of-way permits. For determining compliance with TMDL allocations on non-federal lands, please provide for DEQ's review and approval all proposed easements, agreements, and access or right-of-way permits. This compliance assessment must also include a summary of the steps taken to first avoid and then minimize impacts to the Designated Management Agency's riparian buffer protection areas prior to: • Siting Temporary Extra Work Areas for the pipeline construction • Siting of the construction and the permanent right-of-way for the pipeline. DEQ is requesting this information in response to Pacific Connector Gas Pipeline's proposal to locate TEWAs 50 feet from a waterbody and wetland boundary (see page 25 of Resource Report 1 for the gas pipeline). For example, this setback will not comply with the Forest Service's and Bureau of Land Management's riparian buffer protection requirements as presented in their Water Quality Restoration Plans which serve as their TMDL Implementation Plans. In Resource Report 1 noted above, PCGP notes that there are 922.64 acres of TEWAs. Please identify the location of each TEWA that PCGP will locate within one and two potential tree heights away to 50 feet from waters of the state. For streams, please indicate the distance of each TEWA from the ordinary high water mark of the stream or riverine wetland. Additionally, please note the land ownership where each TEWA is located. In addition, on page 58 of Resource Report 1 for the gas pipeline, PCGP indicates that the pipeline – in some places – will impact riparian vegetation while paralleling streams. Specifically, this report notes that the "proposed route will avoid paralleling a waterbody within 15 feet or less, where feasible." In this report, PCGP notes that this placement is consistent with the Section V.B.2.a of FERC's Wetland and Waterbody Procedures. However, 15 feet of riparian buffer would violate DMA riparian buffer protection requirements. Moreover, based on the literature, a 15-foot riparian buffer for thermal regulation of streams may result in thermal gain to the adjacent water body. As result, please identify each segment of the pipeline's construction right-of-way and permanent right-of-way that is parallel to waters of the state and within two site potential tree heights from waters of the state. Please provide the location and a detailed rationale for siting TEWAs closer to streams than authorized by a DMA's riparian buffer protection requirements and when siting sections of the construction and permanent right-of-way. For example, the PCGP's rationale in Resource Report 1 (page 58) for not proposing setbacks larger than 50 feet in Riparian Reserves is that larger setbacks "would render the TEWA useless for the stream crossing." PCGP should justify its proposal for non-standard riparian buffer protections by providing the following information:

		• A description of the specific constraints at each site preventing the use of a TEWA in an area. • The specific rationale why the TEWA must be closer to the stream crossing. Without this specific information, DEQ cannot determine that Pacific Connector Gas Pipeline attempted to first avoid and minimize riparian impacts to the maximum extent practicable before seeking to mitigate these impacts. This compliance assessment must also identify other locations where PCGP will not comply with Designated Management Agencies' riparian protection areas when siting the following: • Temporary and Permanent Access Roads, • Staging areas, • Material storage areas, and • Other components (e.g., compressor stations, metering stations) of the pipeline. Please include a detailed justification for seeking alternative riparian buffer protection requirements when siting these facilities within riparian areas. Pacific Connector Gas Pipeline must evaluate the thermal impacts from all noncompliance with DMA riparian protection requirements requested above where PCGP has provided and DEQ has approved the following information: • Detailed information demonstrating it considered all actions to first avoid or then minimize impacts to riparian areas to the maximum extent practicable. • Detail rationale for proposing nonstandard widths for riparian buffer protections. This evaluation must be included in PCGP's Thermal Impacts Assessment noted in the comments below on compliance with state water quality standards.
		There is no information presented in Pacific Connector Gas Pipeline's Appendices for Timber Removal and Construction in the Transportation Management Plan (Part 2, Appendix E-8). Please provide the location of the approximately 660 miles of existing public and private roads that PCGP proposes to use to construct the gas pipeline and/or support its operation. In this updated plan, please delineate these existing public and private roads by ownership as follows: • Private road on land zoned for forest use • Private road on land zoned for agricultural use • Private road on land zoned residential/commercial/industrial use by Coos/Douglas/Jackson/Klamath County • Public road owned and operated by Coos/Douglas/Jackson/Klamath County • Public road on the Umpqua/Rogue-Siskiyou/Winema-Fremont National Forest • Public road on land in the Bureau of Land Management Coos Bay District/Roseburg District/Medford District/Klamath Resource Area • Public road on Bureau of Reclamation land

		DEQ will use this information to evaluate compliance with the Section 303 of the Clean Water Act as noted above. There is also no information presented in PCGP's Appendices for Operations and Maintenance in the Transportation Management Plan. Please provide the documentation demonstrating that PCGP inventoried these existing roads to identify necessary maintenance actions and needed improvements to protect water quality prior to their use. This documentation should also include: • The results of the inventory for each road segment and the recommended maintenance prescription for each segment. • The road assessment protocols used (e.g., USDA Forest Service Water/Road Interaction Field Guide) and the evaluation tool (e.g. Geomorphic Road Analysis and Inventory Package) used to evaluate the surface erosion risk, gully risk, landslide risk, and stream crossing failure risk during road use. Please also provide a detailed maintenance and improvement plan for the approximately 660 miles of existing roads. This plan must demonstrate that PCGP will implement all maintenance actions and improvements necessary to protect water quality – identified during the road inventory – prior to road use for pipeline construction or operation. This maintenance and improvement plan must also: • Implement the Designated Management Agencies' DEQ-approved TMDL Implementation Plans. • Comply with maintenance standards, requirements, and/or other design standards developed and used by DMAs to implement these TMDL Implementation Plans. Additionally, please identify the location of all existing roads that PCGP will use to access the gas pipeline during its operation. Please provide a maintenance plan for these existing roads that includes: • A description of the level of use these roads will experience during the pipeline's operation. • A description of the maintenance practices to protect water quality and a schedule for performing these practices and supporting this level of use.
		Please provide the location of the propose 25 miles of new Temporary and Permanent Access Roads and the selection criteria used to site these new roads to avoid and minimize impacts to water quality. Please delineate these new roads by land ownership (e.g., private ownership on land zoned for forest use) consistent with the information request noted above. DEQ will need this delineation by land ownership to evaluate compliance with Section 303 of the Clean Water Act. To ensure these roads will not serve as a source of sediment to and hydromodification of waters of the state and as a source of debris flows into streams from road-related landslides, please include the design standards and specifications for constructing these roads including their drainage systems, cut-slopes, and fill-slopes. Please identify the proposed designs to stabilize fillslopes and cutslopes and manage stormwater on new temporary and permanent roads located on the steep slopes (i.e., slopes greater than 30%) and engineering support for these designs. This information is necessary for DEQ to evaluate compliance with the statewide water quality criteria for

		road building and maintenance (OAR 340-041-0007)(7) and for ensuring that PCGP uses the highest and best practicable treatment control (OAR 340-041-0007(1). Additionally, please provide detailed best management practices and design standards for DEQ review and approval for decommissioning the Temporary Access Roads.
	Compliance with Clean Water Act Section 306	DEQ will complete its review upon the receipt of information requested above.
	Compliance with Clean Water Act Section 307	DEQ will complete its review upon the receipt of information requested above.

	Compliance with other appropriate requirements of state law	DEQ has not completed this review at this time but will consult in the future with other DEQ programs and other state agencies concerning compliance with other state statutory requirements such as:
		
		• Oregon Revised Statute 468B.035 and 105 (Enabling Legislation for Implementing the Coastal Zone Amendments and Reauthorization Act)
		• ORS 783.620 through 640 and 783.990 through 992 (Ballast Water Management Law)
		• ORS 466.020, 075, 105, and 195 (Hazardous Waste Management Law)
		• ORS 196.795 through 990 (Removal-Fill Law)
		• ORS 496.172 – 496.192 (Oregon Threatened and Endangered Species Act)
		• ORS 496.012, 496.138, and ORS 506.109
		  ○ Fish and Wildlife Habitat Mitigation Policy
		  ○ In-water Timing and In-water Blasting Permits
		• ORS 509.585 (Fish Passage Requirements)
		• ORS 498 (Fish Screening)
		• ORS 497.298 (Scientific Taking Permit)
		• ORS 537 (Water Rights Law)
		• ORS 197 (Oregon Land Use Planning Law)
		• ORS 390.235 (Permits for Removal of Archaeological or Historical Material)
		• ORS 569 (Weed Control Law)
		• ORS 527 (Forest Practices Act)
		
		At this time, please provide applications for Construction and Demolition Landfill Permits required under Oregon Revised Statute 459.005 through 418 (Solid Waste Management Law) for the several proposed disposal sites associated with the construction or operation of the gas pipeline.

340-048-0042(2)(a)	Potential Alterations to Water quality standards in OAR 340 Division 41	DEQ is reviewing the Jordan Cove Energy Project's proposed stormwater management plan for the Liquefied Natural Gas Terminal. DEQ will provide comments in another information request.
		In compliance with OAR 340-041-0007(8), please provide for DEQ review and approval the resource and land management plans, guidance, design standards, design manuals, access permits or grants, and other programs from the U.S. Bureau of Reclamation that Pacific Connector Gas Pipeline will use to protect water quality during the following:

		• Siting Temporary and Permanent Access Roads and the construction/permanent right-of-way on U.S. Bureau of Reclamation land, over BOR water-bearing infrastructure (e.g., canals), or paralleling this infrastructure. • Maintaining both Temporary and Permanent Access Roads for pipeline construction and operation. • Siting other components to necessary to construct and operate such as staging areas, material storage areas, and other components (e.g., compressor stations, metering stations) of the pipeline. • Installing the construction and permanent right-of-way for the gas pipeline. • Operating the permanent right-of-way for the pipeline. Please identify any proposed amendments and changes to existing BOR resource and land management plans and other documents noted that are necessary to construct, use, or maintain access roads and the permanent right-of-way on BOR land.
		The scope of work in Pacific Connector Gas Pipeline's August 31, 2017 Thermal Impacts Assessment suggests that PCGP evaluated only stream crossings for their potential to influence or regulate thermal properties of streams. Please indicate if this Thermal Impacts Assessment of the gas pipeline's construction and operation includes the following: • An analysis of the impacts from the 50-foot setbacks from waterbodies in riparian areas currently proposed for the Temporary Extra Work Areas. • An analysis of the impacts from siting the pipeline alignment within riparian areas as close as 15 feet from streams as currently proposed when paralleling these waterbodies. • An analysis of the impacts from siting Temporary and Permanent Access Roads, Staging Areas, material storage area, and other pipeline components (e.g., compressor stations, metering stations) within riparian areas. DEQ is requesting this clarification because the scope of work from the Thermal Impacts Assessment suggests that the estimate of solar loading for stream crossings under both the construction (i.e., 75-95 foot wide) corridor and the permanent (i.e., 30-foot wide) corridor using the Shade-A-Lator tool did not consider the impact of these TEWAs. The use of TEWAs during pipeline construction extends the construction corridor beyond 75 and 95 feet. Currently, the Pacific Connector Gas Pipelines proposes to site TEWAs 50 feet from waterbodies as noted in the comment above. In addition, the scope of work in this assessment does not indicate PCGP evaluated the influence on stream thermal properties when the pipeline's construction and permanent corridor closely parallels streams and comes within 15 feet or less of these streams. For a comprehensive analysis of PCGP's compliance with the temperature standard, PCGP's Thermal Impact Assessment must also evaluate these impacts as well as other impacts (e.g., roads, staging areas etc.) as requested in the comments above on compliance with Section 303 of the Clean Water Act.
		In compliance with OAR 340-041-0007(1) and (7), please provide a post-construction stormwater management plan addressing DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines for all the road stream crossings that Cove Energy Project and Pacific Connector Gas Pipeline will: • Replace or improve to construct and/or operate the gas pipeline and

		• Result in an increase in impervious surface area during the replacement/improvement process. This information is necessary (see OAR 340-048-0042(2)(a)) to determine whether the stormwater discharge from the pipeline's road stream crossings will contribute to or cause violations of water quality standards.
		In compliance with OAR 340-041-0007(1) and (7), please provide a post-construction stormwater management plan addressing DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines for all stream crossings for the pipeline. The focus of this plan should be the drainage area for the right-of-way approaches that discharge stormwater into the stream crossing. To ensure compliance with OAR 340-048-0042(2)(a), please evaluate if the discharge from the pipeline's permanent 30 foot right-of-way at all stream crossings for the pipeline will contribute to or cause violations of water quality standards. In compliance with OAR 340-048-0042(2)(a), please propose the analytical model(s) (e.g., X-DRAIN) that Pacific Connector Gas Pipeline will use to evaluate if the stormwater discharge from the permanent 30 foot right-of-way with its 10 feet of compacted soil overlying the gas pipeline will contribute to or cause violations of water quality standards. In compliance with OAR 340-041-0002(1), this evaluation must also consider the impact of the change in stormwater volume discharged to receiving waters from the vegetation conversion (i.e., from forest canopy to herbaceous vegetation) during pipeline construction. The evaluation of this impact is necessary to determine if pipeline's permanent right-of-way will cause bed and bank erosion and, therefore, violate Oregon's biocriteria water quality standard (i.e., OAR 340-041-0011).
		In compliance with OAR 340-041-0007(1) and (7), please provide a post-construction stormwater management plan addressing DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines for the 30-foot permanent right-of-way for the approximately 117 miles of the proposed pipeline right-of-way traversing steeps slopes (i.e., slopes greater than 30%). This information is necessary before Pacific Connector Gas Pipeline, in compliance with OAR 340-048-0042(2)(a), can determine whether the discharge from the pipeline right-of-way will contribute to or cause violations of water quality standards. The information provided in PCGP's documents (e.g., 401 Application Submittal, drafts of Resource Reports) – made available to DEQ – only provides generic diagrams and erosion controls practices. DEQ can find no information on PCGP's field investigations or remote sensing for these areas to evaluate slope stability when siting the pipeline alignment. DEQ can find no information on the specific designs and practices that PCGP will use on cutslopes and fillslopes located on these steep slopes. In developing this plan in compliance with OAR 340-041-0007(1) and (7), please provide information on the designs and engineering support for these designs for the permanent controls Pacific Connector Gas Pipeline proposes to stabilize cut-slopes and fill slopes for the right-of-way sited along the steep slopes. The purpose of these controls is to prevent sediment discharge in stormwater and debris flows from landslides discharging into streams. Please note these on the post-construction stormwater plan in the information request above. Additionally, please identify where the 117 miles of proposed pipeline noted above coincide with the 94 miles of the proposed pipeline that would be located in soils that PCGP has identified as having a high or severe erosion

		potential. Please provide the designs and engineering support for these designs for the permanent controls in these areas of high/severe erosion potential and steep slopes. In compliance with OAR 340-041-0007(1) and (7), the engineering support must indicate that these permanent controls are sufficient to: • Manage stormwater to prevent erosion on the permanent right-of-way, its cut-slope, and its fill-slope. • Prevent debris flows into streams from landslides from cut-slope and fill-slope failures. On the post-construction stormwater management plan requested above, please also provide the location for these controls along the 117 miles of pipeline on steep slopes (>30%).
		In compliance with OAR 340-041-0007(1) and (7), please provide post-construction stormwater management plans for the proposed 25 miles of new permanent and temporary roads addressing DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines. This information is required before Pacific Connector Gas Pipeline can determine whether the discharge from these new roads will contribute to or cause violations of water quality standards. In compliance with OAR 340-048-0042(2)(a), please propose the analytical model(s) (e.g., X-DRAIN) that Pacific Connector Gas Pipeline will use to evaluate if the stormwater discharge from these 25 miles of proposed new roads will contribute to or cause violations of water quality standards.
		Please provide an evaluation of compliance with water quality standards if Jordan Cove Energy Project and Pacific Connector Gas Pipeline will use dredged material in the construction of facilities in uplands and drainage from this dredge material will discharge to waters of the state. This request is to expand upon the Portland Sediment Evaluation Team's assessment (PSET Letters, January 19, 2016) that considered these constructed upland facilities to be outside federal Clean Water Act jurisdiction for the dredged material suitability determination. However, upland constructed facilities using dredged material are not outside the effects considered in a 401 Water Quality Certification of a FERC application for the construction of a gas pipeline.
		Please provide a post-construction stormwater management plans addressing DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines for North Point Workforce Housing Project noted in the Part 1, Section 404 Permit Application, Attachment F, Portland Sediment Evaluation Team Letters, Section 404 Permit Application. (If this site is not going to be used for the North Point Workforce Housing, please provide the post-construction stormwater plans for the proposed uses.) In addition, please provide the results of the Phase II environmental assessments evaluating the potential for contaminated soils summarized in the "FEIS, Section 4.3.1.3 (Soil Limitations) as noted in these PSET Letters.
		The 401 Water Quality Submittal package provides insufficient information concerning the dredging operations for the Marine Slip, Access Channel, and Material Offloading Facility. DEQ used a copy of Resource Report 1 (Section 1.5.5.2) for the development of an Environmental Impact Statement to obtain general information on the dredging operation. To direct the reader to additional information, this resource report references to the Dredge Material Management Plan and Resource Report 7 (Section 7.3.2.5). These two additional references provide few details regarding the water pollution control practices in the Marine Slip and Access Channel dredging operations. In compliance with OAR 340-041-0007(1) and -0036, please provide for DEQ review and approval a detailed pollution control plan for constructing the Access Channel and Marine Slip that provides at least the following information:

		• A detailed description of the sequencing of all construction dredging activities associated with the in-water Marine Slip construction, Access Channel construction, and Material Offloading Facility construction. • A site map of these construction actions and location of all structural controls to protect water quality. The site maps must include the following information: o A delineation of the areas in the Marine Slip that Jordan Cove will dry excavate and dredge. ▪ Please include the pollution controls for the dry excavation activities in response to the request above for an Erosion and Sediment Control Plan for a NPDES 1200-C Permit Application. o The location of the natural earthen berm separating the upland area of the Marine Slip that Jordan Cove will dry excavate from the remaining portion of the Marine Slip adjacent to the bay that Jordan Cove will dredge. o The location of the in-water dredging for the Access Channel and Material Offloading Facility. o The location of the slurry/hydraulic transport pipeline(s) for the transportation of the dredged material. o The location of all containment systems and/or spill response materials. • A construction dredging plan providing the following: o Dredging schedule for the Marine Slip, Access Channel, and Material Offloading Facility. o Type (e.g., cutter-suction dredging) and number of dredging plants that Jordan Cove will use during the dredging of the Marine Slip, Access Channel, and the Material Offloading Facility. o A description of water pollution controls (operational controls, structural such as floating turbidity curtain etc.) that Jordan Cove will use in dredging and transporting dredged material. o Detailed spill response procedures including all emergency shut-off procedures and procedures for a spill associated with the hydraulic transport pipeline. o A description of all operational and structural water pollution controls for breaching and removing the natural earthen berm noted in Section 1.5.5.4 of the Jordan Cove's Resource Report 1. o A dredging monitoring plan for DEQ review and approval to evaluate the effectiveness of all proposed controls. • A maintenance dredging plan providing the following: o A site map containing the following: ▪ The location of all areas Jordan Cove will dredge. ▪ The location of the slurry/hydraulic transport pipeline(s) for the transportation of the dredged material. ▪ The location of all containment systems and/or spill response materials. o Dredging schedule. o Type (e.g., cutter-suction dredging) and number of dredging plants that Jordan Cove will use during the maintenance dredging. o A description of water pollution controls (operational controls, structural controls such as floating turbidity curtain etc.) that Jordan Cove will use and the location of all structural controls to minimize the migration of turbid water from maintenance dredging activities, o Detailed spill response procedures including all emergency shut-off procedures and procedures for a spill associated with the hydraulic transport line. o A dredging monitoring plan for DEQ review and approval to evaluate the effectiveness of all proposed controls.
		In compliance with OAR 340-041-0007(1) and -0036, please provide for DEQ review and approval a detailed water pollution control plan presenting all practicable operational and structural control techniques that Jordan Cove

		Energy Project will employ when constructing the Material Offloading Facility east of the opening for the slip at the Liquefied Natural Gas Terminal. Please include in this plan a characterization of the fill material Jordan Cove will use to construct this facility that evaluates this fill material for contamination.
340-048-0042(2)(b)	Existing and potential designated beneficial uses of surface water or groundwater that might be affected by the activity	DEQ will perform this review upon the receipt of information requested elsewhere in this matrix.
340-048-0042(2)(c)	Potential water quality impacts from the use, generation, storage, or disposal of hazardous substances	DEQ will perform this review upon the receipt of information requested elsewhere in this matrix.
340-048-0042(2)(d)	Potential modifications of surface water quality or quantity affecting water quality	DEQ will perform this review upon the receipt of information requested above. In addition to these requests for information, please provide to DEQ an application for an Individual Industrial Water Pollution Control Facility Permit for the proposed discharges of the hydrostatic testing wastewater. Please provide the location of each point of discharge. If Jordan Cove Energy Project or Pacific Connector Gas Pipeline expects to discharge washwater to the ground from vehicle and equipment washing, please provide an application for a Water Pollution Control Facility Individual Permit for these discharges. Please provide the location of each point of discharge.
340-048-0042(2)(e)	Potential modifications of groundwater quality that might affect surface water quality.	DEQ will perform this review upon the receipt of information requested elsewhere in this matrix. In addition to these requests for information, please provide a copy of the results from the first phase (i.e., desktop data review with maps) of the Shallow Groundwater Study (Revised August 24, 2017 by GeoEngineers) showing suspected locations of shallow groundwater along the pipeline right-of-way. Please expand the maps proposed in this study to include suspected locations of shallow groundwater along the proposed route for the 25 miles of Temporary or Permanent Access Roads. When complete, please provide the results from the implementation of the subsurface exploration plan proposed for phase two of this study with an analysis of how the construction and permanent right-of-way will impact shallow groundwater as well as the construction of any proposed new roads. Moreover, please propose practices for how Pacific Connector Gas Pipeline will avoid, minimize, and, if necessary, mitigate the impacts identified in the Shallow Groundwater Study noted above.

340-048-0042(2)(f)	Potential water quality impacts from the construction of intake, outfall, or other structures associated with the activity.	DEQ will perform this review upon the receipt of information requested elsewhere in this matrix.
340-048-0042(2)(g)	Potential water quality impacts from wastewater discharges.	DEQ will perform this review upon the receipt of information requested elsewhere in this matrix.
340-048-0042(2)(h)	Potential water quality impacts from construction activities.	DEQ will perform this review upon the receipt of information requested elsewhere in this matrix.
340-048-0042(2)(i)	Compliance with plans applicable under Section 208 of the CWA.	Please provide signed Land Use Compatibility Statements from Coos, Douglas, Jackson, and Klamath Counties.

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Oregon
Kate Brown, Governor

Department of Environmental Quality
Western Region Eugene Office
165 East 7th Avenue, Suite 100
Eugene, OR 97401
(541) 686-7838
FAX (541) 686-7551
TTY 711

December 20, 2018

Derik Vowels
Jordan Cove LNG, LLC
Consultant, Lead Environmental Advisor
111 SW 5th Ave., Suite 1100,
Portland OR 97204

Re: Supplemental Information Request
Response to October 8, 2018 Jordan Cove Correspondence

Jordan Cove Energy Project (FERC Project No. CP17-494)
Pacific Connector Gas Pipeline (FERC Project No. CP17-495)
U.S. Army Corps of Engineers (Project No. NWP-2017-41)

Dear Mr. Vowels:

The Oregon Department of Environmental Quality (DEQ) is currently reviewing an application from Jordan Cove LNG, LLC (Jordan Cove) for Clean Water Act section 401 water quality certification for a Section 404 permit from the U.S. Army Corps of Engineers necessary to construct the Jordan Cove Energy Project and Pacific Connector Gas Pipeline (collectively, "the Project").

On September 7, 2018, DEQ requested additional information from Jordan Cove to assist with our project analysis. Jordan Cove provided responses to the information request on October 8, 2018. In general, DEQ finds that many of Jordan Cove's responses do not fully address the information requests in our September 7, 2018, correspondence. Certain responses, for example, provide qualitative descriptions of best management practices or refer to previously submitted information. To be clear, measures proposed to reduce project-related water quality impacts must be supported by quantitative data, such as engineering specifications or output from appropriate numerical models, to demonstrate compliance with applicable water quality objectives.

DEQ has supplemented its September 7, 2018, information request. The supplemental data request, provided as Attachment A, provides comments and clarifies, as needed, the information deemed necessary to meet certification requirements. For consistency, Attachment A retains the numbering format initiated by Jordan Cove in their October 8, 2018, response.

Please file a complete response to this supplemental information request by January 22, 2019, to:

Christopher Stine
Oregon Department of Environmental Quality
165 East 7th Avenue, Suite 100
Eugene, Oregon 97401

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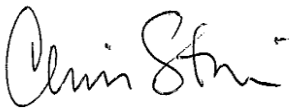
If Jordan Cove cannot provide certain information within the requested period, please indicate which items will be delayed and provide a projected filing date.

If you have any questions, please contact me directly at (541) 686-7810, or via email at stine.chris@deq.state.or.us.



Christopher Stine, PE

Water Quality Engineer

Attachment A: Response to Jordan Cove's October 8, 2018 Information Filing

ec: Mike Koski, mkoski@pembina.com
Natalie Eades, Neades@pembina.com
Tyler Krug, Tyler.J.Krug@usace.army.mil
John Peconom, John.Peconom@ferc.gov
Sean Mole, sean.mole@oregon.gov
DEQ: Keith Andersen, Dave Belyea, Steve Mrazik, Chris Bayham, Mary Camarata, Sara Christensen
FERC Dockets: CP17-494-000, CP17-495-000

Comment No.	September 7, 2018 Information Request	Jordan Cove Response	DEQ's Review and Response to Jordon Cove's Response
1, 2	Must provide and timely update DEQ with complete description of construction/operation activities and specify clearly DEQ's acceptance of submissions as changes to proposed activities.	Jordan Cove will notify DEQ to update 401 application materials.	DEQ accepts response.
3	Must provide directly to DEQ a comprehensive description of the propose action including all resource reports, maps, electronic data files etc.	Jordan Cove will provide links to DEQ to access all information.	DEQ accepts response.
4, 5	Comment 4: Water Quality Standards Oregon's water quality standards consist of beneficial uses, numeric and narrative criteria developed to support these uses, and an antidegradation policy that prohibits an activity from further degrading water quality. Applicants for water quality certification must provide sufficient information to demonstrate the activity will comply with Oregon water quality standards (OAR 340-048-0020(g)). Comment 5: Provide information to demonstrate how the Project will comply with the water quality standards found in OAR 340 Division 041. For project activities that do not	The JCEP 401 Water Quality Memorandum (Part 1) and PCGP 401 Water Quality Summary Table (Part 2, Appendix A) in the application specifically address the Project's compliance with Oregon water quality standards.	**Summary Statement: Jordan Cove references previously submitted material that describes Best Management Practices to reduce project effects on water quality. Citing potential BMPs by themselves is insufficient. DEQ recognizes BMPs as one part of a broader strategy that must also consider existing water quality, local environmental conditions, the anticipated magnitude of project-related effects, and appropriate engineering controls to mitigate negative effects on water quality. Proposed BMPs must be well-supported using quantitative analyses such as modeling, manufacturer's technical specifications, results of pilot tests, or other quantitative data to support their site-specific use to effectively achieve water quality objectives. Please provide a plan that demonstrates how proposed BMPs or other engineering controls will protect water quality at each location where project actions may directly or indirectly affect waters of the state. The plan should provide a site-specific analysis of each proposed activity and technical justification for each proposed remedy as discussed more fully in the following section.** Jordan Cove's responses must provide a comprehensive analysis of potential project-related water quality impacts or the quantitative data necessary to evaluate proposed remedies. Jordan Cove's responses frequently refer to plans that rely on qualitative descriptions of BMPs with no site-specific reference to individual waterbodies, water quality conditions, or a discussion of proposed activities. Applications that propose BMPs to mitigate water quality impairment must identify the location, design details including engineering technical data, and a maintenance schedules to ensure adequate protection during use. In developing its response, Jordan Cove should refer to the information below. Jordan Cove must include quantitative and/or engineering support for the proposed controls or best management practices. For example, DEQ suggests using models such as Geomorphic Road Analysis and Inventory Package (GRAIP) and X-DRAIN to provide DEQ with the requested evaluation of potential water quality impacts from PCGP's proposal to use existing roads and to build new roads. Adequate quantitative analysis is necessary to demonstrate that current and future

	affect State waters, note how the Project will not violate applicable standards. For project activities that impact State waters, note how Jordan Cove is proposing to mitigate, reduce, or prevent impacts so as to ensure the Project, as proposed, does not violate applicable water quality standards. Project impacts should be assessed in terms of direct, indirect, and cumulative effects of the activity on state water quality.		erosion control planning will not "cause or contribute to a violation of in-stream water quality standards" as required in Schedule A.10.a of the NPDES 1200-C General Permit and OAR 340-048-0042(2)(a). Jordan Cove's response does not include estimates of sediment discharge from the construction and post-construction right-of-way. Models such as the Revised Universal Soil Loss Equation Version 2 (RULSE2), Watershed Assessment Tool for Environmental Risk (WATER), and/or Soil and Water Assessment Tool (SWAT) may be used to quantitatively estimate sediment control practices. PCGP can use GRAIP noted above to evaluate the need for BMPs on existing access roads for pipeline construction and operation.[1, 2, 3] Qualitative descriptions of proposed erosion and sediment control practices do not adequately demonstrate that measures will sufficiently mitigate risks to water quality. Jordan Cove must provide well-supported quantitative analyses of proposed engineering remedies based on site-specific understanding of water quality conditions. DEQ's comments on PCGP's response to Comment 15 provide additional examples of information required to demonstrate compliance with Oregon water quality standards.
6, 7	Comment 6: Please provide a NPDES 1200-C Permit Application demonstrating that land disturbing activities associated with the construction of Jordan Cove Energy Project's Liquefied Natural Gas Terminal as well as the following: • Land disturbing activities associated with the dry excavated portion of this terminal's Marine Slip, • Land disturbing activities associated with all offsite project areas associated	Jordan Cove's will submit its permit application for construction & land disturbing activities at the LNG Terminal to DEQ in Q4 2018.	**Summary Statement: DEQ will need detailed Site Map and Drawings for an NPDES 1200-C General Permit for:** • **Constructing the LNG Terminal and all its associated components.** • **Constructing the entire length of the pipeline and all associated components for constructing and operating this pipeline.** **The Site Maps and Drawings for these two construction projects must fully address Schedule A.12 of this permit as well as all the other applicable permit conditions. In developing these drawings, PCGP will need to provide geo-engineering analyses and the technical support for these analyses for the following concerns:** • **All cut and fill areas for the construction right-of-way and road improvements (Schedule A.12.b.v.3.b).** • **Construction stormwater discharge points for the construction right-of-way and road improvements (Schedule A.12.b.v.3.d).** • **Areas used for storage of logs, soils, or wastes (Schedule A.12.b.v.3.e).** **DEQ requests that PCGP use one of three modeling options noted in the section below to identify potential unstable slopes requiring further geotechnical analyses and engineering. Additionally, in the section below, DEQ provides**

[1] Natural Resource Conservation Service and USDA Agricultural Research Service. 2008. Revised Universal Soil Loss Equation, Version 2 (RULSE2)
[2] Wilson, Bruce N. Aleksey Sheshukov, and Reid Pulley. 2006. Erosion Risk Assessment Tool for Construction Sites (Final Report). Office of Research Administration. Minnesota Department of Transportation
[3] Gassman, P.W., M.R. Reyes, C.H. Green, and J.G. Arnold. 2007. The Soil and Water Assessment Tool: Historical Development, Applications, and Future Research Directions. American Society of Agricultural and Biological Engineers. Volume 50(4): 1211-1250

	with this terminal and its construction including those areas described in Section 5.3 of this terminal's stormwater management plan (Part 1, Attachment A3). • Land disturbing activities associated with roads used to access this terminal and offsite project areas. • Land disturbing activities associated with any other facilities (staging areas, refueling areas, employee parking etc.) that Jordan Cove Energy Project will use to construct of this terminal. <u>Comment 7</u>: DEQ will need to determine if these land disturbing activities will comply with the technology-based effluent limits of this permit. DEQ will also need an erosion and sediment control plan that, for example, addresses Schedule A.12.b.v and other conditions in this permit. For DEQ to evaluate the water quality impacts of the construction process on waters of the state, DEQ needs this information in an erosion and sediment control plan.		**examples of the level of detail DEQ is seeking from Jordan Cove and the data gaps in Jordan Cove's current planning documents. DEQ provides the rationale for this information request in the section below.** A complete NPDES 1200-C Permit Application is necessary for Jordan Cove to comply with the following: • NPDES 1200-C General Permit Conditions (Schedule A.1,10, and 12 in particular) • OAR 340-041-0007(1) and (7) • OAR 340-048-0042(2) Jordan Cove's response to Comment 6 only recognizes the need to address construction/land disturbing activities associated with the LNG Terminal. Jordan Cove's response does not address the need to develop a required erosion and sediment control plan for the approximately 229 miles of pipeline as noted in comments in AIR-1. As noted in the sources covered by the NPDES 1200-C General Permit, these include construction activities that are part of a common plan of development. For example, this includes land disturbing activities to widen an existing road, develop employee parking, lodging for workers, and develop communication towers. To comply with the technology-based effluent limits in this permit and, in particular, Schedule A.12 of this permit, Jordan Cove will need to demonstrate that the Site Map and Drawings for approximately 229 miles of pipeline construction right-of-way contains the following: *a. Preparation.* *i. The permit registrant must ensure that an ESCP is prepared and revised as necessary to reflect site conditions for the construction activity regulated by this permit, and submit revisions to DEQ or Agent in accordance with requirements of this permit. The design, installation, and maintenance of erosion and sediment controls must be adequate to address factors such as the amount, frequency, intensity, and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.* *ii. Qualifications to Prepare ESCP.* *1. For construction activities disturbing 20 or more acres, the ESCP must be prepared and stamped by a Certified Professional in Erosion and Sediment Control, Certified Professional in Storm Water Quality, Oregon Registered Professional Engineer, Oregon Registered Landscape Architect, or Oregon Certified Engineering Geologist.* *2. If engineered facilities such as sedimentation basins or diversion structures for erosion and sediment control are required, the ESCP must be prepared and stamped by an Oregon Registered Professional Engineer.* *b. The ESCP must include the following elements:* *i. Name of the site.* *ii. Local Government Requirements. Include any procedures necessary to meet applicable local government erosion and sediment control or stormwater management requirements.*

	Please provide a NPDES 1200-C Permit Application for land disturbing activities associated with the construction of Pacific Connector's gas pipeline and with the construction of all associated facilities such as communication towers, roads (existing and new), disposal sites, block valve facilities, and compressor stations. DEQ will need to determine if these land disturbing activities will comply with the technology-based effluent limits of this permit. DEQ will also need an erosion and sediment control plan that, for example, addresses Schedule A.12.b.v and other conditions in this permit. For DEQ to evaluate the water quality impacts of the construction process on waters of the state, DEQ needs this information in an erosion and sediment control plan.		*iii. Erosion and Sediment Control Inspector.* *1. Inspections must be conducted by a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact stormwater quality, is knowledgeable in the correct installation of the erosion and sediment controls, and is able to assess the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the construction activity.* *2. Beginning January 1, 2017, for projects that are five or more acres, inspections must be conducted by a person certified in an erosion and sediment control program that has been approved by DEQ. DEQ has approved the following programs:* *a. Certified Professional in Erosion and Sediment Control,* *b. Certified Professional in Storm Water Quality,* *c. Washington State Certified Erosion and Sediment Control Lead, or* *d. Rogue Valley Sewer Services Erosion and Sediment Control Certification.* *3. Inspections must be conducted by the Erosion and Sediment Control Inspector identified in the ESCP.* *4. Provide the following for all personnel that will conduct inspections:* *a. Name and title;* *b. Contact phone number and, if available, e-mail address; and* *c. Description of experience and training.* *iv. Narrative Site Description.* *1. Description of the construction activity;* *2. Proposed timetable indicating when each erosion and sediment control BMP is to be installed and the duration that it is to remain in place;* *3. Estimates of the total area of the permitted site and the area of the site that is expected to undergo clearing, grading or excavation;* *4. Nature of the fill material to be used, and of the site soils prior to disturbance;* *5. Names of the receiving water(s) for stormwater runoff;* *6. The types of pollutants that could be found in stormwater and their likely sources;* *7. Any authorized non-stormwater discharges; and* *8. If a surface water of the state is within 50 feet of the permitted activities,* *a. Description of area within 50 feet of project site (including any natural buffer), and* *b. Description of approach to manage the natural buffer zone, if any (for example, maintain natural buffer, reduce natural buffer and increase BMPs, or eliminate flow through natural buffer).* *v. Site Map and Drawings.*

			1. *The site map and drawings must be kept on site and must represent the actual BMP controls being used onsite;* 2. *The site map must show sufficient roads and features for DEQ or Agent to locate and access the site;* 3. *The site map and drawings must include (but is not limited to) the following features (as applicable):* a. *Total property boundary including surface area of the development;* b. *Areas of soil disturbance (including, but not limited to, showing cut and fill areas and pre- and post-development elevation contours);* c. *Drainage patterns before and after finish grading;* d. *Discharge points;* e. *Areas used for the storage of soils or wastes;* f. *Areas where vegetative practices are to be implemented;* g. *All erosion and sediment control measures or structures;* h. *Impervious structures after construction is completed (including buildings, roads, parking lots and outdoor storage areas);* i. *Springs, wetlands and other surface waters on site or adjacent to the site;* j. *Temporary and permanent stormwater conveyance systems;* k. *Onsite water disposal locations (for example, for dewatering);* l. *Storm drain catch basins depicting inlet protection, and a description of the type of catch basins used (for example, field inlet, curb inlet, grated drain and combination);* m. *Septic drain fields;* n. *Existing or proposed drywells or other UICs;* o. *Drinking water wells on site or adjacent to the site;* p. *Planters;* q. *Sediment and erosion controls including installation techniques;* r. *Natural buffer zones and any associated BMPs for all areas within 50 feet of a water of the state; and* s. *Detention ponds, storm drain piping, inflow and outflow details.* The requirements noted above are critical for evaluating the potential efficacy of JCEP's/PCGP's erosion and sediment control program and proposed structural erosion and sediment controls as applied on the landscape along the entire pipeline alignment. This information is also critical for ensuring compliance with 1200-C permit requirements when construction is in progress. For example, in PCGP's Erosion Control and Revegetation Plan [Part 2, Appendix B, 404-10 JPA), Section 3.3.4] states:

			Temporary erosion control measures will be installed after vegetation clearing and immediately prior to/after initial soil disturbance…Section 4.0 of the ECRP describes in detail the temporary erosion control procedures or BMPs that will be implemented during construction to minimize impacts from erosion and sedimentation.. This information does not indicate to DEQ where, for example, PCGP will locate construction storage areas for soils, logs, boulders, and other construction debris. This information does not indicate where PCGP will locate stormwater discharge points as required in the NPDES 1200-C General Permit. PCGP does not indicate where PCGP will install erosion and sediment controls in the construction right-of-way and associated facilities during the construction phase. DEQ needs this information to determine if PCGP will store logs, rock, soil, and other construction debris from forest clearing operations and construction materials on or at the head mapped landslides or areas identified Potential Rapidly Moving Landslides Hazards. The Tyee Core Area is prevalent in the Oregon Coast Range where PCGP proposes to install the pipeline. The Tyee Core Area is commonly associated with thick sandstone beds that have few fractures. These beds allow water to concentrate in shallow soils overlying these beds creating positive soil pressure and the hazard of shallow, rapidly moving landslides. Human-caused landslides diminish water quality when they discharge into surface waters. Placement of additional weight and the discharge of construction or post-construction stormwater on to an unstable slope in the Tyee Core Area can initiate a landslide/debris torrent affecting water quality. In DEQ's desktop analysis of PCGP's proposed pipeline construction activities using maps provided by PCGP as well as aerial photos and datasets available to DEQ, DEQ has identified numerous potential constraints along the proposed pipeline alignment. If PCGP does not identify and address these in the construction and operation planning, these constraints have the potential to impact water quality. Constraints such as mapped landslide areas and convergent headwalls (see examples in the review, below) are numerous along the pipeline alignment. PCGP has provided limited analysis and recommendations and no site-specific engineering plans, specifications, and supporting technical analyses for how PCGP will construct and operate the pipeline among these constraints. As discussed in DEQ's comments below, the pipeline right-of-way with its area of soil compaction above the gas pipeline is essentially functioning as a permanent, primitive road alignment. Therefore, research and engineering evaluations such as those concerning roads on steep and/or unstable slopes are suitable technical references for identifying constraints that – if not addressed – may impact water quality. PCGP will need to formulate site-specific controls to prevent, for example, debris flows into streams initiated from pipeline construction and operation. DEQ will not accept the generic best management practices currently presented in PCGP's Erosion Control and Revegetation Plan as a substitute for the detailed information requested above and below in this review. During its desktop analysis, DEQ identified several landscape features or constraints discussed in more detail in the technical reference in *Slope Engineering for Mountain Roads* (Hearn 2011). In DEQ's review of PCGP's response to Comment 15, DEQ highlights below several examples of these constraints. These examples represent potential site-specific

			constraints that could impact water quality that PCGP did not address in its 401 Water Quality Certification submittal. In developing its Certification decision, DEQ must evaluate PCGP's efforts to identify and, if needed, develop engineering solutions to site-specific constraints encountered during its planning and field investigations for the following: (1) constructing and operating the pipeline, (2) using existing access roads, (3) improving/reconstructing existing access roads, and (4) building new roads. In reviewing the Section 4.0 of the PCGPs Erosion Control and Revegetation Plan for more detail, DEQ can find no information on where exactly PCGP will locate stormwater discharge from the construction right-of-way, the Temporary Extra Work Areas, and other areas cleared of vegetation. DEQ is seeking this information to determine how PCGP will manage construction stormwater discharge to streams, wetlands, Areas of Potential Rapidly Moving Landslide Hazards, and mapped landslides. Without this detailed information regarding how PCGP will address these significant constraints during the construction process, DEQ can only assume that PCGP will execute its erosion and sediment control program in an impromptu fashion consequently placing waters of the state at risk. DEQ requests PCGP employ one of the slope stability models noted below to identify potential unstable slopes. This information would guide the following: • Siting of log, construction debris, and/or equipment storage. • Design of the construction stormwater management and discharge system. • Design of the post-construction stormwater management and discharge system. • Design of cut and fill slopes for the pipeline alignment and access roads. To identify potential unstable slopes needing further geotechnical analyses and engineering, DEQ request the application of one of the following models: • Deterministic Level I Stability Analysis (DLISA) and Probabilistic Level I Stability Analysis (LISA).[4] • Shallow Landsliding Stability Model (SHALSTAB).[5] • Map-based Probabilistic Infinite Slope Analysis Program (PISA-m).[6] In DEQ's review of PCGP's response to Comment 15 below, DEQ highlights examples where PCGP is proposing to discharge construction/post-construction stormwater and store logs/construction spoils/etc. along concave-shaped slopes without providing DEQ with a slope stability analysis in its submittal. As discussed below, human actions initiate many debris flows within concave-shaped slopes and water plays a key role in destabilizing slopes.

[4] Koler, Thomas E. 1998. Evaluating Slope Stability in Forest Uplands with Deterministic and Probabilistic Models. Environmental & Engineering Geoscience, Volume IV, No. 2, pp. 185-194

[5] Montgomery, David R. Montgomery and William E. Dietrich. 1994. A Physically Based Model for the Topographic Control on Shallow Landsliding. Water Resources Research. Vol. 30, No. 4, pp. 1153-1171

[6] Haneberg, William C., William F. Cole, and Gyimah Kasali. 2009. High-Resolution Lidar-Based Landslide Hazard Mapping and Modeling. Bulletin of Engineering Geology and the Environment. 68:263-276

8	Please provide a NPDES 1200-A Permit Application demonstrating that the proposed 20 sites to obtain rock for Pacific Connector's gas pipeline construction and maintenance. DEQ will need to determine if these land disturbing activities will comply with the technology-based effluent limits of this permit.	PCGP will obtain rock commercially.	PCGP will not need coverage under NPDES 1200-A for rock material that is obtained commercially. PCGP will need to update the information in the 401Water Quality submittal package to reflect this revision to its proposal.
9	Please provide a NPDES 1200-A Permit Application demonstrating that the concrete batch plant proposed for the offsite project area referred to as Boxcar Hill in the LNG Terminal's stormwater management 9 plan (Section 5.3, page 19). DEQ will need to determine if rock quarries will operate in compliance with the technology-based effluent limits of this permit.	Jordon Cove's contractor KBJ will obtain a permit prior to operating.	DEQ understands Jordan Cove's contractor will apply for and receive coverage under NPDES 1200-A General Permit for the concrete batch plant at Boxcar Hill.
10, 11, 13	Comment 10: Please provide a NPDES Individual Permit Application for the LNG Terminal's two domestic wastewater facilities discharging to surface water. DEQ will use the information in this permit application to develop a discharge permit containing technology-based and water quality-based effluent limits associated with this permit.	JCEP is preparing an application for submittal in Q4 2018 to modify existing Permit No. 101499. JCEP provided a Discharge Characterization Memo to DEQ on May 25, 2018.	DEQ anticipates a response to this request in Q4 2018. The information provided in JCEP's Discharge Characterization Memo is insufficient for DEQ to draft a NPDES Individual Permit for the LNG Terminal's domestic wastewater discharge.

	Comment 11: Please provide a NPDES Individual Permit Application for discharges of non-contact cooling wastewater discharged from Liquefied Natural Gas carriers using the Marine Slip at the LNG Terminal. DEQ will use this permit application to develop a discharge permit containing technology-based and water quality-based effluent limits. Comment 13: Please provide an application for a NPDES Individual Permit for the discharge of vehicle and equipment washwater to surface water during the operation of the LNG Terminal. DEQ will use this permit application to develop technology-based and water quality-based effluent limits for this permit if the operations.		
12	If the discharge from wastewater treatment plants proposed for the LNG Terminal has a design flow capacity of 1 million gallons per day or more or requires pretreatment under 40 CFR §403, please provide a NPDES 1200-Z Permit Application demonstrating that the Terminal's stormwater	JCEP submitted a stormwater management plan to DEQ on February 6, 2018.	Information provided by JCEP indicates operation of these two small treatment plants would not require coverage under a NPDES 1200-Z General Permit. For this reason, JCEP will not need to submit an application to DEQ for a NPDES 1200-Z General Permit for the LNG Terminal.

	management plan will comply with the technology-based and water quality-based effluent limits in this permit.		
14	Please provide an application for a NPDES Individual Permit for the discharge of vehicle and equipment washwater to surface water during the construction and operation of the gas pipeline and all its associated facilities. DEQ will use this permit application to develop technology-based and water quality-based effluent limits for this permit.	JCEP and PCGP is preparing a NPDES 1200-C permit application and the ESCP in this application will describe how this wastewater will be treated before discharge under this 1200-C General Permit.	Schedule A.6.a-c of the NPDES 1200-C General Permit prohibits the discharge of wastewater from construction operations and vehicle/equipment washing operations. To comply with NPDES 1200-C General Permit requirements and OAR 340-045-0015(1)(a), PCGP must submit a separate NPDES and/or WPCF Individual Permit Application for the discharge of equipment and vehicle wash water to waters of the state.
15	In compliance with OAR 340-041-0007(8), please provide an assessment of Pacific Connector Gas Pipeline's compliance with all applicable DEQ-approved Total Maximum Daily Load Implementation Plans or compliance programs for the following: • United States Department of Agricultural Forest Service Water Quality Restoration Plans and the USDA National Best Management Practices for Water Quality Management on National Forest System Lands (Volume 1: National Core BMP Technical Guide) noted in DEQ's	PCGP provided DEQ Appendix A of Part 2 of the 401 Water Quality Package to DEQ demonstrating compliance with water quality standards and the plans used to meet water quality standards. The conditions in the Federal ROW grants will ensure compliance with applicable water quality plans.	**<u>Summary Statement</u>:** **PCGP's response does not fully address the requirements described in Comment 15. DEQ requires a comprehensive analysis using appropriate quantitative support to demonstrate compliance with water quality objectives, including TMDLs. As requested in Comment 15 and more fully described below, please describe how PCGP will comply with the Federal, State, and County plans/programs for complying with TMDLs. Please include or identify relevant supporting documents (e.g., design manuals, standards, and specifications) that each Designated Management Agency uses to implement their TMDL compliance programs. DEQ will need to review the conditions in all Federal access or right-of-way grants to ensure these conditions comply with OAR 340-048-0042(2).** Plans referenced by Jordan Cove provide a qualitative analysis of proposed BMPs. As discussed previously, DEQ requires BMPs to be supported by an evaluation of existing water quality, the impact of the proposed activity on water resources, and a quantitative assessment of mitigation provided by the proposed BMPs. For example, PCGP briefly describes BMPs in a table in Part 2 Attachment G that PCGP asserts will comply with water quality standards. In making this assertion, PCGP lists various plans developed to comply water quality standards. PCGP includes no analysis to demonstrate these BMPs will prevent a water quality violation for all pollutant discharges. Certain portions of the project that occur on state and federal lands are governed by existing TMDLs. PCGP has not demonstrated to DEQ that proposed activities such as right-of-way construction, road maintenance, and road construction will comply with USDA Forest Service, U.S. Department of Interior BLM, Bureau of Reclamation, Oregon Department of Forestry, and County Total Maximum Daily Load compliance plans and programs. DEQ developed these TMDL to achieve compliance with water quality standard in water bodies impaired by specific pollutants. For an example of this deficiency in PCGP's response to AIR-1, please refer to DEQ's review of PCGP's response to Comment 24 demonstrating that some

	Memorandum of Understanding with the Forest Service. • US Department of Interior Bureau of Land Management's Water Quality Restoration Plans. • Oregon Department of Forestry's Forest Practices Act Program. • Oregon Department of Agriculture's Water Quality Plans. • Coos County Total Maximum Daily Load Implementation Plan. • Douglas County Total Maximum Daily Load Implementation Plan. • Jackson County TMDL Implementation Plan. • Klamath County TMDL Implementation Plan. In this compliance assessment, please also note all the support documents such as design manuals, guidance documents, road permits etc. that PCGP will follow when complying with these Implementation Plans.		of PCGP's proposed activities will not comply with Forest Service, BLM, ODF, and County TMDL compliance programs without the submittal of additional information. Under state rules, TMDL compliance plans are enforceable when Designated Management Agencies such as the Forest Service, BLM, and ODF, for instance, fail to implement these plans. Right-of-way permits are not the only mechanism these Federal agencies will use to ensure compliance with their Water Quality Restoration Plans.[7, 8, 9] WQRPs can and do address road impacts on water quality. Federal agencies address these impacts in their efforts to comply with Clean Water Act requirements such as Section 303. DEQ provides PCGP an example of how federal agencies use WQRPs to address road impact on water quality in DEQ's review of PCGP's response to Comments 26 and 27 below. For this reason, DEQ will review all proposed road permits to cover all access roads Jordan Cove will use to construct and operate the terminal and gas pipeline. If acceptable, DEQ will use the conditions provided in Federal road permits when developing its Certification Decision. In Appendix A of Part 2 of the 401 Water Quality Package cited in PCGP's response to Comment 15, PCGP lists in a table the following: • Potential impairment parameters. • Sources and activities associated with these potential impairment parameters. • PCGP's proposed plans/BMPs developed to comply with water quality standards. In many of these plans and reports, PCGP provides only a qualitative description of actions or BMPs PCGP will use to avoid violations of water quality standards. DEQ highlights specific examples below. For example, PCGP provides no quantitative analysis or engineering designs with technical support demonstrating that the construction of the pipeline and operation of the pipeline right-of-way will prevent water quality impairments from landslides and sediment discharge resulting from the following: • Design and maintenance of roads. • Design of both the construction and permanent pipeline right-of-way. PCGP's qualitative analysis of compliance with water quality standards does not even list the more than 660 miles of access roads as a source of sediment. The scientific literatures clearly shows roads as a major source of sediment and soil erosion in forested watersheds. The scientific literature identifies road maintenance practices, road construction decisions,

[7] USDA Forest Service and DOI Bureau of Land. 1999. *Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters*. USDA Forest Service, Pacific Northwest Region

[8] Memorandum of Understanding Between State of Oregon Department of Environmental Quality and the USDA, Forest Service Pacific Northwest Region. OMB 0596-0217, FS-1500-15

[9] Memorandum of Understanding Between United States Department of Interior Bureau of Land Management and the State or Oregon Department of Environmental Quality to Meet State and Federal Water Quality Rules and Regulations. BLM Agreement Number BLM-OR930-1702

			road construction and maintenance standards, road improvements, and decommissioning standards as key elements in protecting soil and water quality.[10] Among the proposed pollution control plans and reports in Appendix A of Part 2 that PCGP presents to avoid or minimize potential water quality impairments are: • Resource Report 6 (Geologic Resources) • Erosion Control and Revegetation Plan • Transportation Management Plan The information below demonstrates how these two plans and this report – with their current information – do not address how PCGP's proposed activities will comply with water quality standards. These two plans and this report lack either the quantitative analysis or engineering analysis and technical support to give DEQ reasonable assurance that PCGP's actions will not contribute to or cause a violation of water quality standards. **Examples of Inadequate Engineering Analysis and Support** **1. Unclear Drainage Management and Storage Activities Adjacent to Potentially Unstable Slopes** In areas where there is a potential for rapidly moving landslides such as the Tyee Core Area, PCGP should avoid certain activities. As recommended by authorities regulating forest management on unstable slopes, PCGP should avoid placing additional weight from (1) construction debris and logging and (2) water onto the upper or mid-scarp areas of unstable slopes such as those associated with: • Convergent headwalls/concave-shaped slopes • Bedrock hollows

[10] Grace III, J.M. and Clinton, B.D. 2007. Protecting Soil and Water in Forest Road Management. USDA Forest Service/University of Nebraska-Lincoln Faculty Publication Volume 50(5):1579-1584. 2007 American Society of Agricultural and Biological Engineers ISSN 0001-2351

			• Inner gorges with steep slopes.[11, 12, 13, 14, 15, 16, 17] In fact, the Oregon Department of Forestry issued rules under the Forest Practice Act that ODF uses to comply with the Clean Water Act requirements such as Total Maximum Daily Loads and to achieve Oregon's water quality standards.[18] Among these FPA rules is a rule OAR 629-625-0330 to ensure forest operations provide a stable forest roads that protect water quality when in use. As discussed in DEQ's review of PCGP's response to Comment 34, PCGP's pipeline right-of-way is functioning as a primitive road. Specifically, this forest road drainage rule for the FPA states: *(1) The purpose of this rule is to provide a drainage system on new and reconstructed roads that minimizes alteration of stream channels and the risk of sediment delivery to waters of the state. Drainage structures should be located based on the priority listed below. When there is a conflict between the requirements of sections (2) through (6) of this rule, the lowest numbered section takes precedence, and the later-numbered and conflicting section shall not be implemented.* *(2) Operators shall not concentrate road drainage water into headwalls, slide areas, high landslide hazard locations, or steep erodible fillslopes.* *(3) Operators shall not divert water from stream channels into roadside ditches.* *(4) Operators shall install dips, water bars, or cross drainage culverts above and away from stream crossings so that road drainage water may be filtered before entering waters of the state.* *(5) Operators shall provide drainage when roads cross or expose springs, seeps, or wet areas.*

[11] State of Washington. Forest Practices Board Manual. Section 16 Guidelines for Evaluating Potentially Unstable Slopes and Landforms
[12] State of Oregon. Landslide Hazards in Oregon. Oregon Department of Geology and Mineral Industries
[13] Jones & Stokes. 2008. Volume I: *Draft Environmental Impact Statement for Elliot State Forest Section 3.2.5 on Slope Stability*. Prepared for U.S. Fish & Wildlife Service and National Marine Fisheries Service.
[14] Report to the 70th Legislative Assembly. 1998. Joint Interim Task Force on Landslides and Public Safety.
[15] Hofmeister, R.J., D. J. Miller, K.A. Mills, J.C. Hinkle, A. Beier. 2002. Text to Accompany the Hazard Map of Potential Rapidly Moving Landslides in Western Oregon. GIS Layer for Local Governments in Implementation of Senate Bill 12. Interpretive Map Series IMS-22. Oregon Department of Geology and Mineral Industries
[16] Sidle, R.C. 1985. *Factors Influencing the Stability of Slopes*. Proceedings of a Workshop on Slope Stability: Problems and Solutions in Forest Management. USDA Forest Service. General Technical Report PN W-180,
[17] Benda, L.E., Veldhuisen, C., Miller, D.J., and Rodgers-Miller, L. 2000. Slope instability and forest land managers: A primer and field guide. Seattle, Wash., Earth Systems Institute, 74 p.
[18] Memorandum of Understanding between the Oregon State Department of Environmental Quality and the Oregon State Department of Forestry. April 16, 1998

(6) Operators shall provide a drainage system using grade reversals, surface sloping, ditches, culverts and/or waterbars as necessary to minimize development of gully erosion of the road prism or slopes below the road.

PCGP has not demonstrated in the Erosion Control and Revegetation Plan or Transportation Management Plan that PCGP will avoid discharging road drainage water into headwalls, slide areas, high landslide hazard locations, or steep erodible fill slopes. Moreover, PCGP has not addressed any of the ODF requirements noted below regarding forest road maintenance. ODF established FPA rule OAR 629-625-0600 to comply with water quality standards by timely maintenance of all active and inactive roads.

DEQ excerpted the following sketches and photographs from technical manuals designed to prevent landslides during forest operations. DEQ used these technical manuals during its desktop analysis of PCGP's proposed actions to identify potential unstable slopes that could initiate debris flows into water bodies. The examples depict convergent headwalls (i.e., concave-shaped slopes) and bedrock hollows. These landscape features can be found adjacent to the proposed PCGP pipeline alignment in numerous locations:

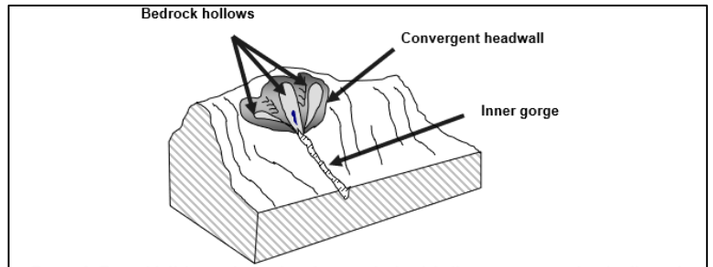


Figure 8. Typical hillslope relationships between bedrock hollows, convergent headwalls, and inner gorges (drawing by Jack Powell, DNR 2003).

Source: Text to Accompany the Hazard Map of Potential Rapidly Moving Landslides in Western Oregon (Hofmeister et al. 2002)

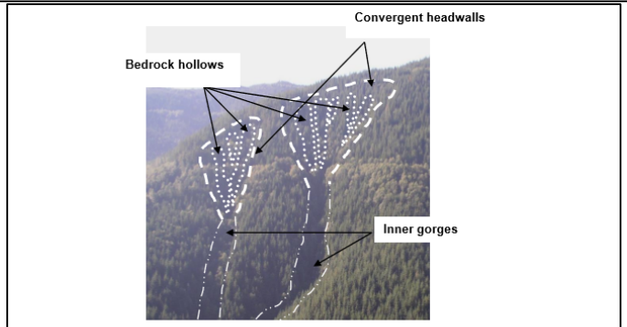


Figure 9. Common hillslope relationship: bedrock hollows in convergent headwalls draining to inner gorges (photo and drawing by Jack Powell, DNR 2003).

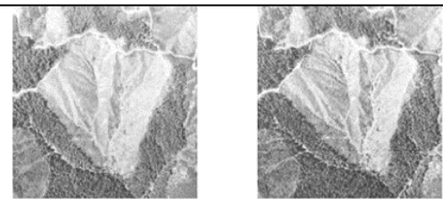
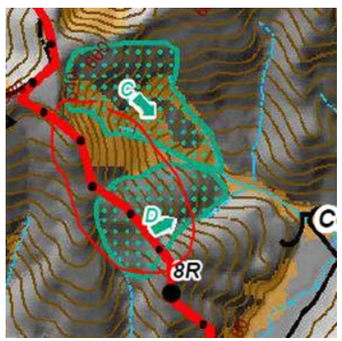


Figure 14a. Stereo pair of a clearcut convergent headwall in Pistol Creek basin, North Fork Calawah River, Washington.

Source: State of Washington Forest Practices Board Manual

These three examples are among many that PCGP can identify when reviewing its Geologic Hazards Map in combination with aerial photos showing the pipeline's right-of-way and other components such as the Temporary Extra Work Areas relative to Areas of Rapidly Moving Landslide Hazard, convergent headwalls, and bedrock hollows. The light brown areas in the excerpt of PCGP's Geologic Hazards Maps are Potential Rapidly Moving Landslide Hazards. The accompanying excerpt of aerial photos show unstable slope features from the Statewide Landslide Information Database for Oregon (SLIDO). These excerpts from the aerial photos also show the pipeline right-of-way (in yellow) and Temporary Extra Work Areas (in light blue).

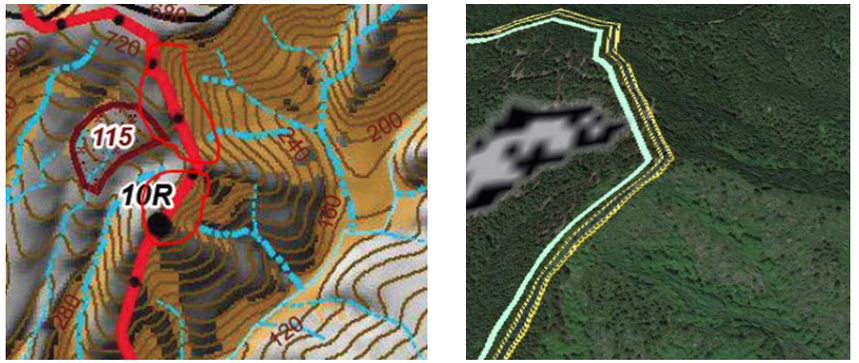
Figure 2 of 47 from PCGP's Geologic Hazards Maps (Northwest of Milepost 8R):





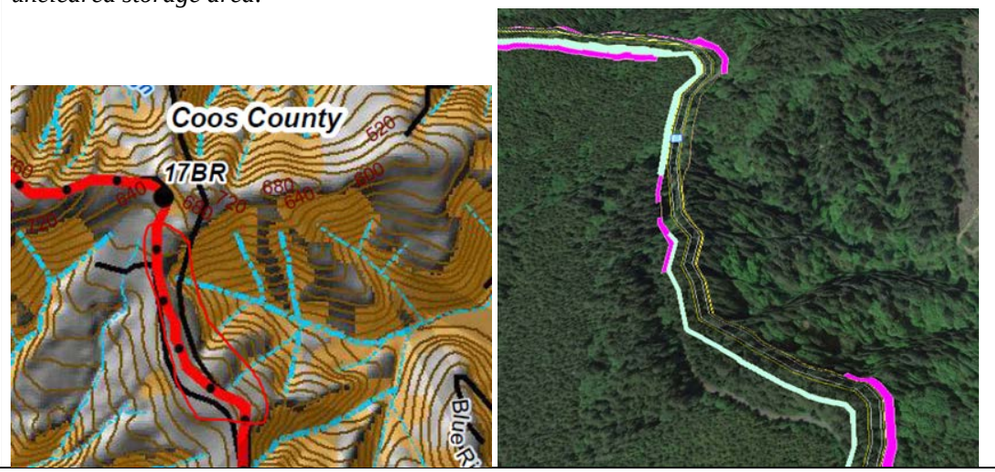
			PCGP's Erosion Control and Revegetation Plan does not indicate if the Temporary Work Area above the unstable slope feature will be used to store spoils (soil, boulders, root wads) and logs from forest clearing. However, PCGP's Resource Report 1 indicates that PCGP may use these work areas for these purposes. The ECRP does not detail how PCGP will manage construction stormwater above this unstable feature. Stormwater discharge at the top of convergent headwalls and bedrock hollow adds load to the top of this unstable slope. This stormwater discharge may create a positive soil pore pressure leading to a landslide. PCGP has not provided DEQ with an engineered post-construction stormwater management plan for the permanent pipeline right-of-way for this area and others indicating how PCGP will manage drainage above unstable slope features. On page 35 of Resource Report 6, PCGP discusses two primary ways in which pipeline construction has the potential to adversely impact slope stability. PCGP notes in Report 6 that routing drainage to potentially unstable slopes has the potential to adversely impact slope stability. However, PCGP does not provide DEQ with an analysis using the slope stability models to identify unstable slopes noted in DEQ's review of PCGP's response to Comments 6 and 7. Additionally, PCGP does not provide DEQ with a construction and post-construction stormwater management plan demonstrating how specifically PCGP will manage stormwater along these unstable landscape features. PCGP only identifies slope breakers along the construction and permanent right-of-way as the only technique to manage construction and post-construction stormwater. PCGP does not discuss, for example, or demonstrate the application of cutoff trenches presented in technical manuals on stabilizing slopes. PCGP does not detail the grade and placement of slope breakers on the ground in engineering plans for the construction and permanent right-of-way. Without this information as well as the drainage pattern, DEQ is unable to determine if the proposed use of slope breakers alone is sufficient to prevent the addition of weight from stormwater and an increase in soil pore pressure on an unstable slope. With the current submittal, DEQ cannot determine if the proposed slope breakers highlighted in the Erosion Control and Revegetation Plan will prevent landslides due to pipeline construction and operation. Additionally, in Resource Report 6 and the proposed ECRP, PCGP does not address site-specific constraints (i.e., roads, unstable landforms on each side of the right-of-way etc.) that may limit the application of slope breakers to route drainage away from unstable slopes. PCGP is proposing to remove trees and shrubs to install this gas pipeline. This loss of tree interception will increase the volume of runoff generated along pipeline's construction and permanent right-of-way. The discharge of this additional runoff among these unstable slope features has the potential to impact water quality. The following are two more examples highlighting similar concerns discussed in DEQ's review immediately above.

Figure 2 of 47 (Northwest and South of Milepost 10R) – Area No. 115 delineated in red is an identified landslide from the Department of Geology and Mineral Industries:



PCGP's ECRP does not show the engineering analysis and its technical support for how PCGP will manage the construction and post-construction stormwater above the Area of a Rapidly Moving Landslide Hazard and convergent headwall as well as the mapped landslide 115 identified by the Oregon Department of Geology and Mineral Industries..

Figure 4 of 47 (Southeast of Milepost 17 BR) – Blue square is a hydrostatic test location while the magenta polygon is an uncleared storage area:



			PCGP's ECRP does not show the engineering analysis and its technical support for how PCGP will manage the construction and post-construction stormwater above the Area of a Rapidly Moving Landslide Hazard and convergent headwall. **2. No Engineering Designs for Fill Slopes on Steep, Unstable Slopes and/or Steep Slopes with Erosive Soils** In Resource Report 6 (Geologic Resources), PCGP provides few specifics regarding controls to stabilize slopes to prevent landslides. Moreover, as noted in DEQ's review of PCGP's response to Comment 35 below, PCGP provides no engineering designs and the technical support for these designs for stabilizing fill slopes on steep, unstable slopes greater than 30% including slopes with highly erosive soils. PCGP identifies this deficiency on page 35 of Section 4.6.2 of Resource Report 6 by stating the following: *Steep side slope Pipeline construction segments will be identified during the final design phase of the Pipeline project. Fill slope construction details and specifications will be designed for the identified steep side slope Pipeline segments.* In Section 11.0 (Steep and Rugged Terrain), PCGP provides only a qualitative description of how it may approach fill slopes on steep, unstable slopes starting at the bottom of page 47. However, this mostly qualitative discussion does not consider terracing on erosive soils nor does it thoroughly address the management of stormwater on a terraced fill slope. The management of drainage on these steep slopes, the use of geotextiles or other engineering techniques to support terracing, and the need to reinforce the toe of slope are also not addressed in PCGP's submittal. These are issues typically addressed in technical references developed to construct linear infrastructure such as roads on steep slopes. However, PCGP does not discuss or addressed these issues in PCGP's submittal. **3. Unclear Design Standards/Specifications for Needed Road Improvements and Maintenance Standards/Specifications for Existing Access Roads** PCGP is proposing to use more than 660 miles of roads to construct this gas pipeline and its associated components. PCGP lists the Transportation Management Plan in Appendix A part 2 of the Water Quality Package as PCGP's approach to comply with water quality standards. As highlighted below, PCGP has not provided DEQ with specific road maintenance standards for access roads PCGP will use to construct and operate the pipeline. As highlighted below, PCGP has not provided DEQ with designs and specifications for any identified improvement to these existing access roads nor has PCGP demonstrated it conducted an inventory of the current condition of all access roads to determine their capacity to support the proposed level of use while minimizing the impact of these access roads on water quality.

			The scientific literature is replete with research documenting the importance of non-paved road design for protecting water quality. There are a number of references providing information on designing stable roads, including improving existing roads, and maintaining non-paved roads to protect water quality.[19, 20, 21, 22, 23] PCGP has not provided DEQ with engineering design details and their technical support for site-specific cut and fill slopes. PCGP has provided no information in the Transportation Management Plan on the improvements to protect water quality that PCGP proposes for existing access roads nor has PCGP presented for DEQ approval the methodology it will use to evaluate the potential water quality impact when using existing access roads given their current condition and design. Requesting that PCGP provide the engineering designs and specifications used to improve roads for pipeline construction and operation is essential for protecting water quality and, at minimum, assuring compliance with water quality standards and, in particular, OAR 340-041-0007(7). As noted in DEQ's review of PCGP's response to Comment 15, the scientific literature is replete with research documenting the importance of routine road maintenance for protecting water quality. For example, routine road maintenance for water quality is important to maintaining water quality necessary for the recovery of salmonids listed under the Endangered Species Act and found in streams receiving runoff from PCGP's proposed access roads. The National Marine Fisheries Service issued the Limit 10 Section 4(d) rule concerning routine road maintenance to protect water quality for ESA-listed salmon. For decades, the scientific community has established the harmful effects of roads on streams.[24] DEQ is requesting that PCGP provide the specific maintenance standards PCGP will apply to access roads while in use for pipeline construction. As discussed above, this is essential for protecting water quality and, at minimum, assuring compliance with water quality standards and, in particular, OAR 340-041-0007(7). Additionally, the Oregon Department of Forestry has rules for road maintenance and road building on private forest roads. ODF developed these rules to address public safety and water quality given the risk of landslides, road failure, and sediment discharge from road use and construction.[25, 26, 27, 28] ODF uses road maintenance and building requirements associated with the Forest Practices Act to comply with Clean Water Act requirements such as those associated with Total Maximum Daily Loads and water quality standards. However, PCGP does not provide DEQ with information on how

[19] Choctawatchee, Pea, and Yellow Rivers Watershed Management Authority. 2000. Recommended Practices Manual – A Guideline for Maintenance and Service of Unpaved Roads
[20] Berkshire Regional Planning Commission. 2001. The Massachusetts Unpaved Roads BMP Manual – A Guidebook on How to Improve Water Quality While Addressing Common Problems
[21] Gordon Keller and James Sherar. 2003. Low-Volume Roads Engineering – Best Management Practices Field Guide. US Agency for International Development and USDA Forest Service
[22] R. Jonathan Fanin and Joachim Lorbach. 2007. Guide to Forest Engineering in Mountainous Terrain. Forestry Harvesting and Engineering Working Paper 2. Food and Agricultural Organization of the U.N.
[23] Hearn, G.J. 2011. Slope Engineering for Mountain Roads. Geological Society Engineering Geology Special Publication No. 24
[24] Furniss, M.J., T.D. Roelofs, and C.S. Yee. 1991. Road Construction and Maintenance. American Fisheries Society Special Publication 19:297-323
[25] Oregon Department of Forestry. 2003. *Wet Weather Road Use*. Forest Practice Technical Note Number 9
[26] Oregon Department of Forestry. 1999. *Road Maintenance*. Forest Practices Technical Note Number 4
[27] Oregon Department of Forestry. 2003. *Installation and Maintenance of Cross Drainage Systems on Forest Roads*. Forest Practice Technical Note Number 8
[28] Oregon Department of Forestry. 2003. *High Landslide Hazard Locations, Shallow, Rapidly Moving Landslides and Public Safety*: Screening and Practices. Forest Practice Technical Note Number 2

			specifically PCGP will address OAR 629-625-0700 (Wet Weather Road Use). ODF's Wet Weather Road Use rule requires the following: *…durable surfacing or other effective measures to resist deep rutting or the development of a layer of mud on top of the road surface on road segments that drain directly to streams that will be used for log hauling and moving construction equipment during wet periods.* In its Forest Practices Technical Note 9, ODF provides a discussion of aggregate surfacing, road use, and turbidity in streams. DEQ can find no information in any of the plans included in PCGP's analysis of its compliance with water quality standards that addresses the issues raised in this ODF technical note and in Forest Practices Act rules. Moreover, for public safety, under OAR 629-623-0000 – 0800, a forest harvesting operator must submit to ODF a detailed road design for all new or reconstructed roads crossing high landslide hazard locations. For water quality protection and compliance with OAR 340-041-0007(7), DEQ is requesting in Comment 31 that PCGP provide detailed road designs for new or reconstructed roads in landslide hazard areas and other locations where these roads are hydrologically connected to waters of the state. PCGP must demonstrate in its plans and supporting documents where and when exactly PCGP is applying these designs on the proposed access roads for pipeline construction and operation. As with ODF's requirements for private forest roads, Counties have authority to establish road construction designs and specifications for County roads.[29] At minimum, these county requirements will ensure that an unpaved county road will support PCGP's proposed level of use while protecting the stability of the road surface and, consequently, water quality for roads hydrologically connected to waters of the state. In its proposed Transportation Management Plan, PCGP has not identified any maintenance standards as well as design and specifications for reconstructed County roads used as access roads. Additionally, PCGP has not provided DEQ with Forest Service, Bureau of Land Management, and Bureau of Reclamation road permits roads containing maintenance standards and design and specifications for reconstructed federal roads proposed by PCGP for use as access roads. These road permits must provide PCGP with clear and enforceable standards and specifications. The following is an example of the maintenance standards PCGP has proposed in its Transportation Management Plan in Section 2.2.2: *PCGP will perform or make commensurate share payment(s) for maintenance on existing Agency roads used during construction and any subsequent non-casual use in accordance with USDA-FS Manual Chapter 7730, the USDA-FS Handbook section 7709.59, Chapter 60, BLM Manual 9100 Series and the various BLM District Resource Management Plans and as shown*

[29] Association of Oregon Counties. 2014. Chapter 13: Design and Specification for Roads. County Road Manual

			in TMP Appendices C1, C2, C3, D, and D1. *Existing Agency-jurisdiction Roads will be maintained to ensure compliance with any applicable Road Use Permit, Reclamation standards for "Engineering and O&M Guidelines for Crossings" (Exhibit H of the Grant and TUP), the Grant and TUP, this TMP and in consultation with the Agencies regarding current standards for the maintenance level identified for the Road(s). Roads constructed by PCGP on Agency lands will be maintained to standards approved by the Agency.* *To facilitate consistency across the Pipeline Project, Agencies have agreed to utilize the most current USDA-FS, Pacific Northwest Region (Region 6), standard timber sale road maintenance specifications ("T-specs") and Pipeline Project specific supplemental specifications as appropriate. Agency Roads requiring PCGP maintenance and associated specifications are shown on maps in TMP Appendices B and B1 and in tables in TMP Appendices C, C1, C2, C3, D, and D1. Copies of the specifications are available from the Supervisor's Office of any National Forest in Region 6.* *Paved Roads will be kept free of mud and other debris that may be deposited by construction equipment. Track-driven equipment would cross paved Roads on tires or equipment pads to minimize Road damage. Any paved, gravel, or dirt roadways damaged by construction activities will be repaired to a condition equal to or better than the condition prior to damage. Agencies may require PCGP to provide selected pre-use Road and/or sign condition surveys, including photos or video, to aid in assessing use-induced changes.* Similarly, in Section 2.2.3, PCGP proposes road improvements to accommodate equipment for pipeline construction and roads slated for improvements are described in: *TMP Appendices B and B1 maps* *TMP Appendices C, C1, C2, C3, and D1 tables* However, PCGP has provided no information in Appendices B, B1, C1, C2, C3, D, and D1 as PCGP has left these pages in the Transportation Management Plan blank. PCGP indicates in the excerpt above that PCGP will maintain existing "Agency-jurisdiction Roads" to ensure compliance with any applicable road use permit and other standards. However, PCGP provides no road permits for DEQ to review nor any applicable road maintenance standards and specifications for all the access roads. In DEQ's Comment 15, DEQ requests that PCGP provide supporting documents such as design standards and road permits that PCGP will use when complying with TMDL Implementation Plans such as Federal Water Quality

			Restoration Plans. However, in PCGP's response to DEQ's Comment 15, PCGP indicates that Right-of-Way Grants will ensure compliance with water quality plans. DEQ disagrees with this assertion and provides the rationale for this disagreement in DEQ's review of PCGP's response to Comment 15. Moreover, the statement below from PCGP's Transportation Management Plan undermines this assertion regarding right-of-way grants. In the TMP, PCGP states that roads "will be maintained to ensure compliance with any applicable Road Use Permit." Although PCGP intends to use compliance with applicable road use permits to comply with water quality standards and, therefore, obtain a 401 Water Quality Certification, PCGP does not consider road use permits essential for demonstrating compliance with a Total Maximum Daily Load. Additionally, in the excerpts from PCGP's Transportation Management Plan above, PCGP does not provide the actions it will take to maintain Coos, Douglas, Jackson, and Klamath County and private forest roads that PCGP will use to access pipeline right-of-way for construction and operation. What are the County road maintenance standards that PCGP will follow? For private forest roads used to haul harvested trees, Oregon Department of Forestry has issued a road drainage rule to implement the Forest Practices Act.[30] As noted above, ODF uses the FPA and its administrative rules to regulate road maintenance for water quality and compliance with the Clean Water Act and, in particular, water quality standards. ODF requires the operator of private forest roads used for forest harvesting to install additional drainage such as cross drains where needed to filter stormwater from roads to protect water quality. In ODF's Technical Note Number 8 referenced above, ODF provides technical guidance to address ditch erosion and the sediment it produces. Specifically, ODF presents typical minimum culvert spacing for erosion control in a roadside ditch. As the grade of a road increases, this drainage becomes increasingly important. In OAR 629-625-600(9), ODF requires the following: *Where needed to protect water quality, as directed by the State Forester, operators shall place additional cross drainage structures on existing active roads within their ownership prior to hauling to meet the requirements of OAR 629-625-0330.* PCGP must determine in collaboration with ODF the need for additional cross drainage structures prior to using access roads for pipeline construction and operation. As discussed above, PCGP must include this determination as well as the evaluation of the current condition and design of existing access roads in its submittal for Water Quality Certification. DEQ will review this information when developing the Certification Decision. Additionally, in its Transportation Management Plan excerpted above, PCGP does not indicate specifically how PCGP will keep paved roads free of mud and other debris PCGP may deposit with its construction equipment. How specifically will PCGP keep paved roads free of mud and other debris? What BMPs will PCGP use to implement this stated goal? Will PCGP operate a wheel wash station at access road crossings with the construction right-of-way? DEQ cannot fully evaluate

[30] Oregon Department of Forestry. 2003. Installation and Maintenance of Cross Drainage System on Forest Roads. Forest Practices Technical Note Number 8 (Version 1.0)

			the efficacy of the proposed Transportation Management Plan on general statements unless PCGP follows these statements with specific practices applied to specific locations with a schedule identifying when PCGP will implement these practices. In PCGP's Transportation Management Plan excerpted above, PCGP has not provided road permits showing maintenance standards that DEQ can review. PCGP has not provided DEQ with proposed "T-specs" to review nor demonstrated that these "T-specs" will comply with County and ODF Forest Practice Act requirements developed to comply with Clean Water Act requirements. As requested in Comment 23 and 24, PCGP has not identified access requiring maintenance and improvements to protect water quality nor standards and specifications noted in the Transportation Management Plan excerpt above. Additionally, PCGP has not provided maintenance specifications for Forest Service roads. As noted in DEQ's Comment 15 and Comment 29, DEQ must ensure compliance with Section 303 of the CWA and other appropriate requirements of state law in developing its Certification Decision. To protect water quality and to comply with water quality standards such as OAR 340-041-007(7), PCGP must design needed access road improvements to ensure these improvements do not cause landslides. Moreover, PCGP must maintain access roads to prevent water quality impacts during logging truck and heavy equipment traffic. Regarding any proposed improvements to proposed access roads, PCGP provides few details that DEQ can use to evaluate the efficacy of proposed controls to prevent erosion and sedimentation. For DEQ's concerns regarding slope stability and the construction and operation of the pipeline, DEQ can find only the following information in Section 3.5 of the Transportation Management Plan: *Refer to Slope Stability Stipulation D.20 of the Grant and TUP.* PCGP has not provided the Grant (Right-of-Way Grant, Serial No. OR 63542-01) and the TUP (Temporary Use Permit, Serial No. OR 63542) for DEQ to review to determine if the grant and permit contain enforceable details regarding road maintenance and improvements. Our review of the "Grant and TUP" is essential for the development of the Certification Decision and determining PCGP's compliance rules for developing this decision as stated in OAR 340-048-0042. Given the above, DEQ is unable to determine what this "Slope Stability Stipulation" entails and how PCGP will respond to it. PCGP's Introduction in Section 1.0 of the Transportation Management Plan states that this plan: *…includes details regarding timber removal and construction access Road improvements, Road maintenance and management of use before, during, and after construction. A final TMP will be submitted by PCGP to the Agencies for approval prior to issuance of the TUP and Grant. This TMP applies to Agency-jurisdiction Roads located on Agency and privately-owned land.* To date, PCGP's Transportation Management Plan does not contain and PCGP has not provided DEQ with any detailed information in engineering plans on how and where exactly PCGP will perform road improvements to prepare the proposed

			access roads for their proposed use and to protect water quality. In the Transportation Management Plan, PCGP also states the following: *…where construction schedules require Road use outside the normal operating season, more substantial work such as surfacing or resurfacing of may be necessary.* The season of rainfall is typically from mid-October to mid-July. Timber and ridgetop removal as well as heavy equipment access for pipeline construction are levels of use that have the potential to generate sediment discharge to receiving waters if the non-paved roads are not reconstructed and maintained to support this proposed use during the season of rainfall. To date, PCGP has not provided DEQ with a road maintenance plan for all access roads to ensure that during the season of rainfall road use will not impact water quality. PCGP states in its Transportation Management Plan that: *All maintenance and improvements will be completed in accordance with Pipeline Project requirements and Agency, state, county and private landowner standards.* PCGP has not provided DEQ with any information on road maintenance standards and road improvement design standards in this Transportation Management Plan or any other document PCGP included in it 401 Water Quality Certification Submittal. In Section 2.2.1 of PCGP's Transportation Management Plan, DEQ states the following: *PCGP will be responsible for performing Road maintenance on all newly constructed Roads on Federal Lands and decommissioning of temporary Roads as specified in this plan.* PCGP has not presented in this plan any road decommissioning standards. Rather, PCGP only provides the following information and references to documents that are currently unavailable to DEQ: *TARs and previously decommissioned Roads that are constructed or reconstructed for use during the Pipeline Project will be reclaimed or decommissioned as specified by the Agency. In addition, as mitigation for impacts to various late-successional and riparian-dependent species as well as soil productivity losses, PCGP proposes to decommission off-site Roads in cooperation with the Agency in accordance with Agency specifications and the Compensatory Mitigation Plan (Exhibit G, Appendix CC to the Grant and TUP).*

			As noted in the USDA Forest Service's review of the science regarding road construction and maintenance, unmaintained roads are a substantial source of sediment delivery to streams in forest watersheds.[31] Given this and other research on water quality impacts from road design and maintenance, DEQ requested information in AIR-1 on road decommissioning to develop its Certification Decision. Although PCGP provides a definition of decommissioning in Appendix E of the Transportation Management Plan, PCGP does not indicate in this plan what roads PCGP will decommission nor provide detailed management practices and design standards that PCGP will employ at each decommissioned road segment. DEQ requested this information in Comment 28 of AIR-1. The definition of decommissioning used in PCGP's Transportation Management Plan indicates that treatments may include stabilizing slopes, pulling back road shoulder, removing unstable road fills, or installing water bars. How will PCGP carry out these treatments at each site to ensure roads on landslide prone, steep slopes are not destabilized further? Does stabilizing slopes refer to unstable cut slopes if the road prism is left in place? If so, what are PCGP's proposed designs for stabilizing unstable cut slopes? If PCGP uses slope breakers or water bars to manage stormwater on a decommissioned road surface, who will maintain this system for managing stormwater and are there financial resources to maintain this system for the operational life of this pipeline? PCGP has not demonstrated to DEQ that it has thought through the details of decommissioning road segments to protect water quality.
16	In addition, please identify all proposed amendments to federal land and resource management plans that would necessitate amendments to current Forest Service, Bureau of Land Management, or Bureau of Reclamation Total Maximum Daily Load Implementation Plans covering the pipeline's construction and operation. Federal Water Quality Restoration Plans represent the Forest Service's and BLM's plan for activities on these federal lands serving as a source of point and nonpoint source pollutants including	The Forest Service provided in a Notice of Intent a preliminary list of plan amendments required for the pipeline in Federal Register 27473 (June 15, 2017). In this notice of intent, BLM reviewed the proposed route and determined plan amendments required to accommodate the pipeline including changes to right-of-way Avoidance Areas where the pipeline would cross. BLM indicated that it will identify additional pathways via scoping or further analysis and that minor design modifications are needed for conformance with approved	**Summary Statement: DEQ requests that the Federal agencies not proceed with proposed amendments to land management plans until DEQ can determine how these changes may affect the Federal agencies' compliance with existing Total Maximum Daily Loads. DEQ makes this request so that DEQ can develop a Certification Decision in compliance with OAR 340-048-0042(2). In the section below, DEQ provides examples how these proposed plan amendments currently undermine Federal agency compliance with TMDLs.** **The proposed plan amendments to allow additional soil compaction suggest the surface of the proposed permanent right-of-way will have increased runoff similar to that of a primitive road. As such, DEQ requires PCGP to provide a quantitative assessment of the post-construction stormwater discharge from the permanent right-of-way at all stream crossings. This assessment should demonstrate this stormwater discharge complies with water quality standards. PCGP must also include design information for all stormwater treatment controls used at these stream crossings as requested in DEQ's submission guidelines for post-construction stormwater management. In Comment 34 of AIR-1, DEQ requested this information, but PCGP has not yet provided it.** **The BMPs and plans noted in PCGP's response do not fully address the Erosion and Sediment Control Plan requirements of a NPDES 1200-C General Permit. In the section below, DEQ details its concerns and the specific information DEQ is seeking in Comment 16 as well as the rationale for the information requested in this comment.** **1. Proposed Federal Land Use Plan Amendments**

[31] Furniss, M.J., T.D. Roelofs, and C.S. Yee. 1990. Road Construction and Maintenance. American Fisheries Society Special Publication 19:297-323

	pollutants addressed in a Total Maximum Daily Load.	plans. Four streams are proposed and presented for dry open cut crossings on Federal lands. Appendix A to Part 2 of the JPA details BMPs and plans PCGP to avoid and minimize effects to water quality when constructing waterbody crossings.	Federal Register 27473 (June 15, 2017) does not contain the information presented in JCEP's response to DEQ comments. Given this, DEQ cannot verify the information provided and requests that Jordan Cove provide the correct Federal Register citation. Although not referenced in JCEP's response to comments, Federal Register 28837 (June 26, 2017) presents proposed amendments to Federal land and resource management plans associated with PCGP's proposed gas pipeline construction. The proposed land and resource management amendments listed below may lead to amendments of the Forest Service's Total Maximum Daily Loads Implementation Plans referred to as Water Quality Restoration Plans. Changes to the Forest Service's Water Quality Restoration Plans may affect compliance with TMDLs. For example, proposed amendments entitled UNF-1, UNF-2, RRNF-5, and WNF-5 affecting effective shade and riparian areas may affect compliance with a temperature load allocation in a TMDL. For this reason, DEQ requests that proposed amendments to Forest Service land and resource management plans not proceed until PCGP has provided DEQ the information requested in Comment No. 19. In particular, DEQ request information on PCGP's effort to first avoid, then minimize and, if unavoidable, mitigate impacts to shade in riparian areas. DEQ also requests more information regarding BLM's proposed Resource Management Plan amendments to (1) make changes to land use allocations along the pipeline route and (2) make changes to right-of-way Avoidance Areas to determine if these areas contribute to the implementation of or alter BLM's Water Quality Restoration Plans. Water Quality Restoration Plans are the Forest Service's and BLM's TMDL Implementation Plans. **Umpqua National Forest** The following two proposed plan changes below are relevant to DEQ concerns regarding TMDL compliance: (1) effects of proposed amendments on Riparian Reserves and (2) detrimental soil conditions from the project. • Amendment (UNF-2) would allow the pipeline to run parallel to the East Fork of Cow Creek for .1 mile between MP 109.5 and 109.6 and will impact 1 acre of riparian vegetation. • Amendment (UNF-3) would remove for this proposed project established limits for soil compaction (i.e., no more than 20% allowed of the project area). This proposed amendment supports DEQ's concern and request in AIR-1 (see Comment 34) for a (1) post-construction stormwater management plan for the permanent right-of-way particularly as it discharges to streams and (2) for modeling to evaluate the impact of this discharge. The proposed amendment also supports DEQ's concern raised in AIR-1 regarding the impacts to riparian vegetation and the shade it provides streams with PCGP's proposal to use FERC guidelines that allow clearing for the pipeline alignment within 15 feet of a water body. This information in the proposed amendment supports the need for PCGP to address DEQ's Comment 32. **Rogue National Forest**

			Two of these proposed changes below are relevant to DEQ's concerns and both involve soil compaction. One area of soil compaction is in a restricted riparian area and the other is in all management areas. • Amendment (RRNF-5) potentially affects approximately 2.5 acres of the Restricted Riparian Management Strategy at one perennial stream crossing on South Fork of Little Butte Creek around MP 162.45. • Amendment (RRNF-6) would exempt PCGP from the requirement to limit soil compaction to 10% of the activity area (not including permanent roads or landings) upon completion and to limit soil compaction to no more than 20% from management practices. This proposed amendment supports DEQ's concern and request in AIR-1 (see Comment 34) for a (1) post-construction stormwater management plan for the permanent right-of-way particularly as it discharges to streams and (2) for the modeling of this impact of this discharge. **Winema National Forest** Two of these proposed changes below are relevant to concerns raised in DEQ's comments in AIR-1 and both involve soil compaction. This soil compaction is in all management areas and the other involves a specific riparian area. • Amendment (WNF-4) would exempt PCGP in all management areas from the requirement to limit soil compaction to 20% of the activity area. This proposed amendment supports DEQ's concern and request in AIR-1 (see Comment 35) for a (1) post-construction stormwater management plan for the Permanent ROW particularly as it discharges to streams and (2) for the modeling of this impact of this discharge. • Amendment (WNF-5) would exempt PCGP in Management Area 8. Management Area 8 is a riparian area where the pipeline affects approximately .5 mile or an estimated 9.6 acres of this particular management area and where the limit to soil compaction is 10% of the total riparian zone. Given the information in the Federal Register notice, DEQ cannot determine if the extent of potential water quality impacts are limited to soil compaction or riparian vegetation removal or both. DEQ requests that PCGP clarify the extent of potential water quality impacts associated with this proposed plan amendment for the Winema National Forest. Considering the proposed amendments above, DEQ has concerns with soil compaction's influence on the movement and volume of stormwater on the landscape and, ultimately, its erosive force over the landscape and potential to cause hydromodification in streams. Given the documentation in the Federal Register citation above, the operation of the gas pipeline will result in permanent soil compaction and this soil compaction will exceed the level permitted in the Forest Service's current land management plan. As a result, to evaluate compliance with OAR 340-041-0007(1), DEQ is

			requesting that PCGP submit for DEQ's review and approval a soil compaction monitoring plan clearly delineating the following: • Area of the right-of-way that PCGP will address soil compaction. • Area of the ROW where soil compaction will occur to support the operation of the pipeline. This monitoring plan must identify all the locations where PCGP will evaluate soil compaction from construction activities and include the methodology selected for soil compaction testing and quality assurance measures to support the accuracy and precision of soil compaction measurements. **2. BMPs and Plans to Avoid and Minimize Water Quality Impacts to Water Body Crossings** BMPs in Waterbody Crossing Plans and Figures in Resource Report 2 Appendix E.2 referenced in PCGP's response to DEQ's Comment 16 lack specific information required in, for example, the NPDES 1200-C General Permit's Schedule A.12.b.v. Compliance with this permit schedule will help demonstrate that PCGP will implement specific controls to avoid and minimize effects to water quality during the development of these water body crossings. The general description of BMPs excerpted below and referenced in PCGP's response when referring DEQ to PCGP's Wetland and Waterbody Crossing Plan will not comply with the NPDES 1200-C General Permit: *…Sediment barriers will be installed immediately after clearing and prior to initial ground disturbance (i.e., grading). Sediment barriers will be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete and revegetation has stabilized the disturbed areas…* To evaluate the efficacy of proposed BMPs to control pollutant discharge during the construction of all waterbody crossings, DEQ requests that PCGP include in its permit application for a NPDES 1200-C General Permit the information requested in Schedule A.12 including the Site Map and Drawings for all waterbody crossings. DEQ also requests that PCGP propose a model to demonstrate quantitatively that the application of these construction BMPs will not cause or contribute to a violation of in-stream water quality standards. This analysis is needed to comply with NPDES 1200-C General Permit Schedule A.10.a and OAR 340-048-0042(2)(a).
17	Finally, for determining compliance with TMDL allocations covering federal lands, please provide for DEQ's review and approval all proposed Forest Service,	PCGP submitted an application to BLM, Forest Service, and BOR for issuance of a right-way-grant across federal lands including a plan of development containing BMPs	**<u>Summary Statement</u>: The information provided in Federal agency road permits and access/right-of-way grants is critical to the process of developing a Certification Decision given its potential to protect water quality. DEQ is requesting that PCGP provide DEQ with drafts of all federal agency road permits and access/right-of-way grants to review and, if necessary, request modifications and/or additions to these permits/access grants/right-of-way grants. DEQ provides the rationale for this information request in the section below and the level detail it expects in a future response to Comment 17.**

	Bureau of Land Management, and Bureau of Reclamation road permits and access grants or right-of-way permits.	and PCGP commitments during and after construction. PCGP will provide a revised Table A.2-6 from Appendix A.2 of Resource Report 2. This revised table will identify BMPs for waterbodies crossed by or within 100 feet of the pipeline.	PCGP's response to Comment 17 did not address DEQ's request to review and approve road permits from Federal agencies that support or will support Federal agency compliance with Section 303 of the Clean Water Act. DEQ presents the rationale for requesting this information in DEQ's review of PCGP's response to Comment 15 provided above and to Comment 17 below. In summary, the intent of DEQ's information request in Comment 17 is to determine if the practices in these permits and right-of-way grants will protect water quality and, for example, comply with Total Maximum Daily Loads. As part of the 401 Certification process, DEQ will need to review and – if needed – request changes and/or additions to the conditions in road permits for Federal road and access/right-of-way grants to use Federal lands. This request supports DEQ's compliance with rules governing the development of a certification decision [OAR 340-048-0042(2)]. This request will also contribute to Federal agency compliance with the Presidential Order to coordinate environmental review and permitting.[32] To obtain an access or right-of-way grant from the Forest Service, PCGP must submit an application for a special-use authorization. In applying for this authorization, PCGP will submit with other information an environmental protection plan including actions to ensure environmental protection and rehabilitation during construction and maintenance of the gas pipeline.[33] The Forest Service uses the information in this required environmental protection plan to develop the right-of-way grant for PCGP. DEQ is seeking to review the environmental protections included in this grant to evaluate their efficacy in protecting water quality and complying with Federal agency programs for compliance with Total Maximum Daily Loads. PCGP's response to Comment 17 indicates that PCGP is providing Federal agencies with the same information PCGP provided DEQ in its submittal for a Section 401 Water Quality Certification. At this point in DEQ's review of PCGP's submittal, PCGP has not provided documents containing site-specific information such as plans with drawings and specifications identifying best management practices on the landscape designed to prevent water quality impacts. PCGP has provided some generic drawings and best management practices along with limited information in the narrative of plans included in its submittal as noted in elsewhere in this DEQ review. However, these generic drawings do not address site-specific landscape constraints such as fill and cut slopes on steep and, in many cases, unstable slopes (e.g., potential Areas of Rapidly Moving Landslide Hazards) and/or soils with a high erosion potential. These generic drawings do not provide the engineering designs and the technical support for these designs to demonstrate to DEQ that PCGP has considered these challenging landscape constraints and developed engineered solutions to protect water quality. Given the information provided in PCGP's Transportation Management Plan, DEQ anticipates PCGP will seek a road permit or similar authorizations to use Federal roads to build and operate the pipeline. These road permits or authorizations will contain conditions specifying how PCGP will use and maintain these existing roads. For example, Federal road permits may contain conditions specifying design standards for road improvements, road reconstruction, and/or road maintenance

[32] Presidential Executive Order. August 15, 2017. Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure

[33] USDA Forest Service. Obtaining a Special-Use Authorization with the Forest Service – The Application Process

			standards from handbooks, manuals, or other technical documents these Federal agencies use to implement their Water Quality Restoration Plans (Forest Service and BLM) or will use to implement their TMDL Implementation Plans (BOR). Federal agencies develop these plans to meet allocations for Total Maximum Daily Loads. Federal agencies may require in a road permit that PCGP address specific maintenance standards prior to, during, and after pipeline construction.[34] Many of these standards will protect water quality while preparing the road for its intended use as noted elsewhere in DEQ's review of PCGP's response to AIR-1. For example, the Forest Service provides the following direction in its Forest Service Handbook regarding the required road maintenance work prior to using National Forest road: *Prehaul work must be accomplished prior to commercial hauling to make a road suitable and safe for commercial use as well as any other anticipated traffic, such as recreation use. Prehaul maintenance includes such activities as surface blading, ditch and drainage maintenance, slide and slough removal, brush removal, and road opening. It does not include reconstruction work.*[35] Prehaul work that establishes, for instance, a durable surface on nonpaved roads will protect water quality and, therefore, are relevant to the development of DEQ's Certification Decision. This handbook also addresses road damage and extraordinary repairs as follows: *Commercial road users are responsible for repairing road damage caused by their operations or by their failure to perform proper or timely maintenance. The Forest Service is responsible to repair damage caused by noncommercial use, provided the commercial user has complied with contract or permit requirements for placement and operation of traffic control devices.* *Extraordinary repairs involve physical blockage or loss of the roadbed or its structures, damage that cannot be corrected by routine maintenance equipment (such as end loaders, graders, backhoes, and dump trucks) operating from the level of the roadbed. This is work that is outside the scope of maintenance specifications or that requires additional engineering drawings or design. To this, forests may add further definitions that fit their particular situations. Extraordinary repairs will generally be handled as reconstruction.* Such road repairs are critical to protect water quality as noted elsewhere in DEQ's review of PCGP's response to AIR-1. These road repairs will help ensure compliance with water quality standards while PCGP uses access roads for pipeline construction and operation. Consequently, in developing its Certification Decision, DEQ needs assurances that the road maintenance and reconstruction standards and specifications are required when PCGP uses a Federal access road. As a condition of using a federal road, DEQ also wants assurances in PCGP's submittal that PCGP will execute site-specific

[34] Ruiz, Leo. 2005. Guidelines for Road Maintenance Levels. USDA Forest Service. Technology & Development Program 7700-Transportation Management o577 1205-SDTDC

[35] USDA Forest Service. 2003. Chapter 10 – Maintenance of Forest Development Roads. Forest Service Handbook 7709.58 (Transportation System Maintenance Handbook. R6 Supplement FSH-7709.58-2003-1

			actions to prevent and, if necessary, quickly address road damage as it arises. Moreover, for example, the Forest Service Handbook in Section 12.42 (Region 6 Supplement) on Maintenance Standards references performance-based road maintenance specifications covering maintenance issue relevant to water quality protection such as: • Surface maintenance • Surface stabilization • Drainage Structure installation or removal • Roadway drainage system maintenance • Disturbed area treatment • Roadway vegetation maintenance[36] At minimum, such specifications provide verifiable indicators or measures of compliance with the Forest Service's road maintenance standards. As documented in this DEQ review of PCGP's response to AIR-1, road maintenance is critical for water quality protection. Consequently, DEQ is seeking these verifiable measures of compliance as it develops its Certification Decision. More importantly, these specifications provide DEQ assurance the Forest Service – a Designated Management Agency under a TMDL – can enforce compliance with maintenance standards and, if needed, suspend work until the permitted or authorized entity such as PCGP achieves compliance when using a Forest Service road. In its effort to ensure compliance with the conditions of a Certification Decision, for example, DEQ may request that the Forest Service use their authority to suspend work until PCGP restores the condition of the Federal road to protect water quality. As PCGP is revising its submittal to provide DEQ with more specific information regarding PCGP's practices on access road and in the pipeline right-of-way, DEQ is requesting the level of detail in PCGP's response provided in the examples above for all proposed maintenance and reconstruction actions on Federal, County, and private roads. If PCGP chooses to revise Table A.2-6 from Appendix A.2 of Resource Report 2 in response to Comment 17, then DEQ anticipates receiving from PCGP the level of detail highlighted in DEQ's review above regarding right-of-way or access grants and road permits. Moreover, as noted elsewhere in DEQ's review, DEQ will not accept PCGP's arbitrary decision to focus BMPs on waterbodies crossed by or within 100 feet of the pipeline. PCGP must apply all BMPs to protect water quality to all access roads and the pipeline's construction and permanent right-of-way hydrologically connected to water bodies. To determine objectively hydrologic connectivity of access roads and the right-of-way, PCGP can use Geomorphic Road Analysis and Inventory Package (GRAIP) or a comparable analytical tool approved by DEQ.
18	Provide for DEQ's review and approval all proposed easements, agreements, and access or right-of-way permits for non-federal lands.	PCGP is working with private stakeholders to secure proposed easement and access or right-of-way permits. PCGP will provide a revised Table	**Summary Statement: OAR 340-048-0020(3) authorizes DEQ to request and receive information necessary to review and evaluate applications for section 401 water quality certification. DEQ considers access to all locations of the proposed project both reasonable and necessary to fulfill our Clean Water Act obligations. For this reason and as more fully discussed in the following section, DEQ is requesting copies of all proposed easements, agreements, and access or right-of-way permits for non-federal lands.**

[36] USDA Forest Service. 2007. Performance Based Road Maintenance Specifications. Transportation System Operations and Maintenance. Pacific Northwest Region

		A.2-6 from Appendix A.2 of Resource Report 2 that will identify BMPs for waterbodies crossed by or within 100 feet of the pipeline. Private agreements are not prerequisites for issuing a 401 WQ Certification.	As discussed elsewhere, DEQ will require a site-specific analysis of existing water quality, project-related effects, and a technically supported analysis of proposed engineering measures to mitigate for project-related effects. Revisions to Table A.2-6 must provide site-specific support for these proposed measures. Moreover, DEQ questions PCGP's proposal to focus BMPs on water bodies crossed by or within 100 feet of the pipeline. BMPs are required to protect water quality from impervious surfaces throughout all portions of the construction and permanent right-of-way that are hydrologically connected to water bodies. To determine the hydrologic connectivity of access roads and the right-of-ways, PCGP can use Geomorphic Road Analysis and Inventory Package (GRAIP) or a comparable analytical tool approved by DEQ. DEQ requires review and approval of all private easement agreements to assess potential impacts to water quality. DEQ seeks information how PCGP will use and maintain non-federal access roads and manage stormwater as well as other sources of pollutant discharge during construction and operation of the pipeline under all easements, agreements, and access/right-of-way permits on non-federal lands. DEQ is making this information request Comment 18 to ensure that all proposed easements, agreements, and access or right-of-way permits for both non-Federal and Federal lands will implement PCGP's proposed BMPs included in its submittal comply – for example – with TMDLs. To date, PCGP has not provided DEQ with the conditions, engineering designs/specifications, and/or requirements attached to private agreements to secure access to private lands for pipeline construction and operation. To develop a Certification Decision, DEQ must review and – if needed – request changes/additions to these conditions, engineering designs/specifications, and/or requirements in its efforts to evaluate compliance with water quality standards.
19	This compliance assessment must also include a summary of the steps taken to first avoid and then minimize impacts to the Designated Management Agency's riparian buffer protection areas prior to: • Siting Temporary Extra Work Areas for the pipeline construction • Siting of the construction and the permanent right-of-way for the pipeline.	PCGP will provide a response to DEQ in Q4 of 2018.	DEQ anticipates PCGP's response in Q4 2018.

	DEQ is requesting this information in response to Pacific Connector Gas Pipeline's proposal to locate TEWAs 50 feet from a waterbody and wetland boundary (see page 25 of Resource Report 1 for the gas pipeline). For example, this setback will not comply with the Forest Service's and Bureau of Land Management's riparian buffer protection requirements as presented in their Water Quality Restoration Plans which serve as their TMDL Implementation Plans. In Resource Report 1 noted above, PCGP notes that there are 922.64 acres of TEWAs. Please identify the location of each TEWA that PCGP will locate within one and two potential tree heights away to 50 feet from waters of the state. For streams, please indicate the distance of each TEWA from the ordinary high water mark of the stream or riverine wetland. Additionally, please note the land ownership where each TEWA is located. In addition, on page 58 of Resource Report 1 for the gas		

	pipeline, PCGP indicates that the pipeline – in some places – will impact riparian vegetation while paralleling streams. Specifically, this report notes that the "proposed route will avoid paralleling a waterbody within 15 feet or less, where feasible." In this report, PCGP notes that this placement is consistent with the Section V.B.2.a of FERC's Wetland and Waterbody Procedures. However, 15 feet of riparian buffer would violate DMA riparian buffer protection requirements. Moreover, based on the literature, a 15-foot riparian buffer for thermal regulation of streams may result in thermal gain to the adjacent water body. As result, please identify each segment of the pipeline's construction right-of-way and permanent right-of-way that is parallel to waters of the state and within two site potential tree heights from waters of the state. Please provide the location and a detailed rationale for siting TEWAs closer to streams than authorized by a DMA's riparian buffer protection requirements and when siting sections of the construction and permanent		

	right-of-way. For example, the PCGP's rationale in Resource Report 1 (page 58) for not proposing setbacks larger than 50 feet in Riparian Reserves is that larger setbacks "would render the TEWA useless for the stream crossing." PCGP should justify its proposal for non-standard riparian buffer protections by providing the following information: • A description of the specific constraints at each site preventing the use of a TEWA in an area. • The specific rationale why the TEWA must be closer to the stream crossing. Without this specific information, DEQ cannot determine that Pacific Connector Gas Pipeline attempted to first avoid and minimize riparian impacts to the maximum extent practicable before seeking to mitigate these impacts.		
20	This compliance assessment must also identify other locations where PCGP will not comply with Designated Management Agencies' riparian protection areas when siting the following:	PCGP will provide a response to DEQ in Q4 of 2018.	DEQ anticipates PCGP's response in Q4 2018.

	• Temporary and Permanent Access Roads, • Staging areas, • Material storage areas, and • Other components (e.g., compressor stations, metering stations) of the pipeline.		
21a	Please include a detailed justification for seeking alternative riparian buffer protection requirements when siting these facilities within riparian areas.	PCGP will provide a response to DEQ in Q4 of 2018.	DEQ anticipates PCGP's response in Q4 2018.
21b	Pacific Connector Gas Pipeline must evaluate the thermal impacts from all noncompliance with DMA riparian protection requirements requested above where PCGP has provided and DEQ has approved the following information: • Detailed information demonstrating it considered all actions to first avoid or then minimize impacts to riparian areas to the maximum extent practicable. • Detail rationale for proposing nonstandard widths for riparian buffer protections.	PCGP will provide a response to DEQ in Q4 of 2018.	DEQ anticipates PCGP's response in Q4 2018.

	This evaluation must be included in PCGP's Thermal Impacts Assessment noted in the comments below on compliance with state water quality standards.		
22	There is no information presented in Pacific Connector Gas Pipeline's Appendices for Timber Removal and Construction in the Transportation Management Plan (Part 2, Appendix E-8). Please provide the location of the approximately 660 miles of existing public and private roads that PCGP proposes to use to construct the gas pipeline and/or support its operation. In this updated plan, please delineate these existing public and private roads by ownership as follows: • Private road on land zoned for forest use • Private road on land zoned for agricultural use • Private road on land zoned residential, commercial, and industrial use by Coos, Douglas, Jackson, and Klamath County • Public road owned and operated by Coos, Douglas, Jackson, Klamath County	Maps of access roads proposed for use for construction of the pipeline are included in Appendix B to Part 2 of the JPA (see pdf page 183 and 661 – please note that the same set of maps are provided twice, as their own attachment and as an appendix to the overall Project Description). A list of the roads is included in Table A.8-1 on pdf page 143. Table A.2-6 is in Appendix A.2 to Resource Report 2 (Attachment C of the PCGP JPA package) lists waterbodies crossed by or within 100 feet of temporary and permanent access roads or existing access roads where improvements will be required prior to use. PCGP will provide a revised table A.2-6 is in Appendix A.2 to Resource Report 2 (Attachment C of the PCGP JPA package) that will identify best management practices for waterbodies crossed by or within 100 feet of temporary and permanent access roads.	**<u>Statement Summary</u>: PCGP's response to Comment 22 did not identify the ownership of all the access roads PCGP proposes to use. In the section below, DEQ provides specific examples where ownership is unknown. DEQ requires site-specific, detailed information on road maintenance and road improvement actions PCGP will need to perform to protect water quality when using the more than 660 miles of access roads. DEQ provides the rationale for this information request in the section below as well as examples of the level of required detail. In particular, DEQ refers PCGP to a tool to identify roads that are hydrologically connected to water bodies. Please provide responses to Comment 22 using the examples and guidance provided below.** Information in submittal documents do not include all the information requested in Comment 22 of AIR-1. For example, on Sheet 1 of 55 of Drawing No. 3430.31-Y-Map 1, the specific ownership of the following roads as well as others is not identified: • Logging Spur 6.64R – 7.34R • Carlson Heights Road 7.34R – 7.44R • Willanch Slough 8.44R • Logging Spur 8.17R These are just a few examples among many on PCGP's drawings. Without information on the specific ownership of each road, DEQ cannot evaluate compliance with TMDL allocations as required in OAR 340-048-0042(2). As requested in AIR-1, please delineate these public and private roads by ownership where ownership is unclear. Additionally, PCGP provides only limited information in Table A.8-1 regarding the improvements needed for PCGP to use various access roads for pipeline construction and/or operation. For example, PCGP provides only the following information: requires pothole filling, blading/grading, brush limbing, widening and/or turnouts. As explained using an example in DEQ's review of PCGP's response to Comment 23 below, this information does not tell DEQ that PCGP evaluated these roads for their potential impact to water quality. DEQ is most interested in an assessment of the roads with dirt, gravel, bituminous, and rock surfaces for their potential impact to water quality under different levels of use noted in Table A.8-1. Moreover, given the information provided in PCGP's submittal, many of these road these access roads will experience loads from the following activities: • Haul heavy equipment for road building and improvements to support forest harvesting.

	• Public road on the Umpqua, Rogue-Siskiyou, and Winema-Fremont National Forest • Public road on land in the Bureau of Land Management Coos Bay District, Roseburg District, Medford District, Klamath Resource Area • Public road on Bureau of Reclamation land DEQ will use this information to evaluate compliance with the Section 303 of the Clean Water Act as noted above.	PCGP anticipates submitting the revised table to ODEQ in Q4 2018.	• Provide access to the approximately 300 miles of pipeline alignment for logging trucks and logging equipment to clear the construction right-of-way of vegetation. • Haul logs from the construction right-of-way. • Provide access for truck traffic for reforestation of the construction ROW. • Haul stumps as well as a portion of the slash that will not be left in the 30-foot swath of the 50-foot permanent right-of-way as this right-of-way needs to be clear for periodic vegetation management and future pipeline repairs. • Haul heavy equipment to construct a construction right-of-way that will require the removal of mountain ridgetops in the Coastal and Cascade Mountain Ranges. • Haul rock and soil to disposal sites that PCGP removed from ridgetops to create the permanent right-of-way. • Haul heavy equipment for laying the pipeline. • Haul heavy equipment to rip/subsoil or scarify compacted soil during the restoration of the construction right-of-way. To develop its Certification Decision, DEQ requested and must receive in response to Comment 22 the following: • An evaluation of each access road segment's current condition relative to applicable standards and specifications. • An evaluation of needed improvements to protect water quality as requested in Comment 23 below. This information is critical for DEQ to evaluate PCGP's compliance with Total Maximum Daily Load Implementation Plans of Designated Management Agencies as requested in Comments 15 and 16 noted above. In fact, the Oregon Department of Forestry – a Designated Management Agency – developed a Technical Note 8 to guide the implementation of Forest Practices Act rule that states: *Road drainage must be improved when there is the likelihood of substantial sediment delivery if the drainage system is not upgraded. Inspection of the road drainage on inactive roads prior to active road use is essential. Evidence of potential sediment delivery include the following conditions:* *ROAD USE CHANGING - LIKELY SEDIMENT DELIVERY* • *No cross drain structure (for filtering) within 200 feet of a stream crossing* • *Streams running in roadside ditches* *ROAD USE NOT CHANGING - LIKELY SEDIMENT DELIVERY ON ANY ROAD* • *When gullies (over 100 feet in length) exist in a ditch, or below a cross drain* • *Surface drainage waters flow into cracks on the outside edge of the road*

			• *When more than 30 percent of the road system draining directly to streams or into gullies (a goal for a superior road is 15 percent)* *REPAIRS FOR OLDER ROADS* *When repairing older roads, streams running down ditches need to be put back into the original channel. Other common repairs are adding cross drains for filtering above stream crossings, and installing new cross-drains where gullies have formed in the ditch or at culvert outlets. In general, the information on drainage of new roads as described earlier in this Technical Note are also appropriate for maintenance of older roads. Use any technique that efficiently fixes the problem.* As discussed in more detail in the review of PCGP's response to Comment 15, this information is necessary to ensure compliance Oregon Administrative Rule 629-625-0600. Oregon Department of Forestry uses this Forest Practices Act rule regarding road maintenance to protect water quality by requiring the timely maintenance of all active and inactive roads. ODF uses this rule to comply with Total Maximum Daily Loads and water quality standards as noted elsewhere in DEQ's review. The information request in Comment 22 is essential for evaluating PCGP's practices to protect water quality on PCGP's proposed private access roads as well as proposed public access roads. In Section 2.1.1 of the Transportation Management Plan, PCGP states only the following: *PCGP will obtain landowner agreements for any use of private roads. All conditions agreed to with the landowner must be met by the Contactor for continued use of the road. Where access is not available to Agency lands or Roads, and in cases of private roads of mutual interest, PCGP will coordinate with the appropriate Agency(ies) in the identification and acquisition of access rights related to the right-of-way locations for the Grant and TUP.* At minimum, to formulate a Certification Decision, DEQ must receive and review all private landowner agreements for use of private roads to ensure compliance with Forest Practices Act rules administered to comply with water quality standards as noted above and in DEQ's review of PCGP's response to Comment 15. To protect water quality, these private agreements must include: • PCGP's evaluation of the current conditions of these roads to protect water quality. • PCGP's reconstruction plan – if needed to protect water quality/comply with the Forest Practices Act – to prepare these private forest roads for their proposed use. • PCGP's maintenance plan for these roads once PCGP makes needed improvements to protect water quality.

			To develop the Certification Decision, DEQ requires PCGP to provide specific information on where PCGP will apply specific maintenance actions and when PCGP will apply these actions. This information is required for all the private and public access roads. In preparing AIR-1, DEQ reviewed Table A.2-6 in Appendix A.2 of Resource Report 2. The information in this table does not provide DEQ with a detailed maintenance and improvement plan for the approximately 660 miles of access roads to construct and/or operate this pipeline requested in Comment 24. As noted in the University of Nebraska's/USDA Forest Service's review of forest roads entitled Protecting Soil and Water in Forest Management, road maintenance is critical to protecting water quality. Given the research on roads and water quality, DEQ is most concerned with the dirt, gravel, bituminous, and rock surfaced access roads given their high potential to discharge sediment to waters of the state when under use for forest clearing and pipeline construction as documented elsewhere in DEQ's review of PCGP's response. Additionally, PCGP's table referenced in its response only identifies access road segments within 100 feet of waterbodies. Road conditions and their use beyond 100 feet of waterbodies can affect these waterbodies. PCGP must address all roads hydrologically connected to waterbodies in its pursuit of a Section 401 Water Quality Certification for its proposed activities. To identify objectively these hydrologically connected roads, PCGP may use Geomorphic Road Assessment and Inventory Package (GRAIP) or a comparable analytical tool approved by DEQ. DEQ is very skeptical that PCGP will provide the level of detail DEQ is requesting in AIR-1 in PCGP's update to the information presented in Table A.2-6. For an example of the detail that DEQ is expecting, please see DEQ's review of PCGP's response to Comments 23 and 24 below. This review provides examples of the level of detail DEQ is requesting and expecting to receive from PCGP to develop the Certification Decision.
23	Provide documentation demonstrating that PCGP inventoried these existing roads to identify necessary maintenance actions and needed improvement to protect water quality. The documentation should include (1) the results for the inventory for each road segment and recommended maintenance prescription and (2) the road assessment protocols used to perform this inventory, and (3) the evaluation tool used to assess the surface erosion risk, gully	PCGP will provide a revised Table A.2-6 from Appendix A.2 of Resource Report 2 that will identify best management practices for waterbodies crossed by or within 100 feet of temporary and permanent access roads.	**Summary Statement: Revising the table of proposed BMPs for waterbodies crossed or within 100 feet of temporary and permanent access roads does not address the central concerns expressed in Comment 23. Please refer to DEQ's Summary Statement for Comments 4 and 5. BMPs are a tool to reduce water quality impairment but do not represent a strategy to ensure water quality protection. DEQ requires a comprehensive inventory of temporary and permanent access roads, road inventory assessment protocols, and – most importantly – an analysis of surface erosion, gully formation, landslide potential, crossing failure, and other risks associated with predicted use of temporary and permanent roads. The section below describes a tool to identify roads hydrologically connected to water bodies and examples of detail required to adequately address project impacts. Please address the data request in Comment 23 based on the analysis and examples provided below.** DEQ does not believe PCGP's proposed additions to Table A.2-6 in Appendix A.2 of Resource Report 2 will provide DEQ with the level of detail regarding road maintenance prescriptions as well as road improvements needed to ensure the use of existing access roads will protect water quality. First, the road segments presented in the table reference in PCGP's response (i.e., Table A.2-6) includes only those segments within 100 feet of a waterbodies. DEQ is requesting PCGP's inventory evaluate all existing access roads hydrologically connected to waterbodies. To identify objectively these hydrologically connected roads, PCGP may use Geomorphic Road Assessment and Inventory Package (GRAIP) or a comparable analytical tool approved by DEQ.

	risk, landslide risk, and stream crossing failure risk.		Including these access roads will allow PCGP to assess all the potential impacts on receiving water quality. Secondly, in Comment 23, DEQ did not request that PCGP identify BMPs. DEQ is requesting documentation demonstrating that PCGP conducted an inventory of all existing access roads to evaluate their potential impact to water quality when used by heavy equipment and large truck traffic to construct and operate the gas pipeline. Please provide this information for all access roads hydrologically connected to water bodies. PCGP's evaluation of water bodies crossed by or within 100 feet of access roads is too narrow to protect water quality. To identify objectively these hydrologically connected roads, PCGP may use Geomorphic Road Assessment and Inventory Package (GRAIP) or a comparable analytical tool approved by DEQ To evaluate the effectiveness of PCGP's inventory of existing access roads for potential water quality impacts, DEQ requests the road assessment protocols and the evaluation tool used by PCGP to perform this inventory (e.g., USDA Forest Service Water/Road Interaction Field Guide and the Geomorphic Road Analysis and Inventory Package noted in DEQ's AIR-1). Currently, DEQ cannot evaluate the road assessment protocols and evaluation tool PCGP used to identify road maintenance treatment and road improvements needed for the approximately 660 miles of access roads. PCGP's Table A.8-1 in Part 2 of Appendix B in the Joint Permit Application provides only the following footnotes regarding maintenance needs along the approximately 660 miles of access roads: • Footnote 1: requires potholing filing • Footnote 2: blading/grading • Footnote 3: brush limbing • Footnote 4: widening and/or turnouts These footnotes do not indicate to DEQ that PCGP has inventoried all the access roads or evaluated their potential for water quality impacts. DEQ's goal with this information request is to determine if PCGP is taking proactive measures to protect water quality prior to using access roads. The scientific literature concerning the water quality impacts associated from forest roads is extensive as noted elsewhere in DEQ's review, and there are tools to evaluate the potential for water quality impacts from forest roads. DEQ requires assurance that roads conditions are fully evaluated to identify structural deficiencies that may lead to water quality impairment because of heavy industrial use. Non-paved roads will be a source of sediment delivery to stream unless, if needed, PCGP designs their construction and maintenance to support this proposed level of use.[37] For example, a footnote referring to potential potholes must also address the effect this maintenance action may have on water quality. PCGP must also describe information on the formation of potholes. Did the potholes form due to a soft

[37] Grace III, J.M. and B.D. Clinton. 2007. Protecting Soil and Water in Forest Road Management. USDA Forest Service/University of Nebraska-Lincoln. Faculty Publication Volume 50(5):1579-1584. 2007 American Society of Agricultural and Biological Engineers ISSN 0001-2351

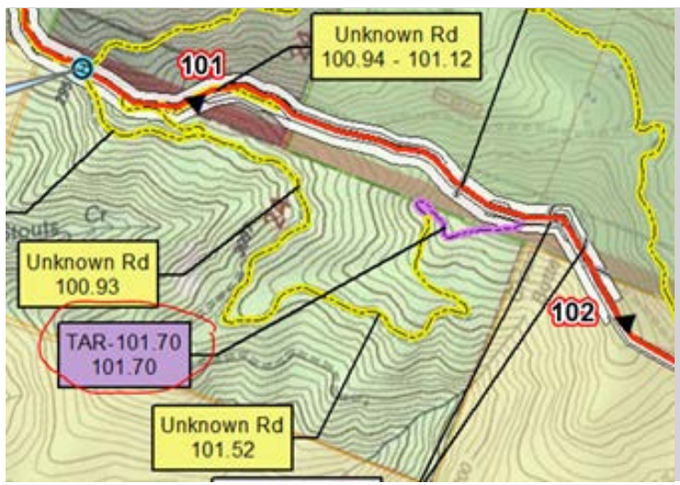
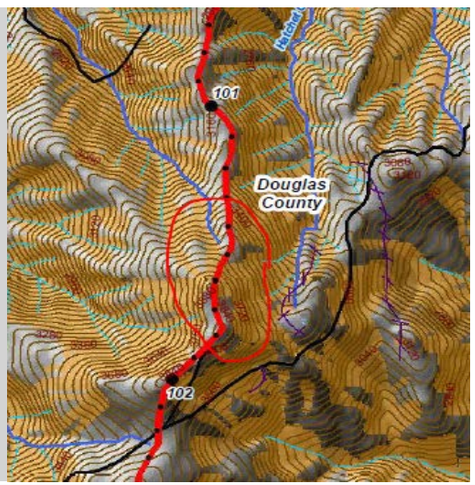
			subgrade and/or poor drainage from a non-paved road surface? Does the gravel road surface need replacement and geotextile fabric reinstalled to improve drainage from the road surface? Further, PCGP should include a strategy for monitoring road conditions, prioritizing maintenance actions, a decision matrix to identify and apply appropriate remedies, post-remedial monitoring, communication, and documentation. The information DEQ is requesting in Comment 23 is essential and necessary to protect water quality and to ensure the construction of this pipeline has the potential to comply with water quality standards. Given the limited budgets in the public and private sectors, deferred road maintenance is common. For example, in its submittal, PCGP notes that certain access roads will need improvements to move equipment into construction right-of-way. If PCGP inventories these access roads using evaluation criteria designed to protect water quality, this inventory will likely identify necessary improvements to achieve the following water quality protections: • Stabilize non-paved road surfaces to prevent sediment discharge into roadside ditches. • Improve stormwater management systems for roads to limit stormwater discharge into water bodies. • Design stable fill and cut slopes particularly for roads experiencing years of deferred maintenance. For example, in PCGP's General Location Map Drawing Number 3430.31-Map 12, Unknown Road 73.70 and Badger Creek Road (BLM 29-5-11) will experience widening in the Tyee Core Area. When these road improvements are evaluated in the context of PCGP's Geologic Hazard Maps (Figures 16 and 17 of 47), DEQ has concerns regarding PCGP's controls for maintaining slope stability when improving these roads. Hearn (2011) summarizes the issues and concerns for improving existing roads on slopes as follows: *Excavation into the hillside may reactivate landslides and trigger new slope failures: widening onto fill will invariably require additional retaining wall construction with considerations of bearing capacity and foundation stability. There may also be issues with stability of previous uncompacted construction spoil that has since become vegetated, giving the appearance of being in situ ground.* *On Balance, if suitable foundations and adequate compaction can be achieved it is preferable to widen onto fill, but each section of road will require its own assessment. If there is any uncertainty over the bearing capacity and foundation stability for walls or stability of natural slopes and fill slopes below the road, then it is preferable to widen into cut. A balance of cut and fill, either in cross-section or over relatively short alignment lengths, is the preferred solution if the cut material is suitable as fill (Section C2). On low-cost improvement schemes, the ease of excavation and the costs and difficulties associated with fill and retaining wall construction usually mean that widening takes place as cut to spoil, frequently to the detriment of slope stability. Engineering geological assessments and ground investigations will be required (Section B) before such important decisions are made.*

			The information PCGP provides in its submittal does not indicate to DEQ that PCGP has considered these complex issues. PCGP provided DEQ their proposed site-specific designs for these road segments in steep and potentially unstable slopes and the technical support for these designs. PCGP will need to provide DEQ information on where specifically (e.g., geo coordinates) PCGP will perform road maintenance actions and when PCGP will perform these actions. Once the inventory requested above is performed, PCGP will also need to provide DEQ with information on where specifically (e.g., geo coordinates) PCGP will improve access roads to protect water quality.
24	Provide a detailed maintenance and improvement plan for the approximately 660 miles of existing roads. This plan must demonstrate that PCGP will implement all maintenance actions and improvements necessary to protect water quality – identified during the road inventory – prior to road use for pipeline construction or operation. This plan must also (1) implement Designated Management Agencies' DEQ-approved TMDL Implementation Plans and (2) comply with maintenance standard, requirements, and/or other design standards developed and used by DMAs to implement these TMDL Implementation Plans.	PCGP is currently working with USFS, BLM, and BOR to provide the necessary information for the federal agencies to issue right-of-way grants for federal lands. An operations and maintenance plan will be prepared if required by the agencies during that process.	***Summary Statement:*** ***Notwithstanding information required for right-of-way grants on federal lands, DEQ requires PCGP to develop a maintenance and improvement plan to address, as authorized by OAR 340-041-0007(7) and OAR 340-048-0042(2), to address water quality impairments from access roads on all public and private lands. Please develop and submit a maintenance and improvement plan consistent with the data requested in Comment 24 and the examples provided in the following section.*** DEQ's request for a detailed maintenance and improvement plan is not contingent upon Federal agencies requiring PCGP to develop a plan. DEQ's authority under OAR 340-041-0007(7) and 340-048-0042(2) require PCGP to develop a maintenance and improvement plan for all public and private project-related roads. DEQ presents the scientific basis for this information request in the references included in DEQ's review of PCGP's response to DEQ's comments noted above. DEQ's administration of Section 303 of the Clean Water Act requires Designated Management Agencies operating under a Total Maximum Daily Load address road management activities including road maintenance. For example, DEQ's Memorandum of Understanding with the USDA Forest Service Pacific Northwest Region presents DEQ's and Forest Service's strategy for controlling point and nonpoint source water pollution and addressing Clean Water Act requirements such as TMDLs. This MOU establishes procedures to implement State and Federal water quality rules. These procedures reference a foundation for action for protecting water quality on U.S. Forest Service lands. This foundation is entitled the *National Best Management Practices for Water Quality Management.*[38] These practices include a section on road operations and maintenance. Moreover, Federal agency Water Quality Management Plans also serve as TMDL Implementation Plans as noted elsewhere in this DEQ review of PCGP's response to AIR-1. These plans may identify roads and their management as sources of nonpoint source pollution to be address in Federal agency actions to implement these plans. The Forest Service and BLM document this fact in the *Forest Service and Bureau of Land Management Protocol for Addressing Clean Water Act Section 303(d) Listed Waters* (May 1999, Version 2.0). For example, the BLM's Water Quality Restoration Plan for the South Umpqua (March 2, 2001) identifies sediment from roads and road encroachment as a key issue for protecting water quality on BLM lands. Similarly, the North Fork Coquille River WQRP (November 2001) identifies roads as creating water quality impacts from increasing peak flows in streams and sediment discharge into streams. This plan states the following as a management action for this WQRP:

[38] USDA Forest Service. 2012. National Best Management Practices for Water Quality Management. Volume I: National Core BMP Technical Guide. FS-990A

			…continuing to decommission, improve, or maintain federally administered roads will reduce the potential fine sediment supply and the potential increases in peak flows. Finally, as noted elsewhere in DEQ's review of PCGP's response to AIR-1, the scientific literature is replete with research documenting that road construction and maintenance has a substantial impact on water quality. With Comment 24, DEQ is exercising its authority to ensure compliance with water quality requirements and standards during the process of developing a Certification Decision. DEQ notes below examples of the level of detail DEQ is requesting in Comment 24. Specifically, DEQ is most interested in the current condition of dirt, gravel, bituminous, and rock surfaced access roads prior to use by PCGP for pipeline construction and operation. For the requested maintenance and improvement plans, DEQ is interested in receiving information on the specific location (i.e., delineated by GPS coordinates) for all the road maintenance treatments PCGP proposes to implement to protect water quality on all access roads that are currently hydrologically connected to waterbodies. This geographical information will allow DEQ to evaluate compliance and more effectively exercise its enforcement authority when ensuring compliance with a Certification Decision. Maintenance treatments could include, for example, the following: • Installation of geotextile fabric for soft and weak subgrades • Installation of a durable surface • Gravel road rehabilitation • Application of dust palliatives • Reshape surface and shoulder • Reshaping entire cross section • Re-establish the out-slope • Re-establish the in-slope and ditch • Removal of high shoulders (secondary ditches) • Reshape and vegetate ditch to prevent erosion • Rock ditches to prevent erosion • Installation of check dams in ditch to prevent erosion • Installation of cross drains to prevent gully formation and sediment discharge in ditches • Relocating road drainage discharge away from steep slopes, headwalls, bedrock hollows, active landslides areas, areas with high potential for rapidly moving landslide

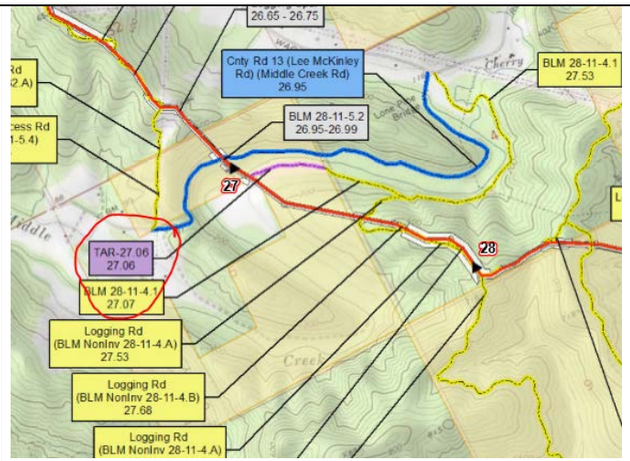
			In issuing treatment prescriptions based on PCGP's road inventory requested in DEQ's review of PCGP's response above, DEQ expects PCGP to provide the detailed maintenance standards and specifications that PCGP will use for all identified treatments.
25	Identify the location of all existing roads that PCGP will use to access the gas pipeline during its operation. Provide a maintenance plan for these existing roads that includes: • A description of the level of use these roads will experience during the pipeline's operation. • A description of the maintenance practices to protect water quality and a schedule for performing these practices and supporting this level of use.	Outside of federal lands, PCGP's use of public roads are not subject to federal licensing or permitting, and therefore no certification is required under Section 401. PCGP is not required under federal or state law to prepare operations and maintenance plans to use public roads. PCGP anticipate employing less than 15 operational staff. The operation traffic will be incidental to the existing traffic on existing road.	DEQ will review all proposed project-related activities that require a federal permit or permits and that may cause or contribute to a discharge to waters of the state. OAR 340-041-0007(7) and 340-048-0042(2) authorize DEQ to require maintenance plans to address discharge from temporary and permanent roadways. This includes permanently maintained access roads to service portions of the pipeline and its aboveground facilities. Given their potential to impact water quality through sediment discharge, DEQ is particularly concerned with the maintenance and operations planning for non-paved PARs when PCGPs uses these roads for pipeline repair and reconstruction given the heavy equipment traffic associated with these activities.
26, 27	Comment 26: Please provide the location of the proposed 25 miles of new Temporary and Permanent Access Roads and the selection criteria used to site these new roads to avoid minimize impacts to water quality. Please delineate these new roads by land ownership (e.g., private ownership on land zoned for forest use) so DEQ can evaluate compliance with Section 303 of the Clean Water Act. Comment 27:	Appendix B in Part 2 (Table 1.2-2 on pdf page 329) provides a table of the ten (10) temporary and 15 permanent access roads by milepost and landownership. There are not 25 miles of Temporary and Permanent access roads; the roads total approximately 2.2 miles (and 5.96 acres), not 25 miles as stated in the comment. They are shown on the maps included in the PCGP JPA (beginning on pdf page 660). Table 2.2-5 (pdf page 1104) lists those temporary and permanent access roads within 100 feet of waterbodies, all of which are located on private	**Summary Statement: DEQ requests that PCGP provide the selection criteria used to evaluate and choose road segments proposed in their application. In particular, DEQ wishes to review the decision-making criteria used to ensure road development would avoid conflicts with streams, wetlands, and waterbodies to the maximum extent practicable. DEQ further requests PCGP conduct an analysis to determine hydraulic connectivity of road surfaces and waters of the state using the analytical tools and the design standards addressed in the following section.** DEQ located the 25 (10 temporary and 15 permanent) segments of new road building proposed for the construction and operation of the pipeline in the maps included in PCGP's Joint Permit Application on pdf page 660. As discussed elsewhere in DEQ's review of PCGP's response to AIR-1, DEQ is requesting the level of detail provided in the examples below to evaluate the impacts of PCGP's proposed new roads to build and operate the pipeline. As noted elsewhere in DEQ's review of PCGP's response, new roads or existing roads do not have to be within 100 feet of a water body to have a potential impact on water quality. PCGP refers DEQ to Table A.2-6 in Appendix A.2 of Resource Report 2 for temporary and permanent access roads crossed by or within 100 feet waterbodies. This scope of analysis and the limited information provided in Table 2.2-5 is inadequate for DEQ to evaluate the potential impacts to water quality. PCGP must evaluate all Temporary and Permanent Access Roads hydrologically connected to water bodies. To evaluate objectively evaluate the impact of these Temporary and Permanent Access Roads on water quality, PCGP may use X-DRAIN or a comparable analytical tool approved by DEQ.

	To ensure these roads will not serve as a source of sediment to and hydromodification of waters of the state and as a source of debris flows into streams from road-related landslides, please include the design standards and specifications for constructing these roads including their drainage systems, cut-slopes, and fill-slopes. Please identify the proposed designs to stabilize fill slopes and cut slopes and manage stormwater on new temporary and permanent roads located on the steep slopes (i.e., slopes greater than 30%) and engineering support for these designs. This information is necessary for DEQ to evaluate compliance with the statewide water quality criteria for road building and maintenance (OAR 340-041-0007)(7) and for ensuring that PCGP uses the highest and best practicable treatment control (OAR 340-041-0007(1).	lands. Four waterbodies will be crossed by permanent access roads, and three of those waterbodies are ditches. Appendix A in Part 2 of the 401 Water Quality Package issued to DEQ on February 6, 2018 outlines PCGP's compliance with all applicable water quality standards and where plans have been developed for the Pipeline to ensure compliance with those standards, including compliance with requirement for TMDLs on federal and non-federal lands. Table A.2-6 is in Appendix A.2 to Resource Report 2 (Attachment C of the PCGP JPA package) lists waterbodies crossed by or within 100 feet of temporary and permanent access roads. PCGP will revise table A.2-6 (Appendix A.2 to Resource 2 – Attachment C of the PCGP JPA package) to identify best management practices for waterbodies crossed by or within 100 feet of temporary and permanent access roads. PCGP anticipates submitting	Without design details and their technical support, DEQ is unable to determine if PCGP is designing new permanent and temporary roads hydrologically disconnected to water bodies by the design of their drainage system. The Oregon Department of Forestry established rules to address drainage from forest roads as highlighted in DEQ's review of PCGP's response to Comment 15 above. ODF developed these rules to comply with water quality standards. The design of a road drainage system and a non-paved road surface, for example, influences the level of sediment delivery into water bodies as discussed elsewhere in DEQ's review of PCGP's response to AIR-1. Moreover, the location of cut and fill slopes and their design can destabilize slopes and lead to the failure of unstable, landslide prone slopes. As noted elsewhere in DEQ's review of PCGP's response, the literature is replete with information demonstrating that linear infrastructure such as roads can cause slope failures leading to landslides and sending debris flows into stream channels. Human-caused debris torrents impact water quality by changing the natural cycles of sediment delivery to stream systems.[39] PCGP has not provided DEQ with the selection criteria PCGP will use to site proposed new roads to avoid impacts to water quality. For example, PCGP directed DEQ to Table 1.2-2 (Temporary and Permanent Access Roads for the Pipeline). In this table, the Temporary Access Road labeled as TAR 101.70 appears to be on both Private and National Forest Land (Umpqua National Forest). This TAR provides an example of DEQ's concerns regarding the siting of these new roads. As shown in the following map excerpts below, PCGP has located TAR 101.70 in a Potential Rapidly Moving Landslide Hazard Area when DEQ compares PCGP's USGS Quad-Based General Location Maps with PCGP's Geologic Hazards Maps:  

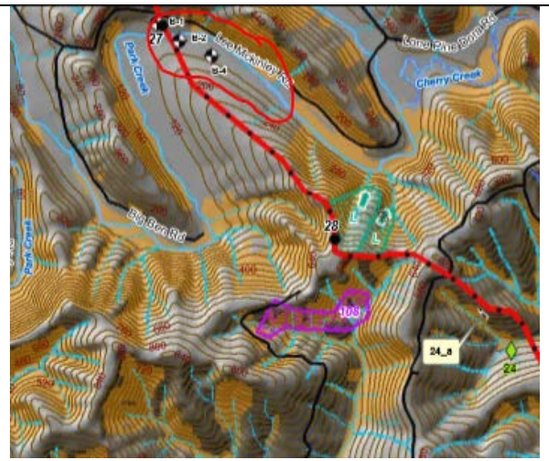
[39] Castro, Janine and Frank Reckendorf. 1995. Effects of Sediment on the Aquatic Environment: Potential NRCS Actions to Improve Aquatic Habitat. Working Paper No. 6. USDA Natural Resources Conservation Service

		the revised table to ODEQ in Q4 2018.	Location of TAR 101.70 near Milepost 102 in Part 2 JPA Appendix B, General Location Maps, Drawing No. 340.31-Y-Map 14, Sheet 27, 55 Area where TAR 101.70 will be located in Resource Report 6, Appendix F, Figure 22 of 47. **Note**: the light brown areas are Potential Rapidly Moving Landslide Hazard As noted in DEQ's review of PCGP's response to Comment 15, the Oregon Department of Forestry uses rules developed under the Oregon Forest Practices Act to comply with Total Maximum Daily Loads and with water quality standards. In ODF's memorandum of understanding with DEQ referenced in DEQ's review above, ODF states that it has adopted water protection rules in the form of BMPs for forest operations "including, but not limited to, OAR Chapter 629, Divisions 635-660." With the limited information that PCGP provides, DEQ is unable to determine if PCGP is complying with the following Forest Practices Act rule (OAR 629-625-0200): ***Road Location*** *(1) The purpose of this rule is to ensure roads are located where potential impacts to waters of the state are minimized.* *(2) When locating roads, operators shall designate road locations which minimize the risk of materials entering waters of the state and minimize disturbance to channels, lakes, wetlands and floodplains.* *(3) Operators shall avoid locating roads on steep slopes, slide areas, high landslide hazard locations, and in wetlands, riparian management areas, channels or floodplains where viable alternatives exist.* *(4) Operators shall minimize the number of stream crossings.* *(5) To reduce the duplication of road systems and associated ground disturbance, operators shall make use of existing roads where practical. Where roads traverse land in another ownership and will adequately serve the operation, investigate options for using those roads before constructing new roads.* Moreover, PCGP has not provided DEQ with any information indicating that it has investigated the constraints associated with the proposed site for TAR 101.70. PCGP has not developed engineering solutions – with associated technical support – to avoid debris flows into East Fork Stouts Creek or the intermittent streams below the fill slope of this proposed road sited in an area identified as hazard for Rapidly Moving Landslides. Hearn 2011 provides techniques for planning new road construction on steep mountainous terrain and include the following as stated in his book: *B1.2.1 New Road Construction* *The techniques listed in Table B1.3 are variously applicable to all project phases, but they offer the greatest application to new road construction projects as an aid to route corridor selection and*

			the development of the engineering design. The order in which the techniques are listed in the table, and described in Section B2-F5, is the approximate order in which they should be applied. *B1.2.4 Road Operation and Maintenance* *During road operation and maintenance, the focus of attention will be directed towards existing cut and fill slopes and the management of drainage. Systematic routine observation, slope monitoring and condition surveys will form the basis of the records necessary for ongoing assessment of slope stability. Field mapping, cross-section survey and ground investigation or monitoring at high-risk site may be required for the reinstatement and remedial works for slopes and section of road that have failed (Part D).* Hearn's recommendations for road construction, operation, and maintenance serve as one of several reasons for DEQ's request for additional information in Comment 26 and 27. Such recommendations and applicable regulatory requirements also serve as the basis for DEQ's information request in Comment 24. Hearn's recommendations provide examples of the information DEQ expects PCGP to provide DEQ when furnishing information on its maintenance plans for both Permanent Access Roads and existing access roads. Since PCGP needs access roads for PCGP's operation of the pipeline and the controlling authorities for these access roads cannot decommission these roads to avoid their associated water quality risks, these roads present potential impacts to water quality that PCGP must address in it 401 Water Quality Certification submittal. As a result, for access roads on steep and/or unstable slopes necessary for pipeline operation, PCGP must provide a maintenance plan that periodically evaluates the influence of these access roads on slope stability and evaluates the need to adjust the road design to help maintain the stability of the slope below and above the PAR. For another example of the lack of information provided by PCGP for proposed PARs and TARs, PCGP proposes to build Temporary Access Road labeled TAR 27.06. This TAR parallels the stream Park Creek and would extend a BLM road (BLM 29.11-4.1 27.53) when County Road 13 is also available to reach the temporary extra work area near Milepost 27. PCGP does not provide information detailing how PCGP will manage drainage from this proposed new access road and the extent, condition, or existence of a vegetated buffer between TAR 27.06 and Park Creek. PCGP does not provide information on the design of the cut slope for this TAR nor indicate with designs and technical support how PCGP will stabilize this cut slope to prevent small slides into the roadside stormwater conveyance system or perhaps prevent larger slides conveying debris flows into Park Creek directly. PCGP does not provide a discussion of the other alternatives to reach this TEWA. PCGP does not provide the rationale for building this new access road nor does PCGP provide the design details for DEQ to evaluate if this design has the potential to protect water quality.

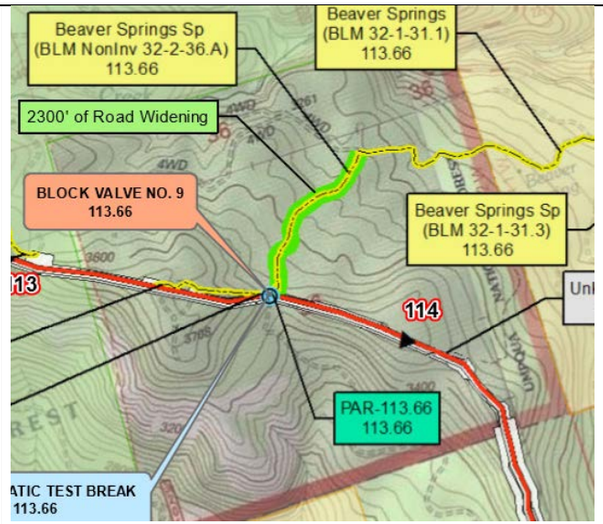


Location of TAR 27.06 near Milepost 27 on the General Location Maps. Drawing No. 3430.31-Y-Map 5, Sheet 6 of 55

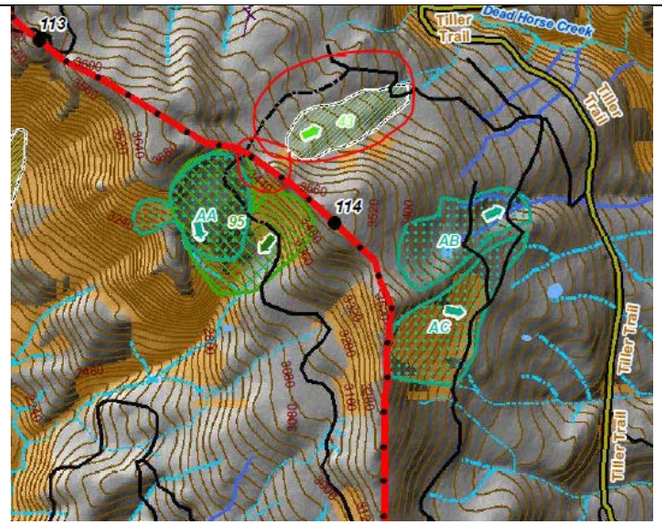


Location of TAR 27.06 near Milepost 27 on the Geologic Hazards Maps. Figure 8 of 47. **Note**: the light brown areas are Potential Rapidly Moving Landslide Hazard

PCGP is proposing to site another proposed new road labeled as PAR-132.66 and shown in the map excerpt below. PCGP proposes to locate this PAR in a Potential Rapidly Moving Landslide Hazard Area. This proposed PAR is also near landslides identified from Aerial Photos and from LiDAR. Moreover, PCGP is proposing to reconstruct BLM's Beaver Springs road (BLM Noninv 32-2-36.A) by widening it. According to PCGP's Geologic Hazard Map, this BLM road identified for widening is located above a landslide area that drains to intermittent stream discharging into Dead Horse Creek. PCGP has not provided DEQ with design information regarding the need for the creation of fill slopes for this proposed new road in an area with unstable slopes. PCGP has not provided DEQ with design information for the reconstruction of the BLM road above unstable slopes. Has PCGP conducted a geotechnical investigation of this road-widening project? If performed, does this geotechnical investigation indicate the need for reinforced fill for this road-widening project? Where will PCGP discharge the post-construction stormwater for this PAR? Given the lack of design details, these questions surface for DEQ while reviewing PCGP's submittal.



Location of PAR-113.66 and the reconstruction of BLM Noninv 32-2-36.A. Drawing No. 340.31-Y-Map 14, Sheet 32, 55



Location of PAR-113.66 and Proposed Road Reconstruction relative to landslide features. Figure 25 of 47. **Note**: the light brown areas are Potential Rapidly Moving Landslide Hazard

As discussed in DEQ's review of PCGP's response to Comment 15, the management of stormwater discharge and the design of cut and fill slopes are important engineering considerations when constructing roads on steep and unstable slopes. The intent of DEQ's request for information on PCGP's selection criteria is to evaluate PCGP's efforts to minimize impacts to water quality from debris flows during new road construction. As noted below, PCGP should analyze the various options for accessing sections of the pipeline alignment for construction and operation as part of its efforts to address the National Environmental Protection Act requirements and, based on this analysis required by NEPA, determine the need to build new roads such as TAR 101.70 discussed above. To evaluate PCGP's efforts to avoid and minimize impacts to water quality, DEQ is requesting that PCGP provide its selection criteria for determining the need and location of TARs and PARs that PCGP used in its alternative analyses to comply with NEPA.

DEQ is highlighting the information below to provide PCGP with an example of the level of detail DEQ is anticipating in PCGP's revision of Table A.2-6. DEQ requests this detailed information to evaluate PCGP's compliance with Clean Water Act requirements such as Total Maximum Daily Loads. For example, as noted above, the Forest Service and Bureau of Land Management use Water Quality Restoration Plans to comply with Clean Water Act requirements concerning nonpoint source pollution and Total Maximum Daily Loads. The BLM's Water Quality Restoration Plan for the Elk Creek

			Watershed applies to a portion of the pipeline where PCGP is proposing to place the pipeline alignment. Forest Service and BLM Roads are within the Elk Creek Watershed. In its WQRP, BLM identifies sediment input from roads as the primary human-caused sediment source from BLM-administered lands in the plan area and an influence on channel morphology with effects on stream temperature. BLM's restoration goals in this plan include: • Reduce road densities. • Maintain and improve road surfacing. • Minimize future slope failures through stability review and land reallocation if necessary. To achieve their restoration goals when roads are an element, BLM and the Forest Service have manuals and handbooks for locating new roads, engineering road construction/reconstruction, and conducting road maintenance. These technical manuals and references are the tools and strategies the Forest Service and BLM use to implement their WQRPs and, consequently, comply with TMDLs issued by DEQ. As noted elsewhere in this review, TMDLs are DEQ's plan to ensure a water body impaired by pollutant discharge ultimately achieves water quality standards. For example, the Forest Service Manual states: *Perform route or site selection, location, geotechnical investigation, survey, and design to a technical level sufficient for the intended use of the facility, the investment to be incurred, and the affected resource values.* *Ensure that road preconstruction activities receive peer reviews, and that the adequacy of road designs and cost estimates is attested to in writing by qualified engineers.*[40] In the Forest Service Handbook 7709.56 on Section 22.2 (Location Marking), the Forest Service provides the following directive for determining the location of a proposed road: *22.1 - Initial Field Examination* *Make an on-the-ground examination of the corridor in which the road is to be located.* *Verify the control points, critical areas, and resource and management direction identified in the applicable environmental, logging system, travel analysis, and transportation analysis documents and during the office location studies. Identify and document features within or adjacent to the corridor that would affect previous and subsequent decisions.*

[40] USDA Forest Service. 2014. Chapter 7720 – Transportation System Development. Forest Service Manual 7700 on Transportation Management

			If possible, document these features on maps and photos. Consult with appropriate specialists and land managers to resolve conflicts or address specific problems. *22.2 - Location Marking* *Using information from the office location studies and the initial field examination, mark road locations on the ground that conform to those identified on the maps and photos that are compatible with the design criteria and other management direction. It may be necessary to mark more than one location of a road or road segment, especially in the vicinity of critical areas such as topographic features affecting logging systems, landing locations, riparian areas, intersections, switchbacks, and private land. If a new NEPA document is being produced, these alternative locations will be analyzed for effects, according to FSH 1909.15, section 15.41* As noted in this reference, the National Environmental Policy Act influences the selection of the road location and this influence by NEPA is detailed in the Forest Service Handbook as follows: *15 - ESTIMATE EFFECTS OF EACH ALTERNATIVE* *Effects and impacts as used in these regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial. (40 CFR 1508.8(b))* *For each alternative considered in detail, analyze and document the environmental effects, including the effectiveness of the mitigation measures that would result from implementing each alternative, including the no-action alternative.*[42] This required analysis for locating a new road on National Forest Land would provide DEQ with specific BMPs and the level of detail DEQ is seeking to evaluate PCGP's selection a location for a TAR and PAR. DEQ is seeking this information to evaluate PCGP's efforts to protect water quality and comply with TMDL and other Clean Water Act requirements. This represents the level of detail DEQ is expecting from PCGP as they respond to Comment 26 and 27. DEQ's request for more detail on the practices PCGP will employ and engineering PCGP will use to protect water quality is consistent with and supportive of the NEPA process. PCGP should be supporting this NEPA process during its

[41] USDA Forest Service. 2011. Chapter 20 – Road Location. Forest Service Handbook 7709.56 on Road Preconstruction Handbook WO Amendment 7709.56-20111-1

[42] USDA Forest Service. 2012. Chapter 10 – Environmental Analysis. Forest Service Handbook 1909.15 on National Policy Act Handbook 1909.15-2012-3

			application to Federal Energy Regulatory Commission to construct and operate this gas pipeline. Given this NEPA requirement, PCGP should have developed selection criteria for choosing both the need for and the location of new access roads for pipeline construction and operation to minimize impacts to water quality among other concerns as discussed above in DEQ's review of PCGP's response to Comment 26.
28	Additionally, please provide detailed best management practices and design standards for decommissioning the Temporary Access Roads.	Best management practices for construction of temporary and permanent access roads are contained in the Erosion Control and Revegetation Plan in Attachment A, Appendix B.1 of the PCGP JPA package.	**<u>Summary Statement</u>:** The **Erosion Control and Revegetation Plan does not provide site-specific plans describing how PCGP will decommission temporary roads. PCGP should also address how road closures will comply with applicable TMDL Implementation Plans. Please provide site-specific plans for achieving these objectives as described more fully in the following section.** Unused and unmaintained roads are a source of sediment and debris flows into waterways.[43, 44, 45] For this reason, DEQ is requesting that PCGP provide DEQ with the specific road decommissioning treatments for each Temporary Access Road. DEQ reviewed PCGP's Erosion Control and Revegetation Plan and can find no design details and technical support these details in this plan. PCGP has not clearly detailed how PCGP will specifically decommission the 10 segments of Temporary Access Roads. Moreover, DEQ can find no discussion of how PCGP will treat closed Forest Service, BLM, Bureau of Reclamation, Private, and/or County roads that PCGP's project activated for the sole purpose of constructing the pipeline. The Forest Service, BLM, and ODF's Forest Practices Act Program have specific requirements concerning road decommissioning developed, in part, to address water quality impairments from nonpoint source pollution and comply with Total Maximum Daily Loads. In reviewing their requirements along with PCGP's Erosion Control and Revegetation Plan, PCGP has not clearly addressed the decommissioning or closing requirements of these TMDL Designated Management Agencies. To develop its Certification Decision, PCGP must provide DEQ the site-specific details for how it will decommission all Temporary Access Roads as well as close access roads that PCGP's project opened to build this pipeline. Evaluating compliance with Section 303 of the Clean Water Act is a requirement for developing DEQ's Certification Decision. PCGP must demonstrate that a road no longer in use for pipeline construction and/or operation will not become a source of sediment and debris flows into water bodies. As noted above in DEQ's review of PCGP's response to Comment 24, 26, and 27, road closures are often a goal of an agency Total Maximum Daily Load Implementation Plan. The Forest Service defines road decommissioning as "activities

[43] Swanston, D.N. and Frederick J. Swanson. 1976. *Timber Harvesting, Mass Erosion, and Steepland Forest Geomorphology in the Pacific Northwest*. In Geomorphology and Engineering. Dowden, Hutchinson and Ross Editors.

[44] Wolfe, Mitchell Dean. 1982. *The Relationship between Forest Management and Landsliding in the Klamath Mountains of Northwestern California*. Earth Resources Monograph 11, USDA Forest Service Region 5

[45] Elliot, William J. and Laurie M. Tysdal. 1999. *Understanding and Reducing Erosion from Insloping Roads*. Journal of Forestry. 97(8):30-34

			that result in the stabilization and restoration of unneeded roads to a more natural state.[46] As noted in DEQ's review above, the Forest Service uses the Forest Service Manual and Handbook to implement Water Quality Restoration Plans in its efforts to comply with TMDLs. According to this manual, the only road management option for temporary roads is decommissioning. The Forest Service Manual identifies the following five road decommissioning treatments that may be used in combination depending on the particular site: • Blocking entrance • Revegetation and water barring • Removing fills and culverts • Establish drainage ways and remove unstable road shoulders • Full obliteration by recontouring and restoring natural slopes[47] For private forest roads regulated under Forest Practices Act rules, the requirements for vacating these roads are as follows: ***Vacating Forest Roads*** *(1) The purpose of this rule is to ensure that when landowners choose to vacate roads under their control, the roads are left in a condition where road related damage to waters of the state is unlikely.* *(2) To vacate a forest road, landowners shall effectively block the road to prevent continued use by vehicular traffic, and shall take all reasonable actions to leave the road in a condition where road related damage to waters of the state is unlikely.* *(3) Reasonable actions to vacate a forest road may include removal of stream crossing fills, pullback of fills on steep slopes, frequent cross ditching, and/or vegetative stabilization.* *(4) Damage which may occur from a vacated road, consistent with Sections (2) and (3) of the rule, will not be subject to remedy under the provisions of the Oregon Forest Practices Act.*[48] As noted elsewhere in this DEQ review, the Oregon Department of Forestry uses the Forest Practices Act rules to comply with Total Maximum Daily Loads and water quality standards. Jordan Cove must provide DEQ with the site-specific designs and specification for each segment of road that Jordan Cove will decommission after terminal and pipeline construction.
29	DEQ has not completed this review at this time but will consult in the future with other	JCEP and PCGP are actively working with the respective agencies to obtain approvals	**<u>Summary Statement</u>: PCGP's Resource Report 1 describes excess material generated during development as "construction debris", which meets the definition of "demolition and construction materials" found in ORS 459.005(24).**

[46] 36 Code of Federal Regulations §212.1
[47] USDA Forest Service. 2001. 7712.11 – Exhibit 01, Chapter 7710 – Transportation Atlas, Records, and Analysis. Transportation System, FSM 7710-2001-3
[48] Oregon Administrative Rules 629-625-0650

	DEQ programs and other state agencies concerning compliance with other state statutory requirements such as: • Oregon Revised Statute 468B.035 and 105 (Enabling Legislation for Implementing the Coastal Zone Amendments and Reauthorization Act) • ORS 783.620 through 640 and 783.990 through 992 (Ballast Water Management Law) • ORS 466.020, 075, 105, and 195 (Hazardous Waste Management Law) • ORS 196.795 through 990 (Removal-Fill Law) • ORS 496.172 – 496.192 (Oregon Threatened and Endangered Species Act) • ORS 496.012, 496.138, and ORS 506.109 o Fish and Wildlife Habitat Mitigation Policy o In-water Timing and In-water Blasting Permits o ORS 509.585 (Fish Passage Requirements) o ORS 498 (Fish Screening)	outlined to the extent required by law. There are no landfills associated with the PCGP, therefore, ORS 459.005 is not applicable.	PCGP's submittal for a Section 401 Water Quality Certification references in several locations PCGP's plan to identify several disposal sites along the pipeline right-of-way. DEQ is providing PCGP excerpts below of these references to disposal sites. Please review your submittal and revise it to reflect PCGP's most current intent on managing the solid waste from the pipeline construction and operation. Without these revisions, DEQ will assume PCGP will develop and use disposal sites for construction debris. References to proposal sites in PCGP's submittal will require a Construction and Demolition Landfill Permit during the development of DEQ's Certification decision. **1. Overburden and Excess Material Disposal Plan, page 2 and Attachment A, Table 1** **2.3 PERMANENT DISPOSAL LOCATIONS** At permanent disposal sites, excess material will be deposited and treated in a manner that will be agreed upon with the corresponding federal land-managing agencies. PCGP will provide a Site Development and Reclamation Plan that will include surveyed drawings of the permanent disposal sites that identify the storage location of material based on material type and material size for agency approval. The disposal drawings will also show any temporary and/or permanent erosion control measures that may be required. Attachment B – Typical 1 shows the information that would be included in the sample quarry drawing for permanent disposal sites. **Attachment A** **Table 1** **Rock Source and Disposal Sites Identified for Construction of the Pipeline Project on Federal Lands**

Rock Source and/or Permanent Disposal Sites	Size (acres)	Pipeline MP location	Purpose	Jurisdiction	Land Use	Permanent/ Temporary Use	Vegetation	Access
Douglas County								
Signal Tree Road Quarry – Sec. 3 (3430.26-X-0004)	1.22	45.86	Rock source and overburden disposal; spoil storage, staging	BLM-Roseburg district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar (regenerating)	Upper Signal Tree (BLM 28-9-35) 45.85 - 45.92 (3430-31-Y-008)
Signal Tree Road Quarry – Sec. 35 (3430.26-X-0002)	1.09	47	Rock source and overburden disposal	BLM-Coos Bay district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar (regenerating)	Upper Signal Tree (BLM 28-9-35) 45.85 - 45.92 (3430-31-Y-008b)
Weaver Road Quarry Site 1 (3430.26-X-0003)	1.62	47	Rock source and overburden disposal	BLM-Coos Bay district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar	Weaver Road (BLM 28-8-18) 42.03 – 42.50 (3430-31-Y-008b)
Weaver Road Quarry Site 2 (3430.26-X-0003)	1.30	47	Rock source and overburden disposal	BLM-Coos Bay district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar	Weaver Road (BLM 28-8-18) 42.03 – 42.50 (3430-31-Y-008b)
Signal Tree Quarry Site – Sec. 15 (3430.26-X-0005)	1.75	47	Rock source and overburden disposal	BLM-Roseburg district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar	Lower Signal Tree (BLM 29-9-36.0) 46.51 (3430-31-Y-008)
TEWA 79.85-N (BLM Quarry Site) [1]	3.61	79.85	Overburden disposal, PI, spoil storage, log landing, steep slope staging	BLM-Roseburg district	Transportation, communication, utilities corridors, regenerating evergreen forest land; quarries	Permanent or Temporary	Roads, corridors, Douglas fir dominant - mixed conifer	Pack Saddle Road (BLM 29-4-17) 79.89 - 80.42 & Construction Right-of-Way (3430-31-Y-013)
Hatchet Quarry MP 102.30 (3430.26-X-0016)	2.00	102.30	Log (mitigation) storage	FS-Umpqua	Strip mines, quarries, gravel pit and evergreen	Permanent	Industrial	FS 3220000 (3430-31-Y-016c)

	○ ORS 497.298 (Scientific Taking Permit) • ORS 537 (Water Rights Law) • ORS 197 (Oregon Land Use Planning Law) • ORS 390.235 (Permits for Removal of Archaeological or Historical Material) • ORS 569 (Weed Control Law) • ORS 527 (Forest Practices Act) At this time, please provide applications for Construction and Demolition Landfill Permits required under Oregon Revised Statute 459.005 through 418 (Solid Waste Management Law) for the several proposed disposal sites associated with the construction or operation of the gas pipeline.		**2. Sanitation and Waste Management Plan, page 4** **8.0 ROCK REMOVAL/EXCESS OVERBURDEN** FERC's Upland Plan requires the removal of excess rock from the top 12 inches of soil to the extent practicable in all rotated and permanent croplands, hayfields, pastures, residential areas, and other areas as agreed between landowner and PCGP. In these areas, PCGP will clean up excess rock to a condition similar to adjacent portions of the construction right-of-way (e.g., size, density, and distribution of rock) unless the landowner and PCGP negotiate different stipulations. Excess rock and spoil materials will be redistributed along the construction right-of-way in upland areas during restoration regrading in a manner that reflects the original contours and preconstruction drainage patterns. Excess materials will be disposed of in existing quarries and in permanent disposal sites that have been identified along the construction right-of-way. Appendix Q to the POD provides PCGP's Overburden and Excess Material Disposal Plan which describes how these materials will be stored and disposed of on federal lands. (Table A.8-4 in Appendix A.8 to Resource Report 8 of PCGP's Certificate application also identifies the permanent disposal areas that will be located on private lands.) Large rock may be provided to the federal land-managing agencies to be used for instream restoration projects and habitat features. Large rocks and boulders may also be used as OHV barriers along the right-of-way and at road crossings to block access at OHV points to restrict traffic on the right-of-way as described in the Recreation Management Plan (Appendix S to the POD). Additionally, large rocks and boulders may be piled in upland areas along the construction right-of-way to create habitat diversity features where approved by the EI or PCGP's authorized representative and the landowner or land-managing agency. The use of alternate disposal locations will be approved by FERC and, if on federal lands, the respective land-managing agency. **3. Resource Report 1, General Project Description, page 61**

			Excess Rock Removal. FERC's Upland Plan (see Section V.A.3) requires the removal of excess rock from the top 12 inches of soil in cultivated or rotated croplands, hayfields, pastures, residential areas, and other areas at the landowner's request. PCGP will comply with FERC's Upland Plan. In these areas, PCGP will clean up excess rock to a condition (size, density, and distribution) similar to adjacent portions of the construction right-of-way. In rangeland, forestlands, or other non-agricultural or residential lands where shallow bedrock is encountered and rock excavation is required, excess rock will be buried in cuts during restoration to reestablish approximate original contours and scattered across the right-of-way and TEWAs according to landowner agreements. Where excess rock requires disposal, PCGP will consider this material construction debris. The disposal sites have been identified in Resource Report 8, and PCGP will obtain the appropriate approvals prior to use. As noted above, excess rock may be incorporated into habitat diversity structures and stacked or piled along the right-of-way to provide wildlife habitat diversity features to benefit mammals, birds, reptiles, amphibians, and the prey base they depend upon. These habitat features would be created within the Pipeline's certificated construction limits where approved by the EI or PCGP's authorized representative and the landowner or land management agency. These features are also included in Section 10.14 of the ERCP (see Appendix B.1).
31	In compliance with OAR 340-041-0007(8), please provide for DEQ review and approval the resource and land management plans, guidance, design standards, design manuals, access permits or grants, and other programs from the U.S. Bureau of Reclamation that Pacific Connector Gas Pipeline will use to protect water quality during the following: • Siting Temporary and Permanent Access Roads and the construction/permanent right-of-way on U.S. Bureau of Reclamation land, over BOR water-bearing infrastructure (e.g.,	Please refer to the Response to #17. The Klamath Project Facilities Crossing Plan (Appendix E.3 to Part 2 of JPA), which is specific to BOR facilities, is under review as part of the POD and, once approved, would be implemented as part of the Right-of-Way Grant. PCGP is currently working with BOR to provide the necessary information for the federal agencies to issue right-of-way grants for federal lands. An operations and maintenance plan will be prepared if required by the agencies during that process. Proposed amendments and changes to existing BOR resource and land management plans are not	**<u>Summary Statement</u>: Amendments to federal plans that authorize new or modify existing discharge to waters of the state are considered federal authorizations and are, therefore, subject to review by states under Section 401(a) of the Clean Water Act. DEQ requests PCGP identify any proposed amendments and changes to existing BOR resource and land management plans as more fully described in the following section.** See also DEQ's response to Comment 18, above, for related responses to Comment 31. The U.S. EPA is currently reviewing DEQ's Upper Klamath and Lost River Total Maximum Daily Load first issued in May 2010. In this TMDL, DEQ address the impairment of a number of creeks segments by sedimentation and impairment of water bodies by nutrients including nutrient discharge via sediment as follows as follows: *DEQ is not developing a TMDL for a number of creek segments impaired by sedimentation or for biological criteria (Table 1-3). At the time of the writing of this TMDL, DEQ is in the process of developing a sedimentation assessment methodology that could be used for implementing the narrative sedimentation standard and possibly the biological criteria impairment, as well. When the methodology and associated guidance is completed, the agency will establish sedimentation TMDLs for those waterways on the 303(d) list. (page 11)* Given these pending TMDL actions, DEQ is requesting specific information from PCGP in the form of road design standards and specifications, road maintenance standards and specification, and – if appropriate – the technical support for these engineering designs. DEQ is requesting specific information from PCGP in the form of design standard and specification and engineering designs with their technical support for treating stormwater discharge from the pipeline's permanent right-of-way to BOR operated water conveyance structures connected to waters of the state.

	canals), or paralleling this infrastructure. • Maintaining both Temporary and Permanent Access Roads for pipeline construction and operation. • Siting other components necessary to construct and operate such as staging areas, material storage areas, and other components (e.g., compressor stations, metering stations) of the pipeline. • Installing the construction and permanent right-of-way for the gas pipeline. • Operating the permanent right-of-way for the pipeline. Please identify any proposed amendments and changes to existing BOR resource and land management plans and other documents noted that are necessary to construct, use, or maintain access roads and the permanent right-of-way on BOR land.	prerequisites for issuing a 401 Water Quality Certification.	DEQ reviewed the Klamath Project Facilities Crossing Plan referenced in PCGP's response to Comment 31 and finds the following information gaps relevant to DEQ's Comment 31: • Information on how PCGP will manage all BOR access roads (including the 25 Permanent and Temporary Access Roads) while in use to construct and operate the pipeline such as the: o Inventory method PCGP uses to evaluate the current condition of existing BOR roads and current capacity to protect water. o Need for maintenance treatments prior to use by PCGP based on the inventory discussed above. o Design standards and specifications for reconstruction that PCGP will use to ensure PCGP improves these access roads if the above inventory identifies needed improvements to protect water quality under the proposed use (e.g., durable surfacing for non-paved roads, cross drains etc.). o If applicable, design standards and specifications that PCGP will use to ensure PCGP constructs proposed Permanent Access Roads and Temporary Access Roads to protect water quality. o Standards and specifications for maintenance that PCGP will use to ensure existing and proposed new BOR. • Information on the selection criteria PCGP used to site the proposed PARs and TARs on BOR land if applicable. • Information provided to BOR in a Use Authorization Application and the Application for Transportation and Utility Systems and Facilities on Federal Lands as described in the directions for this application and highlighted below in DEQ's review of PCGP's response to Comment 31.[49, 50, 51] • Information referenced in Section 6.0 (Environmental Considerations) of the Crossing Plan that is relevant to Plans of Development (e.g., Transportation Management Plan, Erosion Control and Revegetation Plan) but lacking sufficient information for DEQ to use in its Certification decision as noted above in DEQ's review of PCGP's response to DEQ's comments in AIR-1 (e.g., Comment 15). • Information on the designs standards and specifications as well as engineering designs PCGP will use to construction stormwater treatment controls for the post-construction stormwater discharge to the BOR water conveyance structures connected to waters of the state. DEQ needs to review all easements, agreements, access/right-of-way grants, authorizations, and permits that are established to construct and operate this pipeline on all federal and nonfederal land. DEQ's receipt of this requested information and its evaluation by DEQ is required under OAR 340-048-0042(2) while developing a Certification Decision. DEQ will review and evaluate all final designs as well as standards and specifications – such as those referenced in the Klamath Project Facilities Crossing Plan and associated design package – as part of the required Certification Decision.

[49] Standard Form 7-2540 (09/30/2015). Bureau of Reclamation Use Authorization Application. OMB Control No.: 1006-0003

[50] Standard Form 299 (Revised 5/2009). Application for Transportation and Utility System and Facilities on Federal Lands. Prescribed by DOI/USDA/DOT under Public Law 96-487 and Federal Register Notice 5-22-95

[51] USDI Bureau of Reclamation Website. Last Updated 10/18/17. What do I have to do to apply?

			At minimum, DEQ anticipates receiving the information PCGP provides in response to the application requirements in BOR's use authorization application and the application for transportation and utility systems and facilities. DEQ provides examples below of the minimum level of detail DEQ is seeking from PCGP that BOR initially requires when an entity seeks to use BOR land, resources, and facilities. Depending on the potential level of impact to water quality, this minimum level of information may not be sufficient to develop a Certification Decision. However, the information provided in PCGP's submittal to date lacks the level of detail required for a BOR use authorization application and an application for transportation and utility system and facilities. For timber harvesting, removal of commercial forest products, and use of BOR roads, the BOR Use Authorization Application requests the following information: *4. Location of the proposed use. Submit two copies of all maps or drawings and other information clearly demonstrating the location for the proposed use, including township, range, and section. Under 43 CFR 429.13(a), Reclamation may request additional information needed to process your application, such as legal land descriptions and detailed construction specifications.* 5. *Description of the proposed use. Examples of additional information to provide, depending upon the use, are as follows:* *• maximum number of anticipated participants/spectators/crew;* *• number and types of vehicles to be on site;* *• description of props, tents, tractors, trailers, and other equipment;* *• description of facilities you intend to provide, such as sanitation facilities, emergency personnel, food services or vendors, or other applicable information (attach plans); and* *• description of your intended use of Reclamation on-site roads or trails.* In its Application for Transportation and Utility System and Facilities on Federal Lands, for example, BOR will require or has required the following from PCGP for its proposed pipeline and roads: *7. Project description (describe in detail): (a) Type of system or facility, (e.g., canal, pipeline, road); (b) related structures and facilities; (c) physical specifications (Length, width, grading, etc.); (d) term of years needed: (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction (Attach additional sheets, if additional space is needed.).* *13. a. Describe the reasonable alternative routes and modes considered.* *b. Why were these alternatives not selected?*

			SPECIFIC INSTRUCTIONS (Items not listed are self-explanatory) *7. Attach preliminary site and facility construction plans. The responsible agency will provide instructions whenever specific plans are required.* *13. Providing information on alternate routes and modes in as much detail as possible, discussing why certain routes or modes were rejected and why it is necessary to cross Federal lands will assist the agency(ies) in processing your application and reaching a final decision. Include only reasonable alternate routes and modes as related to current technology and economics.* Consistent with DEQ's comments in AIR-1 and its review of PCGP's response to AIR-1, DEQ will need to know if PCGP inventoried/investigated the current condition of BOR roads for their proposed use. As noted elsewhere in this review, this inventory is important to evaluate potential impacts to water quality from this proposed use. PCGP can use the Geomorphic Road Inventory and Assessment Package (GRAIP) or a comparable analytical tool if approved by DEQ to perform this inventory. DEQ will also need to know that PCGP uses this inventory/investigation to identify maintenance treatments or road improvements necessary to protect water quality. Finally, DEQ anticipates that BOR will provide PCGP with the design standards and specifications applicable to BOR road maintenance, reconstruction, and construction projects. If DEQ provides these design standards and specifications, DEQ will review and – if needed – make modifications and addition to these during the development of a Certification Decision. If BOR does not provide these standards and specifications, DEQ expects PCGP to propose road maintenance, reconstruction, and construction standards and specification for DEQ review and approval.
32	The scope of work in Pacific Connector Gas Pipeline's August 31, 2017 Thermal Impacts Assessment suggests that PCGP evaluated only stream crossings for their potential to influence or regulate thermal properties of streams. • An analysis of the impacts from the 50-foot setbacks from waterbodies in riparian areas currently	The most recent version of the Draft Thermal Impact Assessment plan was provided to ODEQ as Attachment C / Appendix Q.2 of 404-10 JPA Part 2 provided as Appendix B of 2/6/18 401 WQ Package. PCGP is assessing all areas that may fall within riparian areas (one site potential tree height) that are outside the stream crossings listed in the Thermal Impact Assessment. Following receipt of ODEQ's comments on the Thermal	Please provide DEQ with an estimated schedule for the revision to the thermal analysis. PCGP should identify all the impacts to riparian vegetation that PCGP did not consider in its August 31, 2017 draft Thermal Impact Assessment. PCGP should also account for the effects of all cleared areas (e.g., TEWA, parallel stream-pipeline alignment, etc.) that were not previously included in the thermal load analysis.

	proposed for the Temporary Extra Work Areas. • An analysis of the impacts from siting the pipeline alignment within riparian areas as close as 15 feet from streams as currently proposed when paralleling these waterbodies. • An analysis of the impacts from siting Temporary and Permanent Access Roads, Staging Areas, material storage area, and other pipeline components (e.g., compressor stations, metering stations) within riparian areas. DEQ is requesting this clarification because the scope of work from the Thermal Impacts Assessment suggests that the estimate of solar loading for stream crossings under both the construction (i.e., 75-95 foot wide) corridor and the permanent (i.e., 30-foot wide) corridor using the Shade-A-Lator tool did not consider the impact of these TEWAs. The use of TEWAs during pipeline construction extends the construction corridor beyond 75 and 95 feet. Currently, the Pacific Connector Gas Pipelines	Impacts Assessment, updates or revisions to the assessment will be completed at that time.	

	proposes to site TEWAs 50 feet from waterbodies as noted in the comment above. In addition, the scope of work in this assessment does not indicate PCGP evaluated the influence on stream thermal properties when the pipeline's construction and permanent corridor closely parallels streams and comes within 15-feet or less of these streams. For a comprehensive analysis of PCGP's compliance with the temperature standard, PCGP's Thermal Impact Assessment must also evaluate these impacts as well as other impacts (e.g., roads, staging areas etc.) as requested in the comments above on compliance with Section 303 of the Clean Water Act.		
33, 34, 35, 36	Comment 33: In compliance with OAR 340-041-0007(1) and (7), please provide a post-construction stormwater management plan addressing DEQ's *Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines* for all the road	The JCEP 401 Water Quality Memorandum (Part 1) and PCGP 401 Water Quality Summary Table (Part 2, Appendix A) in the application specifically address project compliance with Oregon water quality standards.	**Summary Statement: The responses provided by PCGP do not fully address the information requested by DEQ. Please provide the information requested in Comments 33 through 36 and more fully described in the following section. See also DEQ's Summary Statements related to Comments 4, 5, and 15 for additional guidance.** **Comment 33 of DEQ's AIR-1 (Road Stream Crossings PCGP Will Improve)** In its response to Comment 33, PCGP has not address guidance materials found in DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines. DEQ requested this information to evaluate fully PCGP's actions to treat the discharge from roads at stream crossings such as culverts and bridges. DEQ is requesting this information since these stream crossings serve as a discharge point for sediment arising from the travel ways, cut slopes, and in-slope ditches of non-paved roads.[52] The information regarding the

[52] Holley, A. Gordon, A. Gordon; Conner, Kristina F.; Haywood, James D., eds. 2015. *Sediment Deposition from Forest Roads at Stream Crossings as Influenced by Road Characteristics*. Proceedings of the 17th Biennial Southern Silvicultural Research Conference. General Technical Report. SRS-203. Asheville, NC: U.S. Department of Agricultural Forest Service, Southern Research Station. 551 p.

	stream crossings that Jordan Cove Energy Project and Pacific Connector Gas Pipeline will: • Replace or improve to construct and/or operate the gas pipeline and • Result in an increase in impervious surface area during the replacement/improvement process. This information is necessary [see OAR 340-048-0042(2)(a)] to determine whether the stormwater discharge from the pipeline's road stream crossings will contribute to or cause violations of water quality standards. Comment 34: In compliance with OAR 340-041-0007(1) and (7), please provide a post-construction stormwater management plan addressing DEQ's *Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines* for all stream crossings for the pipeline. The focus of this plan	Details pertaining to post-construction stormwater management for the pipeline are provided in the PCGP Erosion Control and Revegetation Plan (Part 2 Attachment A / Appendix B.1 of 404-10 JPA Part 2 provided as Appendix B of 2/6/18 401 WQ Package). The general location maps showing proposed access roads are referenced in Appendix G.1 to Resource Report 1 (Part 2 Attachment A of 404-10 JPA provided as Part 2 Appendix B of 2/6/18 401 WQ Package, see pdf pages 183 and 661). The waterbodies within 100 feet of existing roads needing improvement are detailed in Table A.2-6 in Appendix A.2 of Resource Report 2 (Part 2 Attachment C / Appendix A.2 of 404-10 JPA provided as Part 2 Appendix B of 2/6/18 401 WQ Package). Table A.2-6 will be updated to include the water quality BMPs for each crossing and provided to ODEQ in Q4 2018. Further, impacts associated with vegetation removal are detailed in the PCGP Revised	design of these stormwater treatment systems requested in these submission guidelines enables DEQ to evaluate the efficacy of PCGP's proposed stormwater treatment controls. Given the potential for pollutant discharge at stream crossings, DEQ is requesting the engineering designs and technical support for each water quality BMP proposed for each stream crossing that PCGP proposes to identify in a future update to Table A.2-6 in Q4 2018. DEQ will not accept a qualitative description of a treatment practice in lieu of these engineering designs and their technical support. Even for a simple stormwater treatment control such as a grass swale, several design variables influence the performance of a grass swale. For example, a simple statement that PCGP will use a grass swale to treat the roadside ditch runoff prior to discharge to a stream provides DEQ no information regarding the pollutant removal performance for this swale. As an illustration for PCGP's consideration in preparing to submit information to DEQ, Minton 2005 provides a brief discussion of these design variables for a grass swale in the following excerpt: *Although grass swales are commonly viewed as filters (biofiltration), they are properly classified as shallow basins or biosettlers. Flow-through grass swales function as treatment devices if vegetation remains erect. Erect grass reduces shear stress in the channel, reducing its capacity to carry sediment. Careful selection of the Manning's n is critical to proper sizing (Chapter 5).* *Length was first established at 200 feet (60 m) based on a study of a grass-lined freeway ditch. 60 percent of the TSS was removed in 100 feet and 80 percent in 200 feet. More recently, others have specified a minimum length of 100 feet combined with a minimum hydraulic residence time of 9 minutes. The specified residence time results in lengths considerably greater than 100 feet.* *…Swales and strips designed for treatment appear to give reasonable performance, on the order of 70 to 80 percent TSS removal if the hydraulic residence time is on the order of 10 minutes.*[53] A table of water quality BMPs employed at stream crossing without corresponding engineering analysis and its technical support will not allow DEQ to evaluate the potential water quality impacts from the stormwater discharge at these stream crossings. In developing the Certification Decision, DEQ must evaluate all proposed activities that would either contribute to or cause violations of water quality standards from road drainage discharged at stream crossings [OAR 340-048-0042(2)(a)]. To perform this evaluation, DEQ needs PCGP to submit a quantitative assessment using, for example, models and/or engineering designs and the technical support for these designs.

[53] Minton, Gary. 2005. *Stormwater Treatment – Biological, Chemical and Engineering Principles*. Sharidan Books, Inc.

	should be the drainage area for the right-of-way approaches that discharge stormwater into the stream crossing. To ensure compliance with OAR 340-048-0042(2)(a), please evaluate if the discharge from the pipeline's permanent 30-foot right-of-way at all stream crossings for the pipeline will contribute to or cause violations of water quality standards. In compliance with OAR 340-048-0042(2)(a), please propose the analytical model(s) (e.g., X-DRAIN) that Pacific Connector Gas Pipeline will use to evaluate if the stormwater discharge from the permanent 30 foot right-of-way with its 10 feet of compacted soil overlying the gas pipeline will contribute to or cause violations of water quality standards. In compliance with OAR 340-041-0002(1), this evaluation must also consider the impact of the change in stormwater volume discharged to receiving waters from the vegetation conversion (i.e., from forest canopy to herbaceous vegetation) during pipeline	Draft Thermal Impact Assessment (Part 2 Attachment C / Appendix Q.2 of 404-10 JPA provided as Part 2 Appendix B of 2/6/18 401 WQ Package).	**<u>Comment 34 of DEQ's AIR-1 (Permanent Right-of-Way Post-construction Discharge at Stream Crossings)</u>** In its response to Comment 34, PCGP did not provide DEQ with the information requested in DEQ's *Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines*. As discussed in DEQ's review of PCGP's response to DEQ's Comment 16 and again emphasized below, the permanent right-of-way for the pipeline will have areas of compacted soil particularly over the gas pipeline. Given this, the permanent right-of-way is essentially functioning as primitive road as the compacted soil above the pipeline is serving as a travel way. Compacted soil will limit stormwater infiltration and promote surface runoff. As a result, PCGP must treat the stormwater at the crossing of each pipeline right-of-way prior to its discharge into streams. As noted elsewhere in DEQ's review of PCGP's response to AIR-1, road stream crossings are a source of pollutant discharge. The proposed slope breakers or water bars noted below are serving as this primitive road system's cross drains for stormwater. Given this fact, DEQ draws upon the numerous studies on the impact of roads on receiving water quality to anticipate the potential water quality impacts from PCGP's proposed right-of-way. One of these studies, referenced elsewhere in DEQ's review of PCGP's proposal, summarizes DEQ's concerns as follows: *If there is a moderate distance between the road and stream, then mitigation to reduce both road erosion and channel erosion may decrease sediment delivery. Channel treatment options include lining the channel with rock or similar materials, establishing vegetation, or installing control structures. These mitigation techniques are expensive and may be ineffective during severe runoffs.* (Elliot 1999). PCGP is proposing the use slope breakers discussed and presented below to manage stormwater on the permanent right-of-way for the gas pipeline. A slope breaker is essentially a stormwater ditch (see drawing below) with a berm to control the direction of stormwater flow. Slope breakers represent a potential hydrological connection between streams and the permanent right-of-way when these slope breakers are located near stream crossings. PCGP must propose to DEQ a defensible approach to treating any pollutants mobilized in the permanent right-of-way, transported in the ditches of slope breakers, and discharged near stream crossings. Unless PCGP can provide the engineering analysis to demonstrate otherwise, DEQ considers the proposed slope breakers near stream crossings to be stormwater conveyance systems rather than stormwater treatment systems. As noted above, compacted soil will limit the infiltration of stormwater. Raindrop splash erosion on bare soil and stormwater moving downslope will mobilize sediment where soil is exposed and/or compacted and vegetation is limited due to this compaction around the pipeline. Moreover, PCGP's proposed vegetation maintenance for pipeline right-of-way will limit the extent vegetation types allowed in the right-of-way particularly above and adjacent to the gas pipeline. PCGP's response to Comment 34 did not address DEQ's request to evaluate the discharge from this permanent 30-foot right-of-way with its 10-feet, at minimum, of compacted soil overlying the pipeline. During its

	construction. The evaluation of this impact is necessary to determine if pipeline's permanent right-of-way will cause bed and bank erosion and, therefore, violate Oregon's biocriteria water quality standard (i.e., OAR 340-041-0011). Comment 35: In compliance with OAR 340-041-0007(1) and (7), please provide a post-construction stormwater management plan addressing DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines for the 30-foot permanent right-of-way for the approximately 117 miles of the proposed pipeline right-of-way traversing steeps slopes (i.e., slopes greater than 30%). This information is necessary before Pacific Connector Gas Pipeline, in compliance with OAR 340-048-0042(2)(a), can determine whether the discharge from the pipeline right-of-way will contribute to or cause violations of water quality standards. The information provided in PCGP's documents (e.g., 401 Application Submittal, drafts of		review of proposed federal resource and land management plans, DEQ confirmed its concern regarding post-construction stormwater discharge from slope breakers at stream crossings carrying sediment from compacted soil. DEQ documents this concern in DEQ's review of PCGP's response to Comment 16 presented above. PCGP will need these amendments to federal soil compaction standards to build the gas pipeline. The application of a model such as X-DRAIN will help PCGP estimate the level of sediment discharge from the proposed permanent right-of-way. In AIR-1, DEQ requested from PCGP this quantitative evaluation to develop DEQ's Certification Decision. However, PCGP has not indicated in its response to AIR-1 that this evaluation is forthcoming. In formulating a Certification Decision, DEQ must determine if the potential alterations to water quality would either contribute to or cause violations of water quality standards [OAR 340-048-0042(2)(a)]. As noted above, a slope breaker installed near stream crossings is a stormwater conveyance component rather than a stormwater treatment component unless PCGP provides the engineering analysis to demonstrate otherwise. Moreover, DEQ does not see how PCGP's updating Table A.2-6 with brief, qualitative descriptions of water quality BMPs will provide the engineering design and its technical support that DEQ is requesting from PCGP. In PCGP's response to Comment 34, PCGP refers DEQ to PCGP's proposed Erosion Control and Revegetation Plan. In this plan, PCGP provides a description of its permanent post-construction stormwater control referred to a "permanent slope breakers (waterbars)." Below, DEQ provides an excerpt of this description as well as design details for slope breakers. This description and design details do not provide the information to answer the following questions: • Is PCGP proposing to install slope breakers/water bars in floodplains? o Will these installations trigger local government floodplain regulations and, if yes, will these installations comply with these land use regulations or prevent the signing of a required Land Use Compatibility Statement. o If PCGP does not intend to use slope breakers in floodplains, how is PCGP proposing to manage post-construction stormwater in floodplains. • What is PCCP's proposed setback from the Army Corps of Engineer's and Oregon Department of State Land's ordinary high water mark for permanent slope breakers? o How will PCGP infiltrate (i.e., treat) the discharge from the slope breaker installed above this setback during periods of rainfall, high groundwater table, saturated soil conditions reducing infiltration of runoff, and a limited vegetation buffer to treat surface runoff? o How will PCGP manage post-construction stormwater and provide treatment for this stormwater within this setback? ▪ Is PCGP proposing to infiltrate (i.e., treat) the runoff within the setback during periods of high rainfall, high groundwater table, and saturated soil conditions or will this runoff discharge into streams untreated as surface runoff into streams?

	Resource Reports) – made available to DEQ – only provides generic diagrams and erosion controls practices. DEQ can find no information on PCGP's field investigations or remote sensing for these areas to evaluate slope stability when siting the pipeline alignment. DEQ can find no information on the specific designs and practices that PCGP will use on cut slopes and fill slopes located on these steep slopes. In developing this plan in compliance with OAR 340-041-0007(1) and (7), please provide information on the designs and engineering support for these designs for the permanent controls Pacific Connector Gas Pipeline proposes to stabilize cut-slopes and fill slopes for the right-of- way sited along the steep slopes. The purpose of these controls is to prevent sediment discharge in stormwater and debris flows from landslides discharging into streams. Please note these on the post-construction stormwater plan in the information request above. Additionally, please identify where the 117 miles of proposed pipeline noted above		• If PCGP will setback slope breakers from the ordinary high water mark to comply with Corps and DSL permit requirements, how will the discharge from these slope breakers prevent hydromodication of smaller streams and, therefore, bed and bank erosion in these streams with its effect on Oregon's biocriteria?

4.2.2 Permanent Slope Breakers

Permanent slope breakers (waterbars) will be installed across the right-of-way on slopes. The purpose of these structures is to minimize erosion by reducing runoff velocities by shortening slope lengths, preventing concentrated flow, and by diverting water off the right-of-way. Slope breakers are also intended to prevent sediment deposition into sensitive resources.

Slope breakers will be constructed with a two to eight percent outslope so that water does not pool or erode behind the breaker. Outflow will be diverted to a stable area off the right-of-way consistent with FERC's Upland Plan. Slope breakers may extend slightly (about 4 feet) beyond the edge of the construction right-of-way to effectively drain water off the disturbed area. If a stable area is not present, a temporary energy-dissipating device will be installed at the end of the slope breaker.

Slope breakers will be installed along the right-of-way based on slope gradient and soil characteristics (see Table 4.2-2). The frequency of slope breakers will be installed based on a combination of FERC's Upland Plan (see Attachment A) and input from the Forest Service and BLM. Because of the range in variation between agency recommendations and because of the complex landownership pattern, a single slope breaker spacing was developed based on slope gradient and soil type to ensure installation practicality across the various private and federal lands. The permanent slope breakers will be installed in all areas except agricultural fields, hayfields, pastures, and lawns. A typical drawing of a slope breaker is provided in Attachment C as Drawing 3430.34-X-0008.

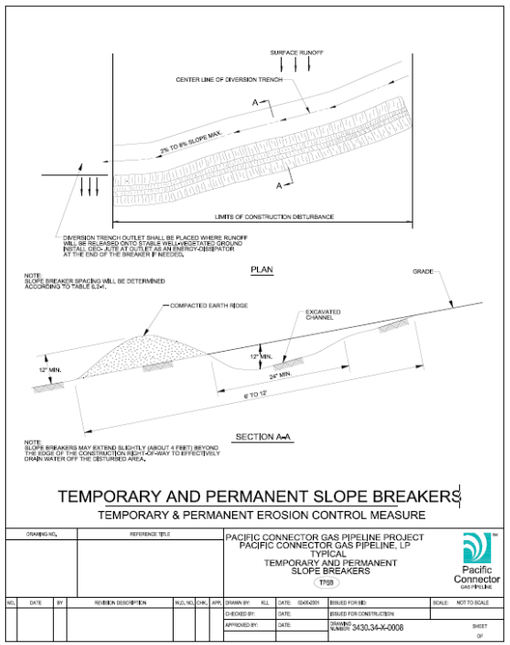
Table 4.2-2
Permanent Slope Breaker Spacing

Slope Percent	Spacing Based on Soil Characteristics[1]	
	Highly Erosive Granitic Soils[2] (feet)	Moderate/Low Erosion Soil Types (feet)
0-5	None Required	None Required
>5-15	100	200 to 300
>15-30	50 to 75	75 to 100
>30	50	50

[1] Actual spacing will be determined at the time of installation based on site-specific topographic conditions on the right-of-way to ensure proper slope breaker construction and proper drainage to stable off-site areas. On the Umpqua National Forest between about MPs 109 and 110, where the alignment crosses the historic Thomason cinnabar claim group, waterbars are to be installed at 50-foot intervals as recommended by the Forest Service (see the Contaminated Substances Discovery Plan/Appendix E of the POD).

[2] Granitic formations are crossed by the alignment between about: MPs 79.1 to 80.5; 81.6 to 82.2; 87 to 88.8; 97.0 to 101.2; 103.0 to 105.4; and 114.8 to 115.

Section 4.2.2 on Slope Breakers from PCGP's Erosion Control and Revegetation Plan



Drawing Number 3430.34-X-0008 of Slope Breakers

DEQ is seeking answers to the questions above because PCGP has provided limited information on its proposed post-construction stormwater controls at the stream crossings of the permanent right-of-way. In Comment 34, DEQ requested PCGP use DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines. Using these guidelines would provide DEQ with information needed to evaluate the efficacy of PCGP's proposed use of slope breakers at stream crossings. For example, PCGP is proposing to discharge stormwater from slope breakers and, presumably, infiltrate this discharge into the surrounding soils for treatment. According to DEQ submission guidelines for a post-construction stormwater management plan, the PCGP should design structural controls for any conditions that warrant special water quality considerations such as:

	coincide with the 94 miles of the proposed pipeline that would be located in soils that PCGP has identified as having a high or severe erosion potential. Please provide the designs and engineering support for these designs for the permanent controls in these areas of high/severe erosion potential and steep slopes. In compliance with OAR 340-041-0007(1) and (7), the engineering support must indicate that these permanent controls are sufficient to: • Manage stormwater to prevent erosion on the permanent right-of-way, its cut-slope, and its fill-slope. • Prevent debris flows into streams from landslides from cut-slope and fill-slope failures. On the post-construction stormwater management plan requested above, please also provide the location for these controls along the 117 miles of pipeline on steep slopes (>30%).		• *Size infiltration structural stormwater controls such that there is sufficient depth to groundwater to facilitate drainage (e.g., soil pore storage volume ≥ volume of stormwater designed to infiltrate (Table 2, page 19).* • *The bottom of the structural stormwater control should be sufficiently above the highest anticipated seasonal groundwater to facilitate drainage. Generally, the volume of the post-construction stormwater runoff the structural control is designed to infiltrate should not exceed the storage volume within the soil pores of the subgrade (Section E.7.2.1, page 20).* PCGP's references the proposed Erosion Control and Revegetation Plan in its response to Comment 34. However, this plan does not provide any details regarding the natural area or structural controls PCGP intends to install to infiltrate stormwater discharged from slope breakers near stream crossings. PCGP does not provide any infiltration testing for the area receiving the slope breaker discharge as requested in Section E.3 of DEQ's submission guidelines. PCGP does not provide DEQ with any design criteria such as those suggested by Pazwash 2016. For example, Pazwash provides the following example criteria for a filtering system: *…the entire treatment system (including pretreatment) hold at least 75% of the WQ_v prior to infiltration. Minimum filter bed thickness is typically 18 in (45cm) for infiltration basins and 12 inches (30 cm) for sand filters. e. Swales: Swales are designed to treat the full WQ_v and may be dry swale or wet swale…Dry swale is basically a vegetated open channel, and wet swale has an expanded basin with wetland vegetation and constricted outlet. Figure 5.6 shows a schematic plan view of a wet swale. Design criteria for swales (open channel) area:* 1. *Swales shall be designed for the 10-year storm.* 2. *The peak flow velocity for the 10-year storm shall be nonerosive.* 3. *Channels will have moderate side slopes (flatter than 3:1) – in no case, steeper than 2:1.* 4. *A minimum ponding time of 30 minutes is recommended for WQv treatment. The maximum allowable ponding time shall be less than 48 hours. An underdrain system shall be provided in dry swales to meet the maximum ponding time requirement.*[54] PCGP provides none of the detailed information provided in the example above for how PCGP will manage and treat the stormwater discharge from slope breakers at stream crossings. Without additional information, PCGP is essentially asking DEQ to accept – without any engineering analysis or technical support – that the soils and vegetation in between the slope breaker's discharge point and the stream will treat this stormwater discharge. Additionally, when the permanent right-of-way is in operation, PCGP does not provide DEQ with the water quality

[54] Pazwash, Hormoz. 2016. *Urban Storm Water Management* (Second Edition). CRC Press

	Comment 36: In compliance with OAR 340-041-0007(1) and (7), please provide post-construction stormwater management plans for the proposed 25 miles of new permanent and temporary roads addressing DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines. This information is required before Pacific Connector Gas Pipeline can determine whether the discharge from these new roads will contribute to or cause violations of water quality standards. In compliance with OAR 340-048-0042(2)(a), please propose the analytical model(s) (e.g., X-DRAIN) that Pacific Connector Gas Pipeline will use to evaluate if the stormwater discharge from these 25 miles of proposed new roads will contribute to or cause violations of water quality standards.		design storm that the proposed slope breaker collection system and/or natural area will treat. Moreover, PCGP does not demonstrate that the natural area (i.e., buffer area) between stream and the slope breaker's discharge point is capable of adequately treating the discharge from the water bar. In the absence of this detailed information, DEQ can only assume that PCGP does not sufficiently treat the runoff from the permanent right-of-way at stream crossings once discharged from the slope breaker to the stream. In Comment 34, DEQ requested that PCGP evaluate the water quality impacts from this discharge by using a model such as X-DRAIN. PCGP has not provided this evaluation in its response nor indicated it will provide this information to DEQ in the near future. **Comment 35 of AIR-1 (Post-construction Stormwater Discharge from ROW to Steep/Unstable/Erosive Slopes** In PCGP's response to DEQ's Comment 35, PCGP refers DEQ to the Erosion Control and Revegetation Plan. As noted in DEQ's Comment 35, PCGP only provides generic diagrams for certain erosion control practices. This information does not provide site-specific information for how PCGP will avoid discharging post-construction stormwater to unstable slopes such as headwalls, Areas of Potential Rapidly Moving Landslide Hazards, and mapped landslides along the entire pipeline alignment. In DEQ's review of PCGP's response to Comment 15 noted above, DEQ provides the regulatory and technical basis for avoiding post-construction discharges to steep, unstable slopes from the pipeline's right-of-way. For example, in its Erosion Control and Revegetation Plan, PCGP indicates that it will use permanent slope breakers (i.e., water bars) across the right-of-way on slopes to: *…minimize erosion by reducing runoff velocities by shortening slope lengths, preventing concentrated flow, and by diverting water off the right-of-way. Slope breakers are also intended to prevent sediment deposition into sensitive resources.* DEQ addresses the deficiencies of this plan excerpt from the ECRP in DEQ's review of PCGP's response to Comment 34 above. This represents all the information PCGP provided to DEQ in its submittal. The information that PCGP has provided in its submittal, to date, lacks site-specific information regarding the discharge points for these slope breakers. Also, without additional information, DEQ is unable to determine if these discharge points will: • Add additional water to unstable slopes (e.g., headwalls, high Rapidly Moving Landslide Hazard Potential Areas, mapped landslides) • Produce positive soil pore pressures that may cause landslides that impact water quality. As noted PCGP's submittal, slope breakers are specialized drainage ditches to prevent stormwater from eroding the right-of-way and creating rills and gullies in this right-of-way. PCGP's response did not provide DEQ with a post-construction stormwater management plan for the management of stormwater for the approximately 117 miles of the proposed pipeline right-of-way traversing steeps slopes (i.e., slopes greater than 30%).

			Technical Basis for DEQ's Information Request In a discussion of slope stability and linear infrastructure such as roads, Benda et al. 2007 notes the following: *Surface runoff that is concentrated and diverted through ditches onto steep slopes can saturate soils or road fills much more than natural intense precipitation events (Megahan, 1972; Sidle et al., 1985), thus increasing the potential for landsliding and/or gully initiation (e.g., Montgomery, 1994; see Figure 31).* *Road drainage that is diverted onto hillslopes is a major factor in landslide initiation (Figure 32 and Table 2). Ditch water that is diverted into naturally landslide-prone bedrock hollows (such as is shown in Figure 1) can trigger shallow landslides and initiate debris flows.* *…Figure 34 illustrates how the design of road drainage can lead either to landsliding or reduce the likelihood of landsliding.* Moreover, drawing on geotechnical experts, research, and references, the USDA Forest Service stresses the role of water in the cause and mitigation of landslides as follows: *There are two categories of water with which we will be concerned: surface water and ground water. Concentrations of surface water, seeps, springs, and vegetation changes indicate topographic changes that can provide critical clues about what may be happening with the ground water.* *Water plays a very important role in the cause and mitigation of most landslides. It is important to learn as much as possible about surface water and ground water because changes in ground water levels and pore water pressures alter effective normal stress and, as a result, modify shear strength.* *It is therefore critical that the source of ground water, changes in ground water levels, and the relationships among surface water, ground water, and the local geology be understood if landslide activity is to be managed.*[55]

[55] Hall, David E., Michael T. Long, and Michael D. Remboldt (Editors). 1994. Slope Stability Reference Guide for National Forests in the United States Volume III. USDA Forest Service EM-7170-13. Washington, DC

			PCGP is proposing to clear ridgetops of trees and other vegetation in Tyee Core Area, other locations with mapped landslide features, steep slopes, and slopes with soil that has a high erosion potential. PCGP is also proposing to level these ridgetops to install a gas pipeline. These activities dramatically alter the interception of rainfall from trees and the movement of stormwater on these ridgetops. These alterations will result in a substantial increase in stormwater generated on these ridgetops relative to their undisturbed condition. However, PCGP has not provided DEQ with specific information for how PCGP will manage the stormwater generated on these ridgetops supporting the permanent right-of-way. As highlighted in references DEQ presented above, stormwater discharge has the potential to cause landslides. Landslides caused by stormwater discharge from pipeline construction activities and the operation of the permanent pipeline right-of-way have the potential to migrate into stream channels affecting water quality. As discussed in DEQ's review above, the permanent right-of-way for the pipeline is functioning as a primitive road. To ensure compliance with OAR 340-041-0007(1) and (7), DEQ is requesting additional information that PCGP would generate during the development of a post-construction stormwater management plan for its permanent right-of-way. DEQ provides guidelines for the development of a post-construction stormwater management plan. For example, in Section E.2.2 of DEQ's *Post-Construction Stormwater Management Plan Submission Guidelines*, DEQ requests that applicants seeking a 401 Water Quality Certification perform the following actions: *Check the topography and Oregon Department of Geology and Mineral Industries' Statewide Landslide Information Database (http://www.oregongeology.org/sub/slido/index.htm).* *Consult with an Oregon-registered geotechnical engineer or engineering geologist in areas with steep slopes or landslide risk to see if excavation and/or infiltration should be avoided.* Since stormwater discharge may cause a landslide as noted above, DEQ provides the above post-construction stormwater plan guidelines to project proponents in DEQ's effort to administer statewide narrative criteria OAR 340-041-0001(1). PCGP has not demonstrated to DEQ that it has selected appropriate discharge points for its slope breakers/water bars to avoid stormwater discharge to unstable slopes. In the limited field investigations for landslides that PCGP has performed (i.e., PCGP's Submittal, Part 2, Appendix C) and discussed in DEQ's review below, PCGP's focus was primarily on the potential risk to the pipeline and did not include a comprehensive evaluation of the risk to water quality. Moreover, the limited field investigations only evaluated the risk of deep-seated landslides and not shallow rapidly moving landslides. PCGP did not perform field investigations for landslide risks for constructing and operating this gas pipeline along the many miles of potential rapidly moving landslide hazards particularly in the Tyee Core Area. ***Examples of Information Lacking in PCGP's Erosion Control & Revegetation Plan***

			PCGP has not provided DEQ with a post-construction stormwater management plan as requested in Comment 35 addressing the plan submission guidelines noted above. PCGP has not demonstrated in its ECRP that it will strategically divert stormwater from the right-of-way to stable and non-convergent slopes. In DEQ's Comment 35, DEQ requested that PCGP develop a post-construction stormwater management plan by providing engineering designs and their technical support for permanent controls for cut and fill slopes. However, PCGP has not provided DEQ this information. In fact, PCGP notes the following in Resource Report 6 for Geologic Resources for BMPs on slopes steeper than 30%: *Steep side slope Pipeline construction segments will be identified during the final design phase of the Pipeline project. Fill slope construction details and specifications will be designed for the identified steep side slope Pipeline segments.* As indicated in DEQ's comments, the purpose of DEQ's request for engineered designs for these controls is to evaluate PCGP's efforts to prevent sediment discharge in stormwater and to prevent debris flows from landslides discharging into streams. Although PCGP refers DEQ to its Erosion Control and Revegetation Plan for this information, the ECRP does not provide this level of detail as noted elsewhere in DEQ's review. In the Erosion Control Revegetation Plan, PCGP provides DEQ with Section 11 on Seep and Rugged Terrain. This section provides no information regarding the discharge points for stormwater relative to unstable slope features. In this section, PCGP provides no information on how it will store construction spoils (e.g., root wads, soil, rock, slash) and logs to avoid adding additional weight to the top of unstable slopes (e.g., headwalls, rapidly moving landslide areas, mapped landslides). The following is what PCGP provides DEQ in its ECRP: *A significant portion of the Pipeline crosses rugged topography as it traverses the Coast and Cascade Mountain Ranges and foothills. Where the Pipeline passes through the dissected Coast Range and foothills between the Coos River and Myrtle Creek (MPs 9.00 to 81.00) most of the ridgelines run in the opposite direction of the proposed alignment. The orientation of the ridges requires the Pipeline, in numerous areas, to descend and ascend steep ridge slopes to cross stream drainages so that the alignment can proceed in a southeasterly direction toward Myrtle Creek and ultimately the terminus of the pipeline near Malin, Oregon. This similar condition also occurs between MPs 81.00 and 121.00 where the Pipeline traverses the Cascade Range and foothills. During routing, PCGP optimized the alignment along ridgelines, where feasible, to minimize crossing steep slopes and potential geologic hazards, to minimize waterbody crossings, and to minimize the amount of cuts and fill slopes that would be required which reduces the erosion hazard. Areas of steep side slopes (greater than 50% grade) were also avoided as much as practical during routing to minimize the complications associated with construction in these areas as well as potential long-term slope instability hazards.*

			The Geohazards and Mineral Resources Report (see Resource Report 6) provides a geotechnical hazards review that was conducted during routing and describes the avoidance mitigation measures that were implemented (i.e., minor reroutes) to avoid potential high risk geological hazards areas. Resource Report 7 of PCGP's FERC Certificate application also identifies the miles of soils crossed by the Pipeline which are associated with steep slopes and high erosion hazards. PCGP has noted areas where the proposed route traverses steep, narrow ridges and where it will be infeasible to return these ridges to their original preconstruction contours during final grading. Drawing 3430.34-X-0018 in Attachment C provides a typical construction right-of-way configuration in these sharp ridgeline areas. This drawing shows the construction techniques that will be utilized to ensure safe and feasible construction; minimize overall construction disturbance; and ensure the long-term safety, stability, and integrity of the pipeline. Avoidance of these areas is not feasible because stable alternate pipeline routes were not present along the alignment, except for other similar ridgeline features that would have the same conditions. *During construction across rugged topography, PCGP will utilize the same construction procedures outlined in this ECRP to minimize construction, geologic, and erosion hazards as well as to ensure the integrity of the pipeline. In summary these procedures include:* *• routing the pipeline to ensure safety and integrity of the pipeline;* *• identifying adequate work areas to safely construct the pipeline;* *• utilizing appropriate construction techniques to minimize disturbance and to provide a safe working plane during construction (i.e., two-tone construction; see Drawing 3430.34-X-0019 in Attachment C);* *• Spoil storage during trench operations on steep slopes (greater than the angle of repose) will be completed using appropriate BMPs to minimize loss of material outside the construction right-of-way and TEWAs. Examples of BMPs that may be used include the use of temporary cribbing to store material on the slope or temporarily end-hauling the material to a stable upslope area and then hauling and replacing the material during backfilling;* *• optimizing construction during the dry season, as much as practicable;* *• utilizing temporary erosion control measures during construction (i.e., slope breakers/waterbars);* *• installing trench breakers in the pipeline trench to minimize groundwater flow down the trench which can cause in-trench erosion;* *• backfilling the trench according to PCGP's construction specifications;*

			• restoring the right-of-way promptly to approximate original contours or to stable contours after pipe installation and backfilling; *• installing properly designed and spaced permanent waterbars;* *• revegetating the slope with appropriate and quickly germinating seed mixtures;* *• providing effective ground cover from redistributing slash materials, mulching, or installing erosion control fabric on slopes, as necessary; and* *• monitoring and maintaining right-of-way as necessary to ensure stability.* From the information PCGP provides above, the following - for example - is missing: • The design details for BMPs used to stabilize spoil storage on steep slopes to address the geotechnical concerns associated with adding additional weight to the head of unstable slopes. • The use of reinforced fill slopes on steep unstable slopes where PCGP notes that "the proposed route traverses steep, narrow ridges" as recommended in technical manuals for linear infrastructure projects. • The location of construction and post-construction stormwater discharge points relative to unstable landscape features/steep slopes/mapped landslides/Potential Rapidly Moving Landslide Hazards. • The location the discharge points for the hydrostatic test water, trench dewatering, and vehicle/equipment wash water relative to unstable landscape features/steep slopes/mapped landslides/Potential Rapidly Moving Landslide Hazards. • The stormwater management system for the construction right-of-way, for Temporary Extra Work Areas, and for other areas cleared of vegetation relative to unstable landscape features/steep slopes/mapped landslides/Potential Rapidly Moving Landslide Hazards. DEQ requests this additional information to determine if the location of construction and post-construction stormwater discharge, other discharge (i.e., hydrostatic, trench dewatering, and equipment wash water), and construction spoil/log storage have the potential to cause a landslide that flow into streams. DEQ also needs information from a geo-engineer's field investigations to identify suitable locations for discharging stormwater to minimize their potential to cause landslides. The limited filed investigations performed by PCGP and highlighted in DEQ's review below do not provide the information necessary to site the discharge of construction stormwater, post-construction stormwater, hydrostatic test water, trench water, and equipment washwater. PCGPs limited investigation of landslide risks focus only on deep-seated landslide risks for only mapped landslides. PCGPs *Potential Deep-Seated Landslide Evaluation Forms* did not include evaluations of risks associated with discharging stormwater to areas identified as rapidly moving landslides hazards and other unstable landscape features such as headwalls. As noted in the excerpt below, these filed investigation forms and their conclusions focused primarily on the potential risk to the pipeline. PCGP did not

evaluate the risks to water quality, for example, from rapidly moving landslides or deep-seated landslides from pipeline construction and operation.

Below is an excerpt from *Potential Deep-Seated Landslide Evaluation Form* for Landslide 34. Landslide 34 is an identified landslide from a published map. PCGP notes this landslide in Figure 24 of 47 in PCGP's Geologic Hazard Maps along Milepost 108.86 - 109.44 of the proposed gas pipeline.

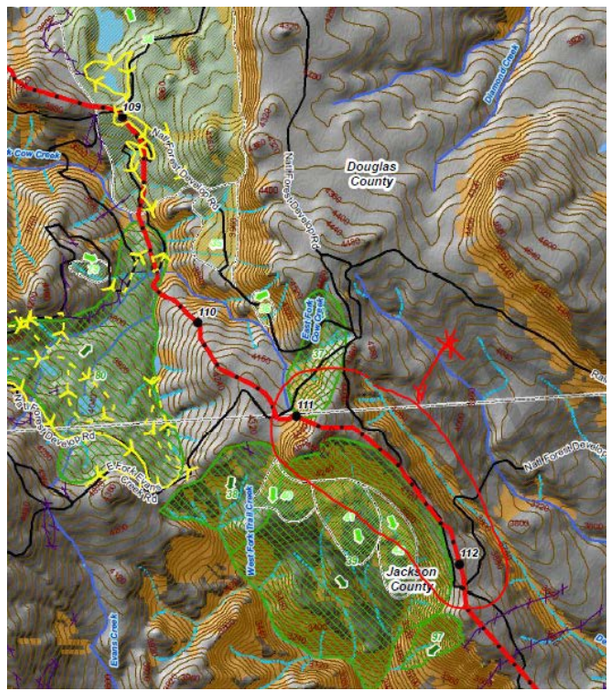
CONCLUSIONS BASED ON SURFACE OBSERVATIONS

Factors Contributing to Cause of Landslide (natural, anthropogenic):
Volcanic and tectonic activity.

Potential Risk to Pipeline: **Low**
We developed a geologic cross section through LS-34. Based on the location of the inferred slide plane and existing slope geometry, it is our interpretation that the failure plane for this very large landslide feature occurs approximately 100 feet below the ground surface at the location of the proposed pipeline. Excavation for pipeline construction will be typically less than 10 feet in depth and is not anticipated to encounter the inferred basal slide plane of LS-34. The volume of earthwork and depth of excavation required for the pipeline construction is small relative to the size of the landslide and likely depth of the slide plane. For this reason, it is our opinion that there is a low risk of construction adversely impacting the stability of this dormant-mature landslide.

The observations noted in the excerpt above do not address the additional stormwater discharge to this unstable landscape feature particularly above East Fork Cow Creek.

Moreover, PCGP's field investigation in this area as well as many other areas was limited in scope. For example, PCGP did not investigate the steep slopes surrounding the propose pipeline locations between Mile Posts 109 and 109.8 and between Mile Posts 111 and 112.2 (see the Geologic Hazard Map excerpt below). At these two sections of the proposed gas pipeline, PCGP has not indicated how PCGP will manage stormwater from the pipeline's construction and post-construction operations nor stabilize the fill slopes or the cut slopes. PCGP's proposed pipeline at Mile Post 109.4 and 109.5 is altering the toe of slope in areas identified as mapped Landslide 34 and as an Area of Rapidly Moving Landslide Hazard. However, PCGP does not provide DEQ with information regarding its design for loading the toe of this cut slope in these areas to prevent destabilizing it and causing a debris torrent to discharge into the East Fork Cow Creek.

			As documented in DEQ's review above, water plays a key role in the cause and mitigation of landslides. Referring to the map excerpt below, PCGP has not provided DEQ with information on how it will manage stormwater to avoid causing a debris flow below the pipeline in the rapidly moving landslide hazards on each side of the pipeline from Mile Post 111 to Mile Post 112.2. These Areas of RML also coincide with Landslides 37, 38, 42, and 80. Landslide 37, 38, 42, and 80. These are identified landslides from aerial photos. However, PCGP did not include them as part of its field evaluations of landslide risks. PCGP has not provided DEQ with engineering designs to stabilize the proposed pipeline's fill slopes for Landslides 37 and 42 as well as the cut and fill slopes for Landslide 38 and 80. There are numerous other areas of landslide risks where PCGP has provided no field evaluations or engineering analysis for protecting water quality from debris flows potentially precipitated by: • Loading additional stormwater at the top of unstable slopes when constructing and operating the gas pipeline. • Cutting into an unstable slope when constructing and operating the gas pipeline.  Geologic Hazard Map (Figure 24 of 47) from Resource Report 6 featuring several identified landslides including 34, 37, and 42 discussed

			In addition to PCGP's typical construction methods noted in the Erosion Control and Revegetation Plan excerpt above, PCGP identifies steep side slopes requiring restoration. PCGP provides the fill slope specifications below to ensure slope stability: *Fill slopes will be constructed in order to return the site to the approximate pre-construction topography. Fill slopes which exceed a gradient of 3H:1V (Horizontal:Vertical), will be constructed in accordance with the following specifications under the supervision of PCGP's qualified representative:* *Materials* *1. Fill materials used for constructing slopes exceeding 3H:1V will be considered structural fill.* *2. Materials used as structural fill should be free of roots, organic matter, and other deleterious materials.* *3. Fill materials will be at a moisture content suitable for compaction.* *4. If on-site soils are unsuitable for use as structural fill, imported structural fill will consist of pit or quarry run rock, crushed rock, crushed gravel and sand, or sand that is fairly well graded between coarse and fine, contains no clay balls, roots, organic matter or other deleterious materials, and has less than 5 percent passing the U.S. No. 200 Sieve.* *Slope Preparation* *1. Slopes to receive fills will be prepared by stripping the existing organic material and topsoil.* *2. Construct steps or benches on existing slopes to receive fills that exceed 3H:1V. The bench height to width ratio will be adjusted to match the existing slope gradient.* *Fill Placement and Compaction* *1. Fill soils will be compacted at a moisture content that is suitable for compaction. The maximum allowable moisture content varies with the soil gradation, and will be evaluated during construction. Silt and clay and other fine granular soils may be difficult or impossible to compact during persistent wet conditions.* *2. Fill material will be placed in uniform, horizontal lifts. Minimum lift thickness will vary based on material compacted and the type of compaction equipment used.* *3. Compact each lift by operating, hauling, and spreading equipment uniformly over the full*

			width of each layer until there is no visible deflection under the load of the hauling and spreading equipment. If each lift of fill cannot be accessed by the hauling and spreading equipment to achieve compaction, then other suitable compaction equipment will be used to obtain the required compaction. Alternative compaction equipment and methods may include tamping with a trackhoe bucket, vibratory plate compactors (hoe-pack) or rollers. Based on a review of available technical manuals for slope stabilization, PCGP's generic specifications presented above do not implement the recommendations in several technical guides on stabilizing slopes. PCGP does not provide need site-specific engineering analysis or technical support for the proposed fill slope specifications referenced above to demonstrate these practices are sufficient for each site where PCGP needs to stabilize fill slopes. As noted in PCGP's Resource Report 6 and 7, the alignment for the gas pipeline will traverse the Tyee Core Area an area known for its landslide activity as well as areas with steep slopes and highly erosive soils. The following information is missing from PCGP's specifications for the placement of the alignment on or above steep unstable slopes that are common along a substantial portion of the proposed alignment: • Information (i.e., engineering designs and their technical support) for the application of reinforced fill (embankments), retaining walls, buttresses or other techniques designed to stabilize unstable slopes along the gas pipeline alignment such as Areas of Rapidly Moving Landslide Hazards, Headwalls, and Mapped Landslides. • Information (i.e., engineering designs and technical support) on how PCGP will manage stormwater and groundwater on cut slopes into unstable slopes along the gas pipeline such as Areas of Rapidly Moving Landslide Hazards, Headwalls, and Mapped Landslides. • Information (i.e., engineering designs and technical support) on how PCGP will manage runoff onto fill slopes and manage stormwater on terraces constructed on unstable slopes such as Areas of Rapidly Moving Landslide Hazards, Headwalls, and Mapped Landslides.[56, 57] Moreover, for steep slopes with erosive soils and/or with landslide features, PCGP's proposed revegetation BMPs highlighted in the Erosion Control Revegetation Plan may not be sufficient practices. DEQ reviewed the information presented in PCGP's ECRP and found it lacking in engineering designs and their technical support. PCGP's proposed update to address DEQ's Comment 35 must contain engineering designs and their technical support. These engineering designs and technical support must address site-specific

[56] Hall, David E., Michael T. Long, and Michael D. Remboldt (Editors). 1994. *Slope Stability Reference Guide for National Forests in the United States Volume III*. USDA Forest Service EM-7170-13. Washington, DC
[57] Chatwin, S.C., D.E. Howes, J.W. Schwab, and D.N. Swanston. 1994. *A Guide for Management of Landslide-Prone Terrain in the Pacific Northwest* (2nd Edition). Research Branch of the Ministry of Forests. British Columbia.

constraints encountered as PCGP prepares the erosion and sediment control plan for a NPDES 1200-C Permit and the post-construction stormwater control plan for this proposed gas pipeline. In the development of the Certification Decision, DEQ will not accept qualitative descriptions of BMPs in an updated table as an adequate response to Comment 35.

DEQ photographed an Electrical Power Line right-of-way featured in the October 2, 2018 photo below that is close to the PCGP's proposed pipeline alignment. Within the right-of-way for this power line, two small slides developed after the operators established herbaceous and woody vegetation in the right-of-way. PCGP's BMPs for this area are simply to revegetate the slope with herbaceous vegetation following specifications designed for particular land ownership (i.e., Forest Service, BLM, etc.). This power line right-of-way is just east of the proposed gas pipeline alignment in the Tyee Core Area. The power line right-of-way featured in the photo below is on a slope in an area identified as a mapped landslide in the Statewide Landslide Information Database for Oregon. The power line right-of-way is also located in an area identified as an Area of Rapidly Moving Landslide Hazard in PCGP's Geologic Hazard Map Figure 2 of 27 (See Aerial Photo and Map Figure below). The area where this power line is exhibiting small slope failures and where the proposed gas pipeline alignment is proposed has the following soil types with the following erosion hazard rating:

Dominant soil type(s)

Soil Type	Erosion Hazard Rating	Hydric Rating	Percent Area
Salander silt loam, 50 to 75 percent slopes	Severe	No	32.07 %
Templeton silt loam, 30 to 50 percent slopes	Severe	No	17.97 %
Millicoma-Templeton complex, 50 to 75 percent slopes	Severe	No	9.94 %
Templeton silt loam, 50 to 70 percent slopes	Severe	No	7.96 %
Geisel silt loam, 12 to 30 percent slopes	Severe	No	7.27 %
Templeton-Millicoma complex, 12 to 50 percent slopes	Severe	No	7.00 %
Templeton silt loam, 30 to 50 percent slopes	Severe	No	6.73 %
Nestucca-Willanch complex	Slight	Yes	4.47 %
Geisel silt loam, 12 to 30 percent slopes	Severe	No	2.73 %
Templeton silt loam, 7 to 30 percent slopes	Severe	No	1.22 %

Results from Oregon Explorer's Oregon Rapid Wetland Assessment Protocol and Stream Function Assessment Method Map Viewer for soils in area containing the Electrical Power Line Right-of-Way and a section of PCGP's proposed gas pipeline west of the power line ROW.



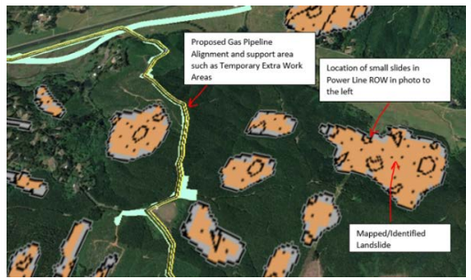




Photo to the left taken by DEQ on October 2, 2018 showing two small slides on a revegetated slope of an Electrical Power Line Right-of-Way. Aerial photo in the middle shows this power line right-of-way featured in the photo to the left relative to identified landslides. The topographical map to the right is PCGP's Geologic Hazard Map of this same area delineating the Areas of Rapidly Moving Landslide Hazards in light brown. This topographical map shows that the Electrical right of way moves down an unstable landscape feature referred to as a convergent headwall discussed in DEQ's review of PCGP's response to Comment 15. This unstable landscape feature also contains soils with a severe erosion potential as noted above.

PCGP is proposing to construct and operate a right-of-way for a gas pipeline at many locations with similar site constraints without providing DEQ with engineering designs developed to address site constraints presenting real risks to water quality over time. DEQ's request for the detailed information noted above is essential to demonstrate that PCGP will construct and operate this gas pipeline preventing sediment discharge in stormwater and preventing landslides discharging debris flows into streams.

Comment 36 of AIR-1 (Post-construction Stormwater Plan for Access Roads/Modeling WQ Impact)

For DEQ's review of PCGP's response to Comment 36, please see DEQ's review of PCGP's response to Comments 26 and 27 provided above. This review for Comment 26 and 27 is also applicable to PCGP's response to Comment 36. Additionally, DEQ does not believe that PCGP's additions to Table A.2-6 in Appendix A.2 of Resource Report 2 will provide DEQ with the level of detail regarding maintenance prescriptions as well as road improvements needed to ensure the use of existing access roads will protect water quality.

First, the road segments presented in the table PCGP references in its response (i.e., Table A.2-6) include only those segments within 100 feet of a water body. DEQ is requesting that PCGP's inventory evaluate all existing access roads hydrologically connected to water bodies. The use of an arbitrary distance of 100 feet

			does not provide DEQ reasonable assurance that PCGP's proposed measures will protect water quality. In AIR-1, DEQ requested the use of a model such as the Geomorphic Road Analysis and Inventory Package (GRAIP) to inventory roads for surface erosion, gully risk, and landslide risk. Using an analytical tool such as GRAIP is a more objective approach rooted in knowledge gained from evaluating the impact of roads on water quality. GRAIP can also identify road segments hydrologically connected to water bodies. To develop its Certification Decision, DEQ will not accept PCGP's focus on only roads within 100 feet of water bodies and a listing of qualitative BMPs in the proposed updated table without the following information: • Objective and quantitative support using a model (e.g., GRAIP or comparable model approved by DEQ) to identify the need for BMPs on road segments hydrologically connected to water bodies. • Engineering designs and their technical support addressing the concerns identified employing this model or analytical tool. • A plan requested in DEQ's *Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines* identifying where these BMPs are located on the landscape, their proposed design, and technical support accompanying this design. Finally, PCGP's response to Comment 36 does indicate that PCGP will propose and, once approved, use an analytical model such as X-DRAIN to evaluate siting alternatives for roads and their potential impact to water quality. This is particularly important for the construction of access roads of significant length in locations with steep slopes, unstable slopes, and erosive soils such as Temporary Access Road 101.70 between Mile Posts 101 and 102 discussed in more detail in DEQ's review of PCGP's response to Comment 26 and 27.
37	Please provide an evaluation of compliance with water quality standards if Jordan Cove Energy Project and Pacific Connector Gas Pipeline will use dredged material in the construction of facilities in uplands and drainage from this dredge material will discharge to waters of the state. This request is to expand upon the Portland Sediment Evaluation	The management of water quality during the construction of the LNG Terminal, APCO 2, and Kentuck, where dredge material characterized in the referenced 2016 PSET letters, will be addressed in respective 1200-C permits. As noted above, JCEP and PCGP are currently preparing respective 1200-C application materials and anticipate submitting	DEQ anticipates PCGP's response in Q4 2018.

	Team's assessment (PSET Letters, January 19, 2016) that considered these constructed upland facilities to be outside federal Clean Water Act jurisdiction for the dredged material suitability determination. However, upland constructed facilities using dredged material are not outside the effects considered in a 401 Water Quality Certification of a FERC application for the construction of a gas pipeline.	applications to DEQ in Q4 2018.	
38	Please provide a post-construction stormwater management plans addressing DEQ's *Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines* for North Point Workforce Housing Project noted in the Part 1, Section 404 Permit Application, Attachment F, Portland Sediment Evaluation Team Letters, Section 404 Permit Application. (If this site is not going to be used for the North Point Workforce Housing, please provide the post-construction stormwater plans for the proposed uses.) In addition, please provide the results of the Phase II	The location of workforce housing has changed from the North Spit (a.k.a. APCO Sites 1 and 2) to the South Dunes site to minimize overall project impacts. The nature of existing soil and groundwater conditions for South Dunes has been characterized in a report titled Data Gaps Investigation Report which was provided to ODEQ in August 2018. JCEP is currently preparing a 1200-Z permit application for the LNG terminal which will include South Dunes and anticipates submitting to ODEQ in Q4 2018.	DEQ anticipates PCGP's response in Q4 2018.

	environmental assessments evaluating the potential for contaminated soils summarized in the "FEIS, Section 4.3.1.3 (Soil Limitations) as noted in these PSET Letters.		
39, 40, 41, 43	Comment 39: The 401 Water Quality Submittal package provides insufficient information concerning the dredging operations for the Marine Slip, Access Channel, and Material Offloading Facility. DEQ used a copy of Resource Report 1 (Section 1.5.5.2) for the development of an environmental Impact Statement to obtain general information on the dredging operation. To direct the reader to additional information, this resource report references to the Dredge Material Management Plan and Resource Report 7 (Section 7.3.2.5). These two additional references provide few details regarding the water pollution control practices in the Marine Slip and Access Channel dredging operations. In compliance with OAR 340-041-0007(1) and -0036, please provide for DEQ review and approval a detailed pollution control plan for constructing the Access Channel and Marine	Additional details regarding the construction of the Marine Slip, Access Channel and Material Offloading Facility is provided in the following areas: • Construction Methodology: Part 1, Attachment A.1 of the 404-10 Application (included as Appendix M of the 401 Water Quality Package, issued to ODEQ on 2/6/18). • Dredge Disposal Location at Roseburg Forest Products: Enclosures 19 - 22 of Part 1, Appendix N-5 of the 401 Water Quality Package issued to ODEQ on 2/6/18. • Section 2.1.1.2, Dredging and Shore Protection at 2-21 - 2-26 of the Applicant Prepared Draft Biological Assessment (APDBA), Submitted 9/14/18. • Sections 3.5.1.3 and 3.5.4.3, Turbidity Effects from Dredging in Coos	**Summary Statement: DEQ anticipates JCEP will submit additional dredging information, including a pollution control plan, in Q1 2019. Please incorporate responses to the questions in the following section in JCEP's pollution control plan.** As JCEP is developing the advanced engineering details regarding dredging execution for Q1 2019, DEQ is providing JCEP with several examples of the questions that arose during DEQ's review of its Section 401 Water Quality submittal and the references JCEP provided in its response to Comments 39, 40, 41, and 43. The information provided in JCEP's response does not change DEQ's request in AIR-1 for a detailed pollution control plan for constructing the Access Channel and Marine Slip. Additionally, in JCEP's response to Comment 43, JCEP must provide information concerning the characterization of dredged material that JCEP proposes to use as fill in various locations. In developing additional information for Q1 2019. DEQ requests JCEP provide this information to ensure that dredged material used as fill does not contaminate the identified disposal sites and lead to pollutant discharge to waters of the state via decant water. In reviewing the recently provided references, DEQ is unable to locate Enclosures 19-22 of Part 1 (Appendix N-5 of the 401 Water Quality Package) that JCEP references in its response to Comment 39, 40, 41, and 43. The references JCEP provided in its response do not provide the detailed pollution control plan requested in AIR-1. To ensure compliance with Oregon's turbidity standard (OAR 340-041-0036), JCEP must demonstrate in the pollution control plan requested in Comment 39 that "all practicable turbidity controls have been applied" during JCEP's dredging activities. JCEP's information in the references noted in its response provide a conceptual approach to minimize turbidity and other pollutant discharges. JCEP has not fully developed the details of all its proposed controls and this creates uncertainty regarding their efficacy. For example, PCGP's proposed pollution control plan for dredging must clearly identify: • The type of pollution controls JCEP will use including its design and specifications. • The specific applications for these controls. • The specific location where JCEP will employ these controls relative to sensitive sites as well as other landscape features (e.g., drainage pattern, vegetation, etc.). • The maintenance schedule for each control. • A monitoring plan for evaluating the efficacy of all proposed controls and compliance with the turbidity standard.

	Slip that provides at least the following information: • A detailed description of the sequencing of all construction dredging activities associated with the in-water Marine Slip construction, Access Channel construction, and Material Offloading Facility construction. <u>Comment 40</u>: • A site map of these construction actions and location of all structural controls to protect water quality. The site maps must include the following information: o A delineation of the areas in the Marine Slip that Jordan Cove will dry excavate and dredge. o Please include the pollution controls for the dry excavation activities in response to the request above in an Erosion and Sediment Control Plan for a NPDES 1200-C Permit Application. o The location of the natural earthen berm	Bay on North American Green Sturgeon at 3-316 – 3-320) of the APDBA, Submitted 9/14/18. • Section 3.5.4.3, Turbidity Effects from Dredging in Coos Bay on Oregon Coast Coho Salmon at 3-522 – 3-525 of the APDBA, Submitted 9/14/18. Further advanced engineering details regarding dredging execution will be provided to ODEQ in Q1 2019.	For example, the Construction Methodology in Part 1 (Attachment A.1) of JCEP's submittal notes the following: *To the extent feasible, dredging of the access channel and slip will be performed with a CS dredge to minimize turbidity.* *The hydraulic dredge transport pipeline for hydraulic transportation of excavated materials (including the decant water return line) will follow the shoreline of the site of the Roseburg Forest Products chip loading facility and will not result in additional land disturbance.* *At all points along the pipeline route where the slurry pipeline could rupture and the contents could potentially enter the waters of Coos Bay, secondary containment will be provided around the slurry pipeline.* *Eelgrass and estuarine habitat disturbances resulting from the pipeline will be minimized by spanning these eelgrass areas or avoidance through the use of temporary structures or floats.* *Material removed by the hydraulic CS dredges will be sent via a submerged and/or floating pipeline to approved disposal sites, where dewatering would occur.* *Dredged or other excavated material will be placed on areas having stable slopes, and will be prevented from eroding back into waterways and estuarine wetlands.* This information raises the following questions for DEQ that must be addressed in a detailed pollution control plan as DEQ develops its Certification Decision: • When a Construction Suction (CS) dredge is not feasible, what other dredge will JCEP use as an alternative? • What control(s) will JCEP use to minimize pollutant discharge when using various dredging equipment? What are the designs and specifications for these controls? How and where will JCEP employ these controls? How will JCEP monitor their effectiveness for complying with the turbidity standard? • What controls – including designs and specifications – will JCEP use to prevent a spill from the hydraulic dredge transport pipeline? Where specifically will JCEP locate these controls on the landscape? What is their containment capacity? Is this capacity sufficient for anticipated spills? Does JCEP have contingency controls to protect sensitive resource should the proposed containment fail?

	separating the upland area of the Marine Slip that Jordan Cove will dry excavate from the remaining portion of the Marine Slip adjacent to the bay that Jordan Cove will dredge. o The location of the in-water dredging for the Access Channel and Material Offloading Facility. o The location of the slurry/hydraulic transport pipeline(s) for the transportation of the dredged material. o The location of all containment systems and/or spill response materials. <u>Comment 41</u>: • A construction dredging plan providing the following: o Dredging schedule for the Marine Slip, Access Channel, and Material Offloading Facility. o Type (e.g., cutter-suction dredging) and number of dredging plants that Jordan Cove		• What controls does JCEP propose as a contingency should the control for spanning the eelgrass and estuarine habitat fail? • If JCEP uses temporary structures or floats to minimize eelgrass and estuarine habitat disturbances, what are these structures/floats, what are their designs and specifications? Does JCEP have contingency controls should the temporary structures/floats fail? • What is the secondary containment including its designs and specifications for the submerged and/or floating pipeline for material removed by the hydraulic CS dredges? • Where is the specific location of the containment system for the placement of dredge material including information on key landscape features such as drainage patterns and the location of freshwater and estuarine wetlands, freshwater streams, salt-tolerant and non-salt tolerant vegetation? Where is the drainage system and the discharge points for decant water? Is the decant water saline or non-saline? What are the receptors for this decant water? For example, in JCEP's response, JCEP refers DEQ to Section 2.1.1.2 (Dredging and Shore Protection) from the Applicant Prepared Draft Biological Assessment for additional information. The draft Biological Assessment notes the following: *Dredging and Shore Protection* *For the capital dredging, about 5.7 million cubic yards (mcy) of material would be removed to create the slip basin and access channel. Of this, about 1.4 mcy would be dry excavated and about 4.3 mcy would be wet dredged. It is proposed that excavated and dredged material be distributed between Ingram Yard, the Roseburg site, the South Dunes site, and the Kentuck Project site.* *During the "fresh water" construction phase of the slip about 2.2 mcy of material would be dredged in the pocket behind a temporary construction berm. During the "salt water" construction phase of the slip, about 0.7 mcy (slip and berm) of material would be dredged during removal of the temporary construction berm and finish dredging of the marine slip, of which about 0.3 mcy may be used for the Kentuck Project. It is also possible that the 0.3 mcy required to facilitate the Kentuck Project could be sourced from the salt water dredge taken from the access channel between the FNC and the proposed LNG Terminal marine slip. A total of about 1.4 mcy of material would be dredged from the bay during construction of the access channel.*

	will use during the dredging of the Marine Slip, Access Channel, and the Material Offloading Facility. o A description of water pollution controls (operational controls, structural such as floating turbidity curtain etc.) that Jordan Cove will use in dredging and transporting dredged material. o Detailed spill response procedures including all emergency shut-off procedures and procedures for a spill associated with the hydraulic transport pipeline. o A description of all operational and structural water pollution controls for breaching and removing the natural earthen berm noted in Section 1.5.5.4 of the Jordan Cove's Resource Report 1. o A dredging monitoring plan for DEQ review and approval to evaluate the		*The northern slip face would be armored after the slip is dredged but before the earthen barrier berm is removed. The barrier berm would remain unarmored, because it would be removed during the later stages of slip construction.* *The estimated excavated and dredged material volumes and their proposed placement location are summarized in table 2.1.1-1 and further discussed in subsequent sections below.* This information raises the following questions for DEQ that must be addressed in a detailed pollution control plan as DEQ develops its Certification Decision: • Where specifically are the disposal sites for the dredged material deposited in the following locations: o Ingram Yard Site. o Roseburg Site. o South Dunes Site. o Kentuck Project Site. o And all other sites. • How will JCEP manage the fresh and/or saline decant water if discharged from these sites to the surrounding landscape? • How will the management of the decant water comply with Oregon's biocriteria (OAR 340-041-0011) if this decant water is discharged to waters of the state such as fresh or estuarine wetlands? • What specific controls will JCEP use to remove the temporary construction berm to ensure compliance with the Oregon's turbidity standard (OAR 340-041-0036) and how will JCEP monitor compliance with this standard? • What controls will JCEP use to prevent no more than a ten percent increase in turbidity when the temporary construction berm is removed and JCEP dredges the Access Channel? • Where specifically will JCEP locate the structural controls during the dredging of the Access Channel? In the development of AIR-1, DEQ reviewed the information related to the dredging of the Marine Slip, Access Channel, and Material Offloading Facility in the Dredge Material Management Plan. This information also does not provide DEQ with the level of detail to evaluate the efficacy of JCEPs proposed practices to ensure compliance with the turbidity standard. For example, this plan identifies the Ingram Yard as a disposal site for the dredge material as follows:

	effectiveness of all proposed controls. Comment 43: In compliance with OAR 340-041-0007(1) and -0036, please provide for DEQ review and approval a detailed water pollution control plan presenting all practicable operational and structural control techniques that Jordan Cove Energy Project will employ when constructing the Material Offloading Facility east of the opening for the slip at the Liquefied Natural Gas Terminal. Please include in this plan a characterization of the fill material Jordan Cove will use to construct this facility that evaluates this fill material for contamination.		*Section 4.4.4 Ingram Yard* *Disposal Methods* *Excavated and dredged material from the slip and access channel will be transported to the site in dump trucks. Material will be placed and compacted to meet project specifications. Additionally, hydraulically dredged material may be transported via pipeline and discharged within temporary containment berms, allowing material to settle and dewater. The berms will be constructed using existing on-site material initially, followed by incoming dredge material. The disposal methodology will be similar to that listed in Section 4.4.1 above. Decant water will be returned to the dredge as needed pending final design.* *Availability* *The Ingram Yard disposal site is within the JCEP project area and, therefore, availability of the site for dredged material disposal can be confirmed. JCEP also has access to the Roseburg Site and will manage the placement of material at this site.* The sampling of information in this plan raises the following questions for DEQ that JCEP must address in a detailed pollution control plan: • Will JCEP include the access roads for the dump trucks hauling dredged material and any needed erosion and sediment controls in the plan required for a NPDES 1200-C Permit? • Will JCEP place dredged material from a pipeline conveying dredged material to Ingram Yard and, if so, will JCEP provide secondary containment for this pipeline conveying dredged material? • Where will JCEP locate the containment berms for decanting water from dredged material? How will JCEP manage decant water from dredging to protect non-salt or salt tolerant vegetation in fresh and estuarine wetlands and water ways to comply with the Oregon's biocriteria (OAR 340-041-0011)? The above questions represent a sample of the detailed information DEQ is seeking from JCEP as it develops a detailed pollution control plan for DEQ's review and approval during the development of a Certification Decision.

42	• A maintenance dredging plan providing the following: o A site map containing the following: ▪ The location of all areas Jordan Cove will dredge. ▪ The location of the slurry/hydraulic transport pipeline(s) for the transportation of the dredged material. ▪ The location of all containment systems and/or spill response materials. o Dredging schedule. o Type (e.g., cutter-suction dredging) and number of dredging plants that Jordan Cove will use during the maintenance dredging. o A description of water pollution controls (operational controls, structural controls such as floating turbidity curtain etc.) that Jordan Cove will use and the location of all structural controls to minimize the migration	The JCEP Project detailed in the 404-10 application encompasses the dredging required for the Project (Appendix M of the 401 Water Quality Package, submitted to ODEQ on 2/6/18). Any future maintenance dredging activities will be requested under a separate 404-10/401 permit application and will be subject to a separate certification from ODEQ for compliance with section 401 of the CWA, if and when, such activities are required.	Maintenance dredging for the slip and access channel is estimated at 115,000 cy every three years for the first 10 years of operation and about 160,000 cy every five years thereafter. DEQ expects JCEP to apply for and receive authorization from the Army Corps of Engineers and section 401 water quality certification from DEQ prior to undertaking maintenance dredging activities.

	of turbid water from maintenance dredging activities, o Detailed spill response procedures including all emergency shut-off procedures and procedures for a spill associated with the hydraulic transport line. o A dredging monitoring plan for DEQ review and approval to evaluate the effectiveness of all proposed controls		
44	DEQ will perform this review upon the receipt of information requested above. In addition to these requests for information, please provide to DEQ an application for an Individual Industrial Water Pollution Control Facility Permit for the proposed discharges of the hydrostatic testing wastewater. Please provide the location of each point of discharge. If Jordan Cove Energy Project or Pacific Connector Gas Pipeline expects to discharge washwater to the ground from vehicle and equipment washing, please provide an application for a Water Pollution Control Facility Individual Permit for these	PCGP is currently preparing a Water Pollution Control Facility permit application for hydrostatic test water discharges during the construction of the pipeline and will submit to ODEQ in Q4 2018. PCGP is also preparing a 1200-C permit application for the construction of the pipeline. PCGP anticipates submitting the application to ODEQ in Q4 2018. The Erosion Control and Revegetation Plan (ECRP) provides details for equipment cleaning in Section 12.4 (pdf page 499 in Attachment A to Appendix B to Part 2 of the JPA) and a BMP typical for	**Summary Statement: PCGP cannot use an NPDES 1200-C General Permit and any plan associated with this stormwater permit to cover the discharge of wash water during pipeline construction. In the section below, DEQ includes a strategy for PCGP to manage wastewater discharges during pipeline construction in compliance with state rules. State rules for developing a Certification Decision require that PCGP's submittal demonstrate compliance with the effluent limitations of the NPDES 1200-C Permit. In the section below, DEQ identifies three potential wastewater discharges from PCGP's proposed actions that will require wastewater permit(s).** NPDES 1200-C Permit does not allow discharge of wastewater to waters of the state or to land. The NPDES 1200-C General Permit contains the following condition from Schedule A.6: *6. Prohibited Discharges* *Discharges of the following are not authorized by this permit:* *a. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;* *b. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;* *c. Soaps or solvents used in vehicle and equipment washing.* *d. Concrete truck wash-out, hydro-demolition water, and saw-cutting slurry.*

	discharges. Please provide the location of each point of discharge.	these types of operations as depicted and described in Drawing 3430.34-X-0020 in Attachment C to the ECRP). Note #8 in the drawing states, "Water used for cleaning shall not be allowed to flow into any waterbody, wetland or irrigation canal/ditch."	To manage the following discharges in compliance with state rules and permit requirements, PCGP must seek coverage for these discharges under a separate application for a Water Pollution Control Facility Individual Permit: • Hydrostatic test water • Vehicle and Equipment wash water • Trench dewatering DEQ is currently researching the feasibility of covering these three discharges under one WPCF Individual Permit.
45	DEQ will perform this review upon the receipt of information requested elsewhere in this matrix. In addition to these requests for information, please provide a copy of the results from the first phase (i.e., desktop data review with maps) of the Shallow Groundwater Study (Revised August 24, 2017 by GeoEngineers) showing suspected locations of shallow groundwater along the pipeline right-of-way. Please expand the maps proposed in this study to include suspected locations of shallow groundwater along the proposed route for the 25 miles of Temporary or Permanent Access Roads. When complete, please provide the results from the implementation of the subsurface exploration plan proposed for phase two of this study with an analysis of how the construction and permanent right-of-way will impact	The purpose of this plan was to aid pipeline design to account for buoyancy in areas of shallow groundwater. Please see the ECRP for how trench dewatering in shallow groundwater areas will be filtered and released for infiltration to minimize offsite sedimentation.	**<u>Summary Statement</u>: DEQ provides the rationale for the information requested below. As discussed in DEQ's review of PCGP's response to Comment 44, PCGP will need to submit a WPCF Permit Application to cover the trench dewatering discharge.** As noted in DEQ's review matrix from AIR-1, the intent of DEQ's Comment 45 is to determine compliance with OAR 340-048-0042(2)(e) when reviewing PCGP's proposed activities. The goal of DEQ's review is to determine if PCGP's proposed actions have the potential to modify groundwater quality and how these potential modifications affect surface water quality. Given the presence of Temperature Total Maximum Daily Loads and the influence of the pipeline's construction on compliance with these TMDLs, DEQ has concerns regarding PCGP's approach to mitigate the capture of shallow groundwater in the trench for the pipeline. DEQ will need this information to determine compliance with OAR 340-048-0042(2) (e.g., Section 303 of the Clean Water Act). In its response to Comment 45, PCGP indicates that the purpose of the Shallow Groundwater Study was to aid in pipeline design to account for buoyancy in areas of shallow groundwater. PCGP submitted this study in its 401 Water Quality Certification package to support the certification of the pipeline's construction and operation. When studies are included in a submittal, DEQ expects these studies to encompass water quality concerns in addition to, for example, pipeline stability concerns noted in PCGP's response. Both are important, and PCGP must address both in its submittal package. PCGP's referral to the submittal's Erosion Control and Revegetation Plan does not provide DEQ with sufficient detail to evaluate PCGP's effort to mitigate the capture of shallow groundwater during pipeline construction. DEQ requires the following information from PCGP: • Please provide a copy of the results from the first phase of the Shallow Groundwater Study showing suspected locations of shallow groundwater along the pipeline right-of-way. • Indicate if these areas of suspected shallow groundwater are in areas where PCGP proposes Temporary and Permanent Access Roads and, if so, propose mitigation measures to manage shallow groundwater.

	shallow groundwater as well as the construction of any proposed new roads. Moreover, please propose practices for how Pacific Connector Gas Pipeline will avoid, minimize, and, if necessary, mitigate the impacts identified in the Shallow Groundwater Study noted above.		• Provide an analysis demonstrating that the evapotranspiration losses from PCGP's two proposed mitigation approaches will not be significant to affect surface water quality (i.e., temperature) and will not require a third mitigation option such as discharging to an underground injection control device. • Identify PCGP's criteria for using the proposed mitigation measure of filter fabric/hay bales and the mitigation measure using a filter bag. • Provide the specific location for where PCGP will site all trench-dewatering measures. • Provide performance standards for mitigation measures to avoid overflow, prevent runoff, etc. In further reviewing PCGP's submittal, DEQ also has concerns about compliance with Oregon Water Rights Law and Division 33 rules (OAR 690-033) to administer this statute. As discussed above in DEQ's review of PCGP's response to AIR-1, DEQ is concerned that PCGP's proposed trench dewatering approach may cause landslides on unstable slopes by its effect on soil pore pressure depending on its location of discharge. To develop a Certification Decision, DEQ needs the following information from PCGP: • Please provide the geo-engineering analysis indicating that the discharge from the trench dewatering measure will not cause a landslide/debris flow when these measures are located above or on unstable landscape features such as headwalls, Areas of Potential Rapidly Moving Landslide Hazard, mapped landslides, steep slopes (greater than 30%), and highly erosive soils. Additionally, PCGP must submit a Water Pollution Control Facility Individual Permit Application to DEQ to cover the discharge from trench dewatering as required by OAR 340-045-0015(1)(a). DEQ considers this groundwater seepage into the pipeline's trench wastewater once it contacts one or more of the following: • Sediment from trench construction and potential pollutants (heavy metals such as arsenic, nutrients). • Pollutants arising from construction operations (e.g., oil and grease, welding slag, chemical coatings, etc.).
46	Please provide signed Land Use Compatibility Statements from Coos, Douglas, Jackson, and Klamath Counties.	Signed LUCS from Coos, Douglas, Jackson, and Klamath Counties will be provided in Q4 of 2018.	DEQ is awaiting PCGP's response.

Other References

Benda, L.E., Veldhuisen, C., Miller, D.J., and Rodgers-Miller, L. 2000. *Slope instability and forest land managers: A primer and field guide*. Seattle, Wash., Earth Systems Institute, 74 p.
Elliot, William J. and Laurie M. Tysdal. 1999. Understanding and Reducing Erosion from Insloping Roads. Journal of Forestry. 97(8):30-34
Hearn, G.J. 2011. Slope Engineering for Mountain Roads. Geological Society Engineering Geology Special Publication No. 24

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Oregon
Kate Brown, Governor

Department of Environmental Quality
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OTRS 1-800-735-2900

March 11, 2019

Derik Vowels
Jordan Cove LNG, LLC
Consultant, Lead Environmental Advisor
111 SW 5th Ave.,
Suite 1100,
Portland OR 97204

Re: Additional Information Request – Waterbody Crossings
Jordan Cove Energy Project (FERC Project No. CP17-494)
Pacific Connector Gas Pipeline (FERC Project No. CP17-495)
U.S. Army Corps of Engineers (Project No. NWP-2017-41)

Dear Mr. Vowels:

The Oregon Department of Environmental Quality is currently reviewing an application from Jordan Cove LNG, LLC for Clean Water Act Section 401 water quality certification for a Section 404 permit from the U.S. Army Corps of Engineers necessary for construction of the Jordan Cove Energy Project and Pacific Connector Gas Pipeline.

Section 401 of the Clean Water Act bars federal agencies from issuing a license or permit for an action that may result in a discharge to Oregon waters without first obtaining water quality certification from DEQ. DEQ anticipates Jordan Cove's construction and operation will require authorizations from multiple federal agencies, including but not limited to a Section 404 permit from the U.S. Army Corps of Engineers and authorizations from the Federal Energy Regulatory Commission pursuant to the Natural Gas Act. DEQ is conducting a comprehensive section 401evaluation of the project's direct, indirect and cumulative effects on water quality. DEQ expects to develop a single certification decision based on this comprehensive evaluation of the project that will apply to the Corps and FERC decisions on the project.

DEQ is processing the applications pursuant to Section 401 of the Clean Water Act, 33 United States Code §1341, Oregon Revised Statutes 468B.035 through 468B.047, and DEQ's certification rules found in Oregon Administrative Rules 340, Division 048. To certify the project, DEQ must have a reasonable assurance that the proposed project, as conditioned, will comply with Sections 301, 302, 303, 306 and 307 of the Clean Water Act, Oregon water quality standards, and any other appropriate requirements of state law.

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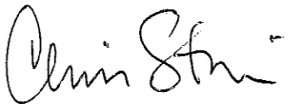
DEQ is reviewing the application submitted Feb. 6, 2018, by David Evans and Associates, Inc. on behalf of Jordan Cove. The information described in the attachments to this correspondence is necessary to complete DEQ's analysis of the project's compliance with applicable standards. Please provide a schedule for a complete response to this additional information request. Please forward your responses to:

Christopher Stine
Oregon Department of Environmental Quality 165
East 7th Avenue, Suite 100
Eugene, Oregon 97401

You may reference previously submitted documents to support your responses to the requests in Attachment A.

DEQ may request additional information as necessary to complete its analysis and fulfill its obligations under state and federal law.

If you have any questions, please contact me directly at 541-686-7810, or via email at stine.chris@deq.state.or.us.



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FERC Dockets: CP17-494-000, CP17-495-000

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ATTACHMENT A

Jordan Cove Energy Project / Pacific Connector Gas Pipeline Additional Information Request

Horizontal Directional Drilling

1. In September 2017, Pacific Connector submitted Horizontal Directional Drilling Feasibility Analysis reports for the proposed Coos Bay East Crossing and Coos Bay West Crossing. According to the reports, the "conclusions should be considered preliminary pending completion of a subsurface exploration program." Please provide a status update on geotechnical drilling and a schedule for finalizing the reports.
2. Pacific Connector describes two options (i.e., single Horizontal Directional Drilling Option and a Dual Horizontal Directional Drilling Option) to accomplish the Coos Bay East Horizontal Directional Drilling crossing. DEQ expects the design criteria supporting the selected procedure will be presented in the final design report. DEQ requests Pacific Connector address the following considerations in determining their proposed methodology.

   Single Horizontal Directional Drilling Option

   a) The single option places the bottom tangent at elevation -190 feet mean sea level. Pacific Connector expects the underlying geology at this depth will consist of competent bedrock, which is deemed critical to the feasibility of the single option. Please describe whether alternate design measures would allow use of the single option if the geotechnical investigation concludes the underlying geology does not consist of competent bedrock.

   Dual Horizontal Directional Drilling Option

   A final Horizontal Directional Drilling design report that proposes the Dual Horizontal Directional Drilling Option should address the following issues.

   b) The dual option relies on a shared tie-in workspace located in a tidal flat area south of Glasgow Point. Describe how the workspace will be isolated from open water during Horizontal Directional Drilling installation.

   c) The likelihood of inadvertent surface returns of drilling fluid is highest near entry points where drilling pressures can exceed the shear strength and pressure from overburden soils. Describe what special contingency measures will be employed to contain drilling fluids in this inter-tidal environment.

   d) What is the proposed final depth below surface of the installation at the tie-in location? What measures, if any, are proposed to ensure the pipeline remains buried for the life of the project?

   e) Describe the scope of open-water activities such as inter-tidal dredging for barge access to the shared tie-in workspace.

   f) Describe what procedures Pacific Connector will employ to avoid, minimize, or

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mitigate the effects of this option on water quality.

3. The Horizontal Directional Drilling Mud Contingency Plan states a berm may be built around the drilling site and hay bales or silt fences may be placed on the river side of the drilling area. Because inadvertent surface returns may reasonably be expected near entry locations, Pacific Connector should identify measures that will be employed and maintained to contain fluids during installation.
4. Inadvertent fluid returns to surface waters are unacceptable. Pacific Connector must develop and implement an Horizontal Directional Drilling plan to continuously monitor engineering conditions during installation and provide for a rapid response in the event fluid loss is confirmed or suspected. The plan should establish procedures to monitor drilling pressure, fluid circulation, pilot hole location, axial loads, visual monitoring or other parameters deemed appropriate to interpret formational or surface loss of drilling fluid.

Waterbody Crossing Plans

The effects of pipeline construction across waterbodies can affect the physical, biological and chemical integrity of the aquatic environment. Pacific Connector will utilize dry open cut methods (fluming, dam and pump, or diverted open cut) on most of the proposed 326 waterbody crossings. Open cutting of streambeds can have direct, indirect and cumulative effects on water quality, habitat and stream hydrology. Changes to channel geometry may cause streams to reestablish equilibrium. These actions can increase sedimentation, reduce water quality, decrease habitat complexity and modify channel hydrology. Because, the effects of open trench waterbody crossings can propagate upstream, downstream, and laterally these impacts, may not be confined to the project area.

Waterbody crossing plans must describe site-specific construction procedures that Pacific Connector will undertake at each proposed crossing. The plans should identify the proposed crossing methodology, dewatering procedures, dewatering discharge sites, spoils placement locations, mobilization and demobilization, and monitoring procedures. The plans should be developed in consideration of local characteristics such as anticipated flow, local, geology, gradient, sensitive environmental conditions, slope stability at dewatering discharge points or other environmental factors that may influence the design and implementation of waterbody crossings. Pacific Connector should describe procedures for crossings that may require unique or challenging procedures (e.g., blasting consolidated rock). Last, site-specific crossing plans must address the removal of dams, dewatering locations, temporary bridges, or other temporary construction elements and include procedures to avoid or minimize sediment mobilization or turbidity

Waterbody crossing plans must also describe site-specific plans to restore each of the proposed waterbody crossings. Each plan must include sufficient local-scale information to provide an accurate baseline assessment of pre-construction environmental and ecological conditions to guide the design of the post-construction restoration. Each stream restoration plan must contain

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site-specific designs and specifications to ensure PCGP fully mitigates the impact of open cut trenching in each stream and protects the beneficial uses. The data generated from the information requested below will support the development of site-specific waterbody crossing plans.

To develop a waterbody crossing plan for each open trench cut stream crossing, Pacific Connector must document and use the site-specific field data described below.

Hydraulic Assessment

Pacific Connector must conduct a hydraulic analysis on each proposed waterbody crossing. Site-specific information of local discharge is required to demonstrate that proposed pumping and fluming designs can adequately bypass anticipated flows. Pre-development local hydrology must also be characterized to inform stream restoration actions.

Pacific Connector should conduct the analysis using one of the following methods:

- Rational Method (for drainages up to 200 acres)
- NRCS Peak Flow Method using HydroCAD (for drainages larger than 200 acres)
- USGS StreamStats for Oregon

The hydraulic analysis should provide the following information:

- Drainage area above each proposed crossing
- Peak flow estimate at the time of construction
- Bankfull width, stage, and corresponding discharge
- Average gradient within the temporary crossing easement
- Mean two-year, five-year and 10-year discharge and velocity at the proposed crossing

Based on the hydraulic conditions at each crossing, Pacific Connector should confirm the design pumping capacity of the proposed fluming or pumping bypass system can sufficiently transfer maximum anticipated flows around the work area. Pacific Connector should further describe alternate or contingency methods in the event field conditions prevent successful dewatering. Waterbody crossing plans must include engineering data to support design criteria of proposed conveyance structures based on gradient, bypass length and anticipated flow.

Pacific Connector must also measure bankfull width, stage, and corresponding discharge at each crossing. Recognizing the bankfull width at each crossing is critical in designing and implementing restoration plans that maintain the geomorphological function of the stream segment.

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Topographic Survey of Stream Channel

Restoring a stream's natural form and function requires a topographic survey of the pre-construction stream channel and floodplain form.[1] Pacific Connector provided this information for the South Umpqua Number 2 River crossing. However, this information is lacking for other crossings involving open trench cutting. This survey information will assist in the reconstruction of the natural stream channel. At minimum, Pacific Connector should include in each topographic survey a longitudinal survey of the stream profile, top and bottom of banks, and the top and bottom floodplain slopes. This topographic information should also include geometric data downstream and upstream of the pipeline crossing to assist the restoration design and to identify potential interactions with adjacent reaches.

Stream Function Assessment

Trenched waterbody crossings can alter stream function in ways that negatively affect aquatic habitats and ecosystems. Potential effects may include modified stream channel geometry, reduced habitat complexity, reduced streambank stability, impaired benthic production and increased sedimentation.

Pacific Connector must conduct a pre-construction ecological assessment of each waterbody crossing using the methodology presented in Stream Function Assessment Method for Oregon Version 1.0.[2] SFAM was developed jointly by EPA and Oregon Department of State Lands. The method provides a scientifically supported rapid assessment tool for gathering information on the functions and values associated with wadeable streams that may be subject to regulatory jurisdiction under Section 404 of the Clean Water Act and Oregon's Removal-Fill Law.

The assessment is needed to establish a pre-development ecological baseline and to inform site-specific practices necessary to mitigate the environmental effects of the action. Pacific Connector can also use this assessment method for post-construction monitoring of Pacific Connector's stream restoration actions over time.

More information can be found at:
https://www.oregon.gov/dsl/WW/Pages/Resources.aspx#assessment.

Biological Assessment

Oregon water quality rules prevent discharges to waters of the state that may reduce support for beneficial uses or cause changes in residential biological communities. To establish pre-construction conditions, Pacific Connector must conduct a benthic macroinvertebrate assessment to comply with the Biocriteria water quality standard (Oregon Administrative Rule 340-0410-0011). Benthic communities form the basis for food webs that support aquatic life and are susceptible to changes in sedimentation. Oregon DEQ has developed procedures to characterize

[1] Yokum, S.E. 2018. Guidance for Stream Restoration. Technical Note TN-102.4. National Stream Aquatic Ecology Center. USDA Forest Service

[2] Stream Function Assessment Method for Oregon Version 1.0. June 2018. U.S. Environmental Protection Agency and Oregon Department of State Lands. EPA 910-D-18-001.

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the health of benthic communities to comply with this standard. Using procedures found in Methodology for Oregon's 2018 Water Quality Report and List of Water Quality Limited Waters,[3] Pacific Connector must perform pre-development benthic surveys using to the PREDictive Assessment Tool for Oregon (PREDATOR). The results of the PREDATOR surveys will enable DEQ to evaluate the direct, indirect, and cumulative effects of the action caused by stream channel modification, habitat loss, sedimentation or other potential project effects.

Streambed Material Assessment

Pacific Connector must characterize bed material composition at each trenched waterbody crossing. Substrate composition is critical to stream hydrology and provides interstitial refuge for egg incubation. Characteristics can vary considerably based on gradient, stream channel geometry, watershed hydrology and other factors. For this reason, site-specific knowledge of local bed material characteristics are necessary to inform restoration and mitigation actions following construction.

For streambeds characterized by unconsolidated substrates, Pacific Connector must conduct a pre-construction quantitative assessment of substrate material. The assessment should address the particle size, sorting, vertical variability and distribution of material.

Open cut trenches in bedrock-dominated stream channels are susceptible to upstream propagation of knickpoints created by joints in the stream's bedrock.[4] Knickpoint propagation in bedrock-dominated streams can cause changes in stream geomorphology and, potentially, barriers to fish migration. Pacific Connector should describe in detail how bedrock-dominated stream channels will be restored to prevent the creation of a joint in the bedrock that leads to the formation and propagation of a knickpoint in these channels.

Habitat Assessment

Naturally occurring material such as large wood and boulders provide gravel recruitment, cover for juvenile fish, thermal refugia, and hydraulic control. Pacific Connector must conduct a detail inventory of aquatic habitat features within the project area of each proposed crossing. Habitat features identified during this predevelopment inventory should be used to ensure restoration efforts result in no net loss of habitat function or complexity. In its Stream Crossing Risk Analysis document, Pacific Connector provides only general descriptions to address, for example, the reinstallation of boulders to maintain an existing bed profile and cascade/pool morphology during the stream restoration process. However, Pacific Connector's habitat assessments must capture such habitat features as noted above in sufficient design detail so that the construction contractor has clear direction in site-specific drawings to restore these habitat

[3] Methodology for Oregon's 2018 Water Quality Report and List of Water Quality Limited Waters, November 2018. Oregon Department of Environmental Quality: https://www.oregon.gov/deq/FilterDocs/ir2018assessMethod.pdf.
[4] Selander, Jacob. 2004. Processes of Knickpoint Propagation and Bedrock Incision in the Oregon Coast Range. Department of Geologic Sciences. University of Oregon

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features during the stream restoration process.

Water Quality

Site-specific water body crossing plans should address the following water quality issues at each crossing proposed:

- Oregon DEQ may issue a section 401 water quality certification that allows the numeric turbidity criteria to be exceeded provided all practicable turbidity control techniques have been applied. Please identify what engineering controls (e.g., settling, filtration, flocculation, etc.) are proposed to reduce turbidity in streams during mobilization and removal of construction equipment.

- Describe procedures to backfill trenches in a manner that maintains predevelopment streambed material and habitat function. For example, backfilling procedures must clearly address how Pacific Connector will prevent the restored stream flow from moving completely into the subsurface of restored streambed material and creating a fish passage barrier. Additionally, crossing plans should clearly describe how fill material will be placed to prevent streambed and bank scour, sedimentation, and channel modification.

- For trench dewatering structures, please identify how sediment and fines removed from the isolated work area will be permanently managed following work completion.

Comments

1. Appendices C.2 and D.2 (Stream Fluming Procedures, Dam and Pump Procedures) of Resource Report 2 state, "Turbidity sampling will be conducted during all . . . crossings in accordance with the Stormwater Pollution Prevention Plan." DEQ cannot find the Stormwater Pollution Prevention Plan in Pacific Connector's application submittal to evaluate the proposed turbidity sampling.
2. Fluming and dam and pump procedures rely on upstream and downstream dams to isolate temporarily work areas during construction activities. Oregon's fish passage requirements found in Oregon Revised Statute 509.585 prevent activities that impede the volitional movement of fish. Pacific Connector should describe how proposed fluming and dam and pump procedures will comply with Oregon fish passage law.
3. Stream Classifications in Table A.2-2 in Resource Report 2 reference methods established by Oregon Department of Forestry and the Northwest Forest Plan. DEQ's biologically based numeric criteria are based on fish distribution maps developed by Oregon Department of Fish and Wildlife. Please consult with ODFW to identify fish use and classifications at the proposed waterbody crossing locations.
4. Appendix C.2 of Resource Report 2 (Fluming Procedures) indicates that scrap metal pipe may be used to construct flumes and that pipes may be steam-cleaned to remove oil and grease. Please identify on the crossing plans where Pacific Connector will discharge this wash water. DEQ expects that Pacific Connector will apply for and obtain coverage under the appropriate permit (i.e., either Water Pollution Control Facility or National

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Pollutant Discharge Elimination System) based on the proposed activity.

5. Figure 8 of Appendix C.2 of Resource Report 2 (Fluming Procedures) illustrates procedures to divert stormwater runoff from the construction easement into the isolated stream section. Please note that NPDES 1200-C General Permit does not authorize the discharge of stormwater to waterways. Pacific Connector must control runoff from upland work areas to prevent discharge to stream channels.

Oregon
Kate Brown, Governor

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March 13, 2019

Derik Vowels
Jordan Cove LNG, LLC
Consultant, Lead Environmental Advisor
111 SW 5th Ave., Suite 1100,
Portland OR 97204

Re: Additional Information Request #4
Jordan Cove Energy Project (FERC Project No. CP17-494)
Pacific Connector Gas Pipeline (FERC Project No. CP17-495)
U.S. Army Corps of Engineers (Project No. NWP-2017-41)

Dear Mr. Vowels:

The Oregon Department of Environmental Quality is currently reviewing an application from Jordan Cove LNG, LLC for Clean Water Act section 401 water quality certification for a Section 404 permit from the U.S. Army Corps of Engineers necessary to construct the Jordan Cove Energy Project and Pacific Connector Gas Pipeline (collectively, "the Project"). DEQ is evaluating the land use compatibility statements and application materials related to land use to determine if they meet state law requirements.

DEQ requests the following supplemental information on land use.

1. Provide a map of the Pacific Connector Project showing zoning designations and overlays applicable to the project.
2. In Resource 8, Jordan Cove provided maps with zoning designations. Have these maps been update to reflect any changes to land use and to include supplemental project updates (i.e., worker park and ride locations, rock apron to arrest channel mitigation, eelgrass donor and embayment areas, and mitigation sites)? See Jordan Cove Energy Project, Resource 8, Figures 8.1-3a and -3b.
3. Provide an exhibit that identifies the specific provisions of the local land use plans and implementing regulations applicable to the activity and a discussion of the potential direct or indirect relationship to water quality of each finding or land use provision per OAR 340-048-0020(2)(i).
4. Provide updated analyses for capability determinations that date back to 2015. Pacific Connector provided analyses in 2015 with updates in the Jan. 2019 LUCs submission for Klamath, Jackson, and Douglas County for the non-coastal zone. No updates were provided for Douglas County coastal zone or Coos County. The updated analyses need to affirmatively review whether any project changes since 2015 would affect those prior analyses.
5. Provide analyses for capability determinations for Coos County for Jordan Cove.

Please provide a schedule for a complete response to this supplemental information to:

Mary Camarata
Oregon Department of Environmental Quality
165 East 7th Avenue, Suite 100
Eugene, Oregon 97401

If you have any questions, please contact me directly at (541) 687-7435, or via email at camarata.mary@deq.state.or.us.

Mary Camarata
Project Coordinator

ec: Mike Koski, mkoski@pembina.com
Natalie Eades, Neades@pembina.com
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John Peconom, John.Peconom@ferc.gov
Sean Mole, sean.mole@oregon.gov
DEQ: Keith Andersen, Dave Belyea, Steve Mrazik, Chris Bayham, Mary Camarata, Sara Christensen
FERC Dockets: CP17-494-000, CP17-495-000

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Oregon
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June 12, 2019

Sean Mole
Jordan Cove Analyst
Oregon Department of Energy
550 Capitol St NE, 1st floor
Salem, OR 97301

RE: DOGAMI Comments on the Draft Environmental Impact Statement (DEIS) for the Proposed Jordan Cove Energy Project (JCEP) and Pacific Connector Gas Pipeline (PCGP)

Dear Mr. Mole:

The Oregon Department of Geology and Mineral Industries (DOGAMI) is providing review comments on the Draft Environmental Impact Statement (DEIS), dated March 2019, and relevant supplemental resource reports, dated September 2017.

DOGAMI finds the information in the DEIS to be incomplete; has comments on DOGAMI's regulatory requirements; has comments about possible deficiencies in the scientific and engineering analyses relating to geologic hazards; and at this point is not satisfied that regulatory requirements will be met and geologic hazards will be adequately addressed to ensure public safety. We provide herein 1) General Review Comments, and 2) Specific Comments on the DEIS.

As noted in our comments, DOGAMI is reiterating a number of unresolved comments on JCEP and PCGP resource reports that were first included in a memo to the Oregon Department of Energy (ODOE), dated November 6, 2017 (https://www.oregon.gov/energy/facilities-safety/facilities/Documents/JCEP-PCGP/2017-11-06-DOGAMI-Comments.pdf). At that time, DOGAMI found that many geologic hazard analyses were inadequate. Now, DOGAMI is concerned that key portions of the DEIS were insufficiently prepared, and in some cases either wrong or inadequate. This raises questions about the process undertaken to develop the DEIS and, more importantly, elevates DOGAMI's concerns about public safety.

DOGAMI has regulatory and statutory authority on mining operations and building of certain structures in the tsunami inundation zone. The Applicant must comply with Oregon laws and Oregon building code requirements. This includes Oregon Revised Statute Chapter 517.750(16)—

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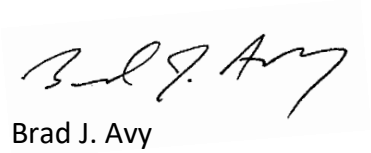
the JCEP project will need one (1) Operating Permit for the LNG terminal facility and the PGCP project will need one (1) or more Operating Permits for the pipeline facility, any applicable requirements of ORS 455.446-455.447 and Section 1803.2.1 Tsunami Inundation Zone of the Oregon Structural Specialty Code (Oregon Revised Statutes [ORS] 455.446 and 455.447).

Thank you for the opportunity to assist with this project. If you have any questions, please contact me at 971-673-1555 (brad.avy@oregon.gov) or Yumei Wang at 503-913-5749 (yumei.wang@oregon.gov).

Sincerely,



Brad J. Avy
Director and State Geologist

cc: Sarah Lewis, Program Manager, Mineral Land Regulation and Reclamation
Alyssa Pratt, Acting Program Manager, Geological Survey and Services
Yumei Wang, Resilience Engineer, DOGAMI JCEP/PCGP Coordinator

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General Review Comments

Geologic hazards are prevalent in the proposed project area. The proposed project is in a high seismic hazard area due to the Cascadia Subduction Zone, which can produce a magnitude 9 earthquake, and the proposed JCEP terminal facility is located in the Cascadia tsunami inundation zone. If all geologic hazards are not carefully identified and addressed before design and construction, then the possible impacts could negatively impact human and environmental safety. Significant earthquake hazards include but are not limited to the Cascadia Subduction Zone and crustal faults (e.g., Basin and Range faults), especially in Klamath County. Landslide hazards exist in the coastal plains, Coast Range, Klamath Range, Cascade Range and Basin and Range.

DOGAMI's concerns relate to the expected performance of the proposed facilities, the possible impacts and the safety of people. Geologic hazards have not been adequately characterized and proposed mitigation of the hazards is incomplete. Specific unresolved concerns include:

1. Key portions of the DEIS were insufficiently prepared, and in some cases either wrong or inadequate, raising questions about the process undertaken to develop the DEIS (i.e., a lack of sufficient Applicant technical review), which could lead to adverse consequences for public safety;
2. Seismic hazards, including Cascadia earthquakes and identification, characterization and mitigation of quaternary faults and their hazards;
3. The long duration of shaking expected with a magnitude 9 earthquake;
4. Ground failure of the softer and looser soils, including earthquake-induced liquefaction and lateral spreading;
5. Landslide hazards, including earthquake-triggered landslides, require the use of lidar to identify as a first step in characterizing hazards and proposing mitigation;
6. Tsunami hazards analyses, including tsunami hazards with the proposed channel and estuarine modifications, and how currents, debris and ballistics may negatively impact the surrounding areas and safety of people;
7. Tsunami scour in the nearby area, including dynamic erosion of the North Spit dunes, and how the Maximum Considered Tsunami (MCT), that is, the design tsunami, may impact the local landforms, proposed facilities, nearby development and safety of people;
8. Tsunami design criteria. Will the design meet and/or exceed the minimum design requirements specified in the International Building Code's reference to the American Society of Civil Engineers 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures Chapter 6 on Tsunami Loads and Effects?;
9. Tsunami safety action plans, including tsunami evacuation plans and an evaluation of the response time to mobilize an LNG vessel during a distant tsunami;

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10. Appropriate application of best management practices (BMP). For example, the best practice described in the DEIS using slope gradients to define where BMPs are implemented during construction is inadequate;
11. Instrument monitoring safety programs. For example, the landslide monitoring method described in the DEIS would not allow adequate time to mitigate landslide hazards during a Cascadia earthquake where many co-seismic landslides could be simultaneously triggered in direct response to the shaking; and,
12. Dependencies on existing infrastructure, such as roads and levees, which may fail during disasters causing safety concerns.

DOGAMI encourages designing and building for ***disaster resilience*** and ***future climate*** using science, data and community wisdom to protect against and adapt to risks. This will allow people, communities and systems to be better prepared to withstand catastrophic events and future climate—both natural and human-caused—and be able to bounce back more quickly and emerge stronger from shocks and stresses. This includes:

- Using best practices supporting public safety
- Using a long-term view to protect citizens, property, environment, and standard of living
- Integrating resilience, where possible, by avoiding high risk areas or embracing higher performance standards than may be required by building codes and regulations. This will lessen damage and speed recovery after disasters and improve continuity of operations.

Finally, all relevant laws and regulations (e.g., State of Oregon's Oregon Revised Statutes, Oregon Administrative Rules, Oregon building codes, Federal Laws, and local regulations), standards, guidelines should be met, clearly documented and, where helpful, explained. Additional site-specific geologic and tsunami hazard evaluations and proper mitigation of hazards are required to ensure public safety. All methods should be documented and described, including assumptions and uncertainties.

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Specific Comments on the DEIS

Citation	Issue Identification	Recommended Resolution
1.5.1 Federal Environmental Laws, Regulations, Permits, Approvals, and Consultations: Table 1.5.1	Oregon Department of Geology and Mineral Industries – Mineral Land Regulation and Reclamation (MLRR) Program is not listed as a permitting agency in Table 1.5.1. The JCEP project will need one (1) Operating Permit for LNG terminal facility and the PGCP project will need one (1) or more Operating Permits for the Pipeline per Oregon Revised Statutes (ORS) Chapter 517.750	Include DOGAMI – MLRR as a State permitting agency in Table 1.5.1
1.5.2 State Agency Permits and Approvals: Section 1.5.2.1, Page 1-30	Add DOGAMI-MLRR to text in Section 1.5.2. The JCEP project will need one (1) Operating Permit for LNG terminal facility and the PGCP project will need one (1) or more Operating Permits for the pipeline per Oregon Revised Statutes (ORS) Chapter 517.750	Add DOGAMI MLRR to section 1.5.2.1, page 1-30: The mission of the DOGAMI is to provide earth science information **and regulation** to make Oregon safe and prosperous. DOGAMI identifies and quantifies natural hazards, and works to minimize potential effects of earthquakes, landslides, and tsunamis. Its administrative rules at OAR chapter 632 includes the identification of Tsunami Inundation Zones under division 5. The agency is also the steward of Oregon's mineral resources, and it regulates mining activities, and oil and gas exploration and production on non-federal lands. **The JCEP**

		and PGCP projects fall under the definition of "surface mining" under ORS Chapter 517.750(16). The JCEP project will need one (1) Operating Permit for the LNG terminal facility and the PGCP project will need one (1) or more Operating Permits for the pipeline facility.
2.1.3 BLM and Forest Service Land Management Plan Amendment Actions (whole section)	Any quarry sites, on land managed by the BLM or Forest Service, used as aggregate material sources for ANY construction activities related to either the JCEP or the PGCP facilities, will need to obtain either Exclusion Certificates (excavating less than or equal to 5,000 cubic yards) or mine Operating Permits (excavating more than 5,000 cubic yards) from DOGAMI – MLRR. Note quarries permitted under DOGAMI permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used for permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	Identify ALL quarry site locations via coordinates (latitude and longitude) that will be used as sources of construction aggregate. Identify ALL quarry site locations via coordinates (latitude and longitude) that will be used as fill disposal. Ensure that ALL quarry sites used as sources of construction aggregate are covered under Exclusion Certificates or mine Operating Permits issued by DOGAMI – MLRR. Any of those sites used for the disposal of fill must have approved fill plans on file with DOGAMI – MLRR.
2.4 CONSTRUCTIO N PROCEDURES (whole section)	Any quarry sites used as aggregate material sources, for construction activities related to either the JCEP or the PGCP facilities that excavate more than 5,000 cubic yards of material need to obtain mine Operating Permits prior to initiating excavation/construction activities.	Place a requirement and/or a condition ensuring that ALL quarry sites used as aggregate material sources, for construction activities related to either the

		JCEP or the PGCP facilities that excavate more than 5,000 cubic yards of material obtain mine Operating Permits prior to initiating excavation/construction activities.
3.4 PIPELINE ROUTE ALTERNATIVES AND VARIATIONS (whole section)	The PGCP requires one (1) or more Operating Permits from DOGAMI (as noted above). DOGAMI cannot have overlapping permit boundaries covering the same land. Therefore, the pipeline route must avoid intersecting the permit boundary of any quarry site that is covered under a DOGAMI Operating Permit. Any areas where there is the potential for overlap of two or more Operating Permit boundaries must be resolved in advance of DOGAMI permitting.	Require that the pipeline route avoid the permit boundary for any quarries covered by existing DOGAMI Operating Permits.
Section 4.1.2.2 Mineral Resources – Mine Hazards - Heppsie Quarry (pg 4-10) pdf pg. 198/1120	The Heppsie Quarry site will need to be covered under a DOGAMI Operating Permit prior to the excavation of aggregate for construction activities.	Place a requirement and/or a condition ensuring that ALL quarry sites used as aggregate material sources for construction activities related to either the JCEP or the PGCP facilities that excavate more than 5,000 cubic yards of material obtain mine Operating Permits prior to initiating excavation/construction activities.
Section 4.1.2.5 Rock Sources and Permanent Disposal Sites (pg 4-25 and 4-26) pdf pg. 213/1120	As noted above: Any quarry sites used as aggregate material sources for ANY construction activities related to either the JCEP or the PGCP facilities, will need to obtain either Exclusion Certificates (excavating less than or equal to 5,000 cubic yards) or mine Operating Permits (excavating more than 5,000 cubic yards) from DOGAMI – MLRR prior to the initiation of excavation activities. Further, quarries permitted under DOGAMI Operating Permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used for	Place a requirement and/or a condition ensuring that ALL quarry sites will have the appropriate certificate or permit issued by DOGAMI in advance of initiating excavation activities. Any of those sites used for the disposal of fill

	permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	must have approved fill plans on file with DOGAMI – MLRR.
Section 4.1.2.6 Blasting During Trench Excavation pg 4-27 pdf pg. 215/1120	Ensure that there are no impacts from blasting to properties not owned or under the control of the PGCP permittee. Ensure that ALL federal guidelines for quarry blasting are followed (NFPA 495 Ch. 11).	Place a requirement and/or a condition prohibiting impacts beyond the right-of-way boundary under the control of the PGCP permittee. Place a requirement and/or a condition requiring that the federal guidelines for quarry blasting are followed (NFPA 495 Ch. 11).
Section 4.1.3.2 Mineral Resources on Federal Lands pg 4-35 pdf pg. 223/1120	Any quarry sites, on land managed by the BLM or Forest Service, used as aggregate material sources for ANY construction activities related to either the JCEP or the PGCP facilities, will need to obtain either Exclusion Certificates (excavating less than or equal to 5,000 cubic yards) or mine Operating Permits (excavating more than 5,000 cubic yards) from DOGAMI – MLRR. Note quarries permitted under DOGAMI permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used for permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	Place a requirement and/or a condition ensuring that ALL quarry sites used as aggregate material sources, for construction activities related to either the JCEP or the PGCP facilities that excavate more than 5,000 cubic yards of material obtain mine Operating Permits prior to initiating excavation/construction activities.
Section 4.1.3.3 Rock Sources and Permanent Disposal Sites on Federal Lands pg 4-36 pdf pg. 224/1120	Quarries permitted under DOGAMI permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used for permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	Place a requirement and/or a condition ensuring that ALL quarry sites covered under DOGAMI Operating Permits have a fill plan approved by DOGAMI prior to being used for permanent fill disposal.

4.2.1.2 Project-Specific Soil Limitations pg 4-44 pdf pg. 222/1120	The DEIS notes that some soils at the JCEP terminal site may not meet DEQ's definition of Clean Fill (OAR 340-093-0030(18). A fill plan per OAR 632-030-0025(bb) is required as part of the Operating and Reclamation Plan prior to placement of permanent reclamation fill. All fill must meet DEQ's definition of clean fill or be specifically authorized for placement in writing by ODEQ.	Place a requirement and/or a condition ensuring that a fill plan per OAR 632-030-0025(bb) is required as part of the Operating and Reclamation Plan submitted to DOGAMI as part of the Operating Permit application for the Terminal site.
4.2.2.3 Pipeline-Specific Topics -Soil Limitations - Reclamation Sensitivity pg 4-60 pdf pg. 248/1120	The approved EIS revegetation plan for areas identified to be revegetated in this section should be included in the Operating and Reclamation Plan submitted to DOGAMI as part of the Operating Permit application for the Terminal site.	Place a requirement and/or a condition ensuring that the revegetation plan be consistent with the Operating and Reclamation Plan submitted to DOGAMI as part of the Operating Permit application for the Terminal site.
Appendix D Table D-7 Rock Sources and Permanent Disposal Sites identified for the construction of the pipeline pg D7-1/7-2	These sites will need to obtain either Exclusion Certificates (excavating less than or equal to 5,000 cubic yards) or mine Operating Permits (excavating more than 5,000 cubic yards) from DOGAMI – MLRR. Note quarries permitted under DOGAMI permits must have approved fill plans (OAR 632-030-0025(bb)) prior to the placement of imported fill used for permanent reclamation purposes. Imported fill must meet DEQ's definition of Clean Fill (OAR 340-093-0030 (18)) or the use must be specifically allowed by Department of Environmental Quality by rule, permit or other written authorization.	Place a requirement and/or a condition ensuring that ALL quarry sites will have the appropriate certificate or permit issued by DOGAMI in advance of initiating excavation activities. Any of those sites used for the disposal of fill must have approved fill plans on file with DOGAMI – MLRR.
Appendix F.10, Appendix Q Overburden and Excess Material Disposal Plan	DOGAMI issues life of mine permits. Material placed in DOGAMI permitted sites as reclamation backfill cannot be considered temporary. Permanent areas should be identified for those currently designated as "Permanent or Temporary".	Acknowledge that material placed in DOGAMI permitted sites as reclamation backfill cannot be considered temporary. If the placement is temporary the material

		must be removed from the disposal site prior to the closing of the DOGAMI permit.
4.14 CUMULATIVE IMPACTS – Appendix N, Table N-1 pg N-1 to N-8	Activities listed in the past, present, or reasonably foreseeable actions that may need to be permitted by DOGAMI. Instances where the pipeline is in proximity to existing quarry operations may require modification to those quarries blasting plans to prevent impacts to the pipeline. Any aggregate sources used for construction may need DOGAMI Exclusion certificates or Operating Permits. Any additional gas wells or activity associated with the (MEC) coal bed methane sites may need additional permits from DOGAMI.	Acknowledge that past, present, or reasonably foreseeable actions may require additional permitting and/or approvals from DOGAMI – MLRR.
DEIS Section 13.3 Natural Hazards and Conditions; starting on page 17	DOGAMI concludes that the current level of geologic hazard evaluations and proposed mitigation are inadequate to ensure public safety.	DOGAMI recommends that additional site-specific geologic and tsunami hazard evaluations and proper mitigation of hazards are performed to ensure public safety.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. DEIS states that there are two primary mechanisms for generating earthquakes of design significance along pipeline route, CSZ event and local earthquakes associated with Klamath Falls seismic “hot spot”. This list should include intraplate earthquakes in the subducting slab, and seismicity in the Klamath Falls area is only a seismic “hot spot” because of the occurrence of two M 6 earthquakes in 1993 and their associated aftershocks, otherwise the seismicity of the area is not unusual.	Revise assessment of major earthquake source zones with accurate and properly referenced information and include intraplate earthquakes.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS incorrectly states that there were two large (M 6.3 and 7.0) earthquakes in the area in 1873. There was only one, its location and magnitude are poorly	Revise description of major historic earthquakes with accurate and properly referenced information.

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	constrained, and it has been interpreted by many as an intraplate event.	
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS notes that most of the pipeline construction area has experienced few historical earthquakes but fails to note that the period of historical record is short in this lightly populated region, and that the historical record is probably only complete for magnitudes > ~4.	Revise description of major historic earthquakes with accurate and properly referenced information. That includes discussion of the completeness and length of record.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS appears to base its assessment of geologically mapped faults along the pipeline alignment on an outdated and very small scale statewide geologic map (Walker and McLeod 1991).	Revise assessment of geologically mapped faults with up to date information from DOGAMI digital geologic map (OGDC-6) at a minimum, preferably by reference to all existing geologic maps along alignment. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS states that most faults along the pipeline alignment are not considered active in the USGS Quaternary fault database. DOGAMI staff have identified dozens of active faults in Oregon over the last decade using high resolution lidar data, virtually none of which were in the USGS database. The database is incomplete and inaccurate and should not be used as the sole source of information about fault activity.	Revise assessment of geologically mapped faults by study of the high resolution lidar topography for the entire pipeline alignment. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-11	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate or detailed to ensure public safety. The DEIS states that many earthquakes of M 2 or larger have occurred during historical times in the Klamath Falls area, in direct conflict with an earlier statement	Accurately and consistently characterize historical seismicity in the Klamath Falls area and assess its tectonic significance with

	that very few historical earthquakes have occurred along the pipeline alignment. It notes a geographic association of these events with the boundary between the Basin and Range and Cascade Range but fails to note that the virtually all recorded earthquakes in the area are aftershocks from the 1993 M 6 events.	updated references. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-12	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate, detailed or referenced to ensure public safety. The DEIS lists earthquake-induced landslides as one of the primary seismic hazards to pipelines. This statement is true, and earthquake-induced landslides are arguably one of the greatest threats to the proposed pipeline, yet there is no evaluation of the hazard in the Seismic and Related Hazards section and only a cursory and totally inadequate mention in the landslide hazard section.	Provide an in-depth, quantitative evaluation of the potential for earthquake induced landslides along the segments of pipeline where expected ground shaking is high enough to potentially trigger such events. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-12	DOGAMI concludes that inaccurate and incomplete information in the DEIS raises concern that the seismic hazard evaluations presented in the DEIS are not sufficiently accurate, detailed or referenced to ensure public safety. The DEIS asserts that empirical studies "demonstrate that welded steel pipelines are not prone to failure during earthquakes", which overstates conclusions of the references cited to support it. One of the two studies cited indicated that during the 2011 Tohoku M 9 subduction earthquake, welded steel water pipe experienced failures at a rate of 1 per ~ 10km, which contradicts the assertion that such pipelines are not prone to failure.	Revise the assessment of pipeline vulnerability with consistent and properly referenced information. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparent lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS notes the distinction between earthquake magnitude and ground motion, which while correct is such a basic distinction that it is questionable to be included in an engineering seismology discussion for a major project like this. Probabilistic spectral ground motions are the standard of practice for this kind of design, and the DEIS should	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.

	detail how the study was done, including methods, data and assumptions used.	
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS states that the pipeline would be designed using PGA values that correspond to an M 8-9 CSZ earthquake and a specific return period (a deterministic hazard assessment, though the range of M 8-9 is huge), but the standard of practice for such design is to do a probabilistic seismic hazard assessment (PSHA). Regardless of whether the intent is to design using deterministic or probabilistic ground motions, the DEIS should present the most current recurrence and probability data for Cascadia earthquakes. There is no discussion, in this section or Section 4.13.1.5 (Earthquakes, Tsunami and Seiche) of Cascadia recurrence or probability. The issue of up-to-date Cascadia recurrence information was raised in the DOGAMI November 6, 2017 review memo (comment 19), and has still not been adequately addressed.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data, and specifically addressing Cascadia recurrence.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS asserts that the USGS has prepared a PSHA for the US in general (true) and “for the region that would be crossed by the pipeline in particular” which is true only in that the pipeline area is in the US. The DEIS also cites the wrong reference for the USGS National Seismic Hazard Maps (NSHM), instead referencing the Quaternary Fault Database, which is one dataset underpinning the NSHM.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS states, “PGAs for the Project were calculated for the specific 475-year and 2,475-year return periods and the site-specific PGA of 0.5g for each corresponding milepost interval of the pipeline alignment”. This statement does not make sense. The issue of providing clear and complete ground motion information was raised in the DOGAMI	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.

	November 6, 2017 review memo (comment 10), and has still not been adequately addressed.	
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS and the lack of accurate use of data suggests that it may not be relied on to ensure public safety. The DEIS states "The highest 475-year return period PGAs expected along the pipeline alignment are about 17 percent (MP 0 to 2.0 and MP 9R to 16BR) of gravity." This is not supported by data and appears to be incorrect. The USGS NSHM 2014 PGA data for the 10% in 50 years return period has values that range from 10.5%g to 29.5%g for sites within 5 km of the pipeline alignment. The issue of providing clear and complete ground motion information was raised in the DOGAMI November 6, 2017 review memo (comment 10) and has still not been adequately addressed.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data. Accurately report data from USGS NSHM.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-13	DOGAMI is concerned that the apparently lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS follows the previously referenced statement about probabilistic PGA values for the pipeline with "The University of Washington (2001) noted that these intensities are moderate and relate Instrumental Intensity VIII and a "Moderate to Heavy" potential damage to aboveground structures as described by the Modified Mercalli Intensity scale". There is no place in a modern PSHA discussion for the conflation of probabilistic ground motions with seismic intensities, which very crudely quantify earthquake effects. Intensity is completely irrelevant to designing a pipeline, and its inclusion in this paragraph suggests that the DEIS preparer has little expertise in seismic hazard assessment.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-14	DOGAMI is concerned that the reliance on literature for determining whether there are active faults along the pipeline alignment may miss potentially hazardous fault crossings and result in a pipeline design that fails to ensure public safety. High resolution lidar is publicly available for approximately 99% of the pipeline alignment, and it should be evaluated by a trained professional geologist for geomorphic evidence of	Conduct a detailed evaluation of lidar topographic data along the pipeline alignment for evidence of Quaternary surface faulting. Follow up on any identified features

	young faults beyond those identified in the literature. In the last 10 years, DOGAMI has identified dozens of previously unknown active faults by this method, and we know that the USGS Quaternary fault database contains only a small percentage of the actual active faults present in Oregon. The issue of inadequate fault hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 23, 24, 25, 34) and has still not been adequately addressed.	with appropriate field investigations including trenching if warranted. The assessment must be prepared by a qualified and licensed professional.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-14	DOGAMI is concerned that the DEIS has overlooked or ignored published information about Quaternary faults crossed by the pipeline alignment, and this oversight fails to ensure public safety. Near mile 215, the pipeline alignment crosses the Adams Point Fault, which forms 2-4 m scarps in latest Quaternary lake sediments (DOGAMI Open File Report 03-03). The issue of inadequate fault hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 23, 24, 25, 34) and has still not been adequately addressed.	Properly evaluate the hazard associated with the Adams Point fault and design any necessary mitigation measures.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-16	DOGAMI is concerned that scope limiting assumptions about liquefaction hazards may result in liquefaction assessment that is not adequate to ensure public safety. The DEIS states “Areas along the proposed pipeline that are subject to being under water-saturated soils within the pipeline depth…” which implies that there is no concern about liquefaction occurring below the depth of the pipeline trench. Lateral spreading resulting from liquefaction at depths below the pipeline trench could pose a serious threat to the pipeline even if the soil surrounding the pipeline itself was not liquefied. The issue of inadequate liquefaction hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 2, 12, 13, 26) and has still not been adequately addressed.	Liquefaction potential should be evaluated for the entire susceptible section where ever the alignment crosses susceptible soils.
DEIS Section 4.1.2.3 Seismic and Related Hazards; page 4-16	DOGAMI concludes that inadequately evaluated or referenced liquefaction evaluations are not adequate to ensure public safety. Table 4.1.2.3-2 lists river or stream crossings with potential liquefaction/lateral spreading hazards but no references or supporting borehole, geotechnical or geologic data for the sites are provided. It is not possible to determine whether the liquefaction potential assessments are adequate in the absence of such data. The issue of inadequate liquefaction hazard	Provide a detailed, accurate and comprehensive liquefaction hazard analysis and mitigation design with supporting data. The assessment must be prepared by a qualified and licensed

	analysis was raised in the DOGAMI November 6, 2017 review memo (comments 2, 12, 13, 26, 28, 29) and has still not been adequately addressed.	professional. For site specific liquefaction and liquefaction consequences evaluations, DOGAMI considers methods outlined in the following as state-of-practice: National Academies of Sciences, Engineering, and Medicine. 2016. *State of the Art and Practice in the Assessment of Earthquake-Induced Soil Liquefaction and Its Consequences*. Washington, DC: The National Academies Press. https://doi.org/10.17226/23474. https://www.nap.edu/catalog/23474/state-of-the-art-and-practice-in-the-assessment-of-earthquake-induced-soil-liquefaction-and-its-consequences
Section 4.13.1.5 FERC Engineering and Technical Review of the Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-735	DOGAMI concludes that the evaluation of potentially active faults near the terminal facility is inaccurate and incomplete and may not ensure public safety. The discussion of the Barview Fault misstates the age of the youngest features offset by the fault by millions of years. The DEIS also ignores the Charleston Fault, which offsets Quaternary surfaces 19 m and whose northward projection offshore passes within a few km of the terminal site. The DEIS also makes no note of paleoseismic data that suggests quaternary offset across a buried fault in Pony Slough, immediately south of the terminal site. (Briggs, 1994 PSU Thesis https://pdxscholar.library.pdx.edu/open_access_etds/4739/) The issue of inadequate fault hazard analysis was raised in the DOGAMI November 6, 2017 review memo	Conduct seismic hazard analyses that include paleoseismic studies of potentially active faults that might impact the proposed facilities. Evaluate the potential presence of buried extensions of the Charleston fault or Pony Slough fault near the site. The assessment must be prepared by a qualified and licensed professional.

	(comments 23, 24, 25) and has still not been adequately addressed.	
Section 4.13.1.5 FERC Engineering and Technical Review of the Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-735	DOGAMI is concerned that the apparent lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS twice mentions "Affection faulting" or "affecting faulting" which are not terms in use in seismic hazard assessment.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for terminal facilities using accurate and up to date methods and data.
Section 4.13.1.5 FERC Engineering and Technical Review of the Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-737	DOGAMI is concerned that the DEIS does not mention certain critical ground motion parameters that are essential for a design that will ensure public safety. For large magnitude Cascadia Subduction Zone earthquakes, the duration of shaking can be in the range of 3-5 minutes, which has a huge impact on the performance of structures and soils. The DEIS has no discussion of this problem. This issue was raised in the DOGAMI November 6, 2017 review memo (comment 1) and has still not been adequately addressed.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for terminal facilities using accurate and up to date methods and data and addressing all relevant ground motion parameters including duration of shaking.
Section 4.13.1.5 FERC Engineering and Technical Review of the Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-738	DOGAMI is concerned that the apparent lack of familiarity with seismic hazard assessment procedures evidenced in the DEIS suggests that it may not be relied on to ensure public safety. The DEIS includes a long discussion of the correlation between PGA, Mercalli Intensity and Richter magnitude. This has no relevance to a modern seismic hazard assessment for a project of this scale and importance and calls into question the credibility of this section of the report. Probabilistic spectral ground motion parameters are the standard of practice for evaluating and designing this kind of facility.	Provide a probabilistic ground motion assessment prepared by a qualified and licensed professional for the entire pipeline using accurate and up to date methods and data.
Section 4.13.1.5 FERC Engineering and Technical Review of the	DOGAMI is concerned that the cursory treatment of liquefaction hazards at the JCEP terminal site is not adequate to ensure public safety. Liquefiable soils have been identified throughout the site, and CSZ M 8-9 earthquake ground motions will certainly be large enough to trigger liquefaction. The DEIS appears to	Provide a detailed, accurate and comprehensive liquefaction hazard analysis and mitigation design with supporting

Preliminary Engineering Designs (Earthquakes, Tsunami and Seiche); page 4-739	leave the management of this known and great hazard to future design work. Liquefaction, along with tsunami inundation and earthquake induced landslides are among the greatest threats to the project's integrity and safety, and all should be rigorously evaluated and have detailed mitigation measures developed prior to approval. The inadequate treatment of this severe acknowledged hazard in the DEIS is completely inconsistent with the risk it poses to the public safety and the scale of mitigation required. The issue of inadequate liquefaction hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comments 2, 12, 13, 26) and has still not been adequately addressed.	data. The assessment must be prepared by a qualified and licensed professional.
DEIS page 1-22 Table 1.5.1-1	The Applicant suggests "Review of Structural Designs in Tsunami Zone" is within DOGAMI's purview, which is incorrect.	Based on Building Code Division requirements, the Applicant may be required to consult with DOGAMI "for assistance in determining the impact of possible tsunamis on the proposed development and for assistance in preparing methods to mitigate risk at the site of a potential tsunami."
DEIS page 1-22 Table 1.5.1-1	The DEIS incorrectly refers to Building Code Section 1802.1 for DOGAMI's authority on "Review of Structural Designs in the Tsunami Zone" (which as noted in the above comment is incorrect). Building Code Section 1802.1 includes definitions.	Cite correct Building Code Sections and refer to the correct authorities. Based on Building Code Division requirements, the Applicant may be required to consult with DOGAMI "for assistance in determining the impact of possible tsunamis on the proposed development and for assistance in preparing methods to mitigate

		risk at the site of a potential tsunami."
DEIS page 4-739	Jordan Cove conducted hydrodynamic and tsunami modeling studies for the Project site and indicated a tsunami generated by a megathrust earthquake on the CSZ would present the greatest tsunami inundation risk at the project site and the maximum design tsunami run-up elevation for the project site is no greater than 34.5 feet NAVD 88 including co-seismic subsidence and sea level rise effects.	Provide a detailed tsunami hazard analyses prepared by a qualified professional for the proposed facilities and its surroundings. Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Explicitly specify in the DEIS report, which earthquake scenario (L1, XL1, XXL1 or ASCE7) was used for modeling the runup elevation. Per reports +34.5 ft navd88 corresponds to the L1 model scenario.
DEIS page 4-739	For the Project site and in accordance with more recent tsunami modeling completed for the Southern Oregon Coast (Witter et al. 2011), the estimated subsidence would be on the order of 7.6 feet.	Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Explicitly specify in the DEIS report, that the referenced subsidence is associated with an L1 earthquake scenario.
DEIS page 4-739	Jordan Cove also indicated that furthermore tsunami protection berms, safety critical elements of the facility, point of support elevations, invert levels and underside of essential equipment, would be at least 1 foot above	Explicitly specify in the DEIS report, which earthquake scenario (L1, XL1, XXL1 or

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	the estimated maximum run-up elevation and most will be far above that elevation.	ASCE7) is being referenced here.
2.11.1-JCEP-Final-RR11, p56	A distant earthquake in Alaska or Japan could result in a tsunami with a relatively long lead-time (12 to 24 hours) before reaching the Oregon coast.	Provide a detailed tsunami hazard analyses, including distant tsunami hazards, prepared by a qualified professional for the proposed facilities and its surroundings. The results should be integrated into tsunami safety plans. DOGAMI estimates that an Eastern Aleutian generated tsunami is expected to arrive on the Oregon coast in 3 hours 40 minutes to about 4 hours (Allan et al 2018). Conversely, a Japanese tsunami is expected to arrive on the Oregon coast in as little as 9 hours 40 mins (Allan et al. 2012)
2.11.1-JCEP-Final-RR11, p56	All ships in Coos Bay, including an LNG carrier, would be directed to depart the harbor by the USCG COTP. LNG carriers at the LNG Terminal will be facing the basin entrance and Coos Bay and would be adequately manned, as required by the USCG, with the ability to get underway in a short time period while berthed. Therefore, the LNG carriers would be able to depart relatively quickly from the LNG Terminal and head out to sea in the event of a distant tsunami, in response to notice and instructions from the USCG COTP.	An evaluation of the time taken to mobilize a vessel and get underway should be described in more detail. Typical large vessel mobilization generally takes at minimum 30 minutes, though times closer to 1 hour are more common (Allan et al, 2018). Consideration should therefore be given to vessel mobilization time, and the time taken to

		transit along the navigation channel and offshore into deep water prior to the arrival of the tsunamis. For example, a vessel traveling at 12 knots along the 7 mile navigation channel from the JCEP site, will take ~30 minutes to reach the mouth of Coos Bay.
2.11.1-JCEP-Final-RR11, p56	It is established that it would take approximately 25 to 30 minutes for a large tsunami generated from the CSZ to reach Coos Bay after the earthquake event occurs.	Provide a detailed tsunami hazard analyses, including Cascadia tsunami arrival times, prepared by a qualified professional for the proposed facilities and its surroundings. DOGAMI's analyses indicate that the local tsunami arrives @ 24 minutes at the JCEP site. Maximum inundation occurs at 31 minutes.
2.11.1-JCEP-Final-RR11, p56	This amount of time would be adequate for the terminal to stop loading operations and disconnect from the LNG vessel and use two tug boats already in the slip to counteract the forces placed on the LNG carrier hull by the arriving tsunami.	Bear in mind that the region would be subject to 3-5 minutes of strong shaking, when normal operations would be severely challenged. Hence, this statement seems optimistic at best. Does the presence of the two tugs in the slip mean that these vessels would already be underway?

2.11.1-JCEP-Final-RR11.pdf, p56	If the LNG carrier is traversing the channel during the tsunami, the tugs would also provide assistance against the force of the tsunami wave coming up the channel as described above.	This statement seems optimistic at best. Recommend JCEP re-evaluates their vessel emergency response plan to a local tsunami.
2.13.1-JCEP-RR13-Public-1-of-7-1.pdf, p64	A uniform roughness was used for these simulations.	Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Please specify the roughness used.
2.13.3-JCEP-RR13-Public-3a-of-7-2.pdf, p7	To assess the effect of roughness, M&N simulated Scenario L1 with a composite roughness map where areas below 0.0 MSL (pre-event conditions) have a roughness defined by a Manning number of 0.0313 representing channel conditions and areas above 0.0 MSL (pre-event conditions) have a higher roughness defined by a Manning number of 0.05.	Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Please justify choice of roughness criterion (n=0.05) adopted for areas above 0.0 MSL, versus n=0.0313 used for the seabed.
2.13.3-JCEP-RR13-Public-3a-of-7-2.pdf, p15	According to a study published by the U.S. Geological Survey in 2008, there is a 10% probability that a CSZ earthquake of magnitude 8–9 will occur over the next 30 years (DOGAMI, 2012).	USGS (2012) estimated a full margin rupture at 7-12% next 50 years; 37-42% for southern Oregon. Goldfinger (2017) revised downward (i.e. more frequent) the recurrence of CSZ earthquakes for the central northern Oregon coast to ~340 years. He estimates that the conditional probability of a major event taking place is

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		16-22 % chance in the next 50 years.
2.13.3-JCEP-RR13-Public-3a-of-7-2.pdf, p29 to33	As it can be seen from the figures, the comparison shows a very good agreement between the two models for surface elevation and flow velocities of the leading wave as well as time of tsunami arrival at all stations.	We agree, though note that there are significant phase differences in the tsunami time series after the initial wave arrives. Please explain these discrepancies.
2.13.3-JCEP-RR13-Public-3a-of-7-2.pdf, p34	Based on the comparison of model results presented in Section 4.0 between M&N and DOGAMI, the simulation used uniform roughness defined by a Manning number of 0.0313 and uniform eddy viscosity defined by a Smagorinsky coefficient of 0.28	This is confusing. Do you mean another suite of modeling was performed where a uniform surface roughness was used that equaled 0.0313? Please clarify with respect to a previous comment noted above on surface roughness.
2.13.5-JCEP-RR13-Public-4-of-7.pdf, p10	According to a study published by the U.S. Geological Survey in 2008, there is a 10% probability that a CSZ earthquake of magnitude 8–9 will occur over the next 30 years (DOGAMI, 2012).	USGS (2012) estimated a full margin rupture at 7-12% next 50 years; 37-42% for southern Oregon. Goldfinger (2017) revised downward (i.e. more frequent) the recurrence of CSZ earthquakes for the central northern Oregon coast to ~340 years. He estimates that the conditional probability of a major event taking place is 16-22 % chance in the next 50 years.
DOGAMI memo dated	How the proposed facilities may negatively impact the tsunami hazards in the surrounding areas and safety of people;	This issue was raised in the DOGAMI November 6, 2017 review memo

November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.		(comment #3) and has still not been adequately addressed. What are the impacts to the surrounding area? What are the tsunami evacuation plans during construction? What are the tsunami evacuation plans during operations? What are negative impacts to the people in the surrounding area and revised evacuation plans for those areas?
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Tsunami scour in the nearby area and how the Maximum Considered Tsunami (MCT), that is, the design tsunami, may impact the local landforms, including the dunes, and proposed facilities and safety of people;	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #4) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove	Dynamic erosion of the North Spit dunes in response to the design tsunami and how it may impact tsunami runup at the proposed facilities and safety of people;	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #5) and has still not been adequately addressed.

LNG Terminal and Pacific Connector Gas Pipeline.		
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Tsunami debris impacting the nearby area and how it may impact the local landforms, including the dunes, proposed facilities and safety of people;	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #6) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Section 6.4.1.4 Tsunamis of the Resource Report 6 Jordan Cove Energy Project refers to the existing Trans Pacific Parkway/US- 101 Intersection as being in the tsunami inundation zone. The Applicant states, "To maintain grades, improvements to the intersection will not remove the intersection from the tsunami inundation zone." There appears to be only one access road for the proposed Jordan Cove LNG facility. This access road is in the tsunami inundation zone. In order for the access road to be reliably useable for safety purposes after a future tsunami disaster, it would need to incorporate both earthquake and tsunami resistant designs. These designs would need to factor in potential cyclic strain, liquefaction and lateral spreading from ground shaking. In addition, the designs would need to account for tsunami forces, including flooding, velocities, scour, buoyancy and debris impact. Has this roadway and access to the proposed facilities been evaluated for possible damage due to tsunami forces, such as tsunami scour and tsunami debris impact? Please provide analyses, results and, if needed, proposed mitigation that addresses both post-earthquake and post-tsunami safety for proposed berms, roadways and elevated ground. Related documents should be complete, clearly organized and	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #15) and has still not been adequately addressed.

	presented to allow for peer review by qualified specialists.	
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	The Applicant states (on page 8): ”The PCGP Project is located in relatively sheltered areas of Coos Bay, where the effects of a tsunami on the pipeline are expected to be relatively minor”. DOGAMI requests the tsunami analyses that supports this statement. What tsunami modeling was conducted for the proposed pipeline alignment? What are the tsunami flow depths used to estimate scour potential? Were tsunami scouring forces evaluated for both the incoming (inflow) and outgoing (outflow) tsunami waves?	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #18) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	The Applicant states (on page 46): ”As currently planned the portions of the pipeline that are crossing waterbodies that have the potential to be impacted by tsunami scour, will be installed using trenchless methods at depths well below the potential scour depths. Therefore, tsunami scour is not considered a hazard to the pipeline project.” The Applicant further states, “The modeling analysis showed that some temporary scour may occur in Coos Bay along the pipeline during inundation of the tsunami (approximately 1 to 2 hours).” The Applicant indicates that scour from tidal currents and river flows are approximately 3 feet at the pipeline crossing, and “it is recommended to use a 3-foot depth of scour resulting from tsunami impact”. DOGAMI requests the Applicant provide information on maximum potential scour depth from a Cascadia tsunami. Also, DOGAMI requests information on the minimum factor of safety the Applicant applied to address the maximum potential scour depth from Cascadia tsunamis along the proposed alignment in greater Coos Bay area.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #38) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017.	The Applicant, in general, found that their MIKE21 modeling matched the DOGAMI L1 first wave arrival (which reflects the largest wave), although wave amplitudes and phase differences were observed for later wave arrivals. No explanation is provided to	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #39) and has

DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	account for the latter differences. DOGAMI requests further discussion of differences in the modeling results after the initial wave arrival to account for phase and amplitude differences observed in the modeling results.	still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant provide peer reviewed documentation that describes the MIKE21 FM model and its ability to model tsunami inundation. Many issues are unclear, for example, does MIKE21 adequately account for the (vertical) wave runup on the wall and/or composite structure?	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #40) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant provide further explanation of the approach used to define the digital elevation model (DEM). In particular, how does the developed grid differ from the tsunami grids generated by NOAA's National Center for Environmental Information (NCEI). These data may be obtained here: https://www.ngdc.noaa.gov/mgg/inundation/tsunami/.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #41) and has still not been adequately addressed.

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DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant explain to what extent has the model been tuned to match the DOGAMI L1 scenario and inundation results.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #42) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant provide a better depiction of the three cases used to define the design crests. It is unclear whether the design reflects a berm, wall, or a composite structure around the perimeter of the entire complex, or portions of the complex. Please provide figures that characterize the proposed design.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #43) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal	DOGAMI requests that the Applicant explain why mean high water (MHW) was used as opposed to MHHW (as used by DOGAMI).	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #44) and has still not been adequately addressed.

and Pacific Connector Gas Pipeline.		
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Values of future sea level rise (SLR) presented by the Applicant are based on existing (historical) trends derived for the Charleston tide gauge. Based on its current rate, estimates were made out into the future (i.e. 30 years). This is an overly simplistic approach that assumes the past is the key to the future and hence discounts possible acceleration of SLR in the future. A more effective approach would be to base future estimates on the National Research Council (2012) SLR study that was completed for the US West Coast. National Research Council estimates account for expected local tectonic changes as well eustatic and steric responses and are a more reasonable (and current) estimates for the future. Please address SLR using current scientific data and methods.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #45) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Provide analysis of the potential role of sediment erosion of the North Spit dunes caused by the design tsunami. Research on the US East Coast suggests that sediment erosion during a tsunami may be significant and could impact inundation extents and runup (Tehranirad et al., 2015, 2016; Tehranirad, 2016). This notion is also supported by field studies following the March 11, 2011 Tohoku, Japan tsunami (Goto et al., 2012; Tanaka et al., 2012).	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #46) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological	Provide analyses of the potential role of tsunami wave reflection/focusing/defocusing as the tsunami impacts the proposed LNG facilities and its possible public safety implications for the surrounding Coos Bay environment. Tsunami waves that impact against proposed protective structures (e.g., berm, wall or composite structure) and the subsequent transfer of that energy to other areas within the bay is a public safety concern. DOGAMI requests additional modeling	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #47) and has still not been adequately addressed.

Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	for the purposes of addressing public safety. All documents should be complete, clearly organized and presented to allow for peer review by qualified specialists.	
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant provide analysis of maritime vessels and their potential to become ballistics within the bay be submitted to Oregon Department of Energy as part of the Emergency Response Plan. Maritime evacuation planning in response to the tsunami should be conducted and provided.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #48) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	DOGAMI requests that the Applicant provide analysis on the potential for off-site debris impacting the facilities and the potential ramifications with respect to public safety.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #49) and has still not been adequately addressed.
DOGAMI memo dated November 6, 2017.	DOGAMI requests that the Applicant provide information on each of the DEMs used for the tsunami model. For example, were three different DEMs used that reflect the three different case studies: berm, wall and composite structure? Please provide the DEMs.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #50) and has

DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.		still not been adequately addressed.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Elevated structures, including elevated berms, used for assembly areas in the tsunami inundation zone are subject to ASCE 7-16 chapter 6 requirements. The Applicant must design all elevated structures in the ASCE tsunami zone to be used as assembly areas in accordance with ASCE 7-16 chapter 6 to ensure public safety. Design documents should be complete, clearly organized and presented to allow for peer review by qualified specialists.	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #51) and has still not been adequately addressed.
PCGP RR6 App A.6 Part 1, section 4.5.3.2, page 30	The applicant states it used ODF guidelines and DOGAMI RML hazard zones.	Provide a detailed landslide hazard analyses prepared by a qualified professional using current state of practice methods that include lidar as a base map for the proposed facilities and its surroundings. Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Both the DOGAMI RML and ODF RML methods

		are for preliminary screening and/or used outdated data sources.
DEIS, p4-18	"Mass-movement of rapid-shallow landslides is typically triggered by large, infrequent storm events."	"infrequent" is a relative term. Define and reference this conclusion. There is data in SLIDO which confirms shallow landslides in the Tyee occurring within basins on the 5-10 year time frame.
DEIS, p 4-18	"These features can usually be identified on topographic maps or aerial photos based on distinctive contour or vegetative patterns."	Lidar has been concluded to be the only definitive method for finding deep slides in western Oregon. Restate the sentence or provide modern reference to support this conclusion or complete mapping using lidar along the entire length of the route. Burns, W. J., 2007, Comparison of remote sensing datasets for the establishment of a landslide mapping protocol in Oregon. AEG Special Publication 23: Vail, Colo., Conference Presentations, 1st North American Landslide Conference.
DEIS, p 4-19	"Shallow-rapid landslides are unlikely to induce long-term strain to a pipeline, but rather more likely to expose the pipe and result in a loss of support where it crosses a debris slide source area."	This is completely site dependent. If the pipe is at the surface, a shallow slide could run

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		into the pipe. Define the situations where this occurs.
DEIS p 4-19	"The purpose of the first phase study was to identify existing landslides as well as areas susceptible to landslides within one-quarter mile of the initial alignment by reviewing published maps and digital data (Burns et al. 2011a, 2011b), aerial photographs and LiDAR-generated hillshade models. The purpose of following two phases was to further evaluate only those landslide hazard sites that represent potentially moderate or high risk to the pipeline, based on the results of the previous phase of evaluation."	SLIDO is a compilation of published data and ranges from very poor older data from decades ago to the best available modern lidar based data. We don't recommend using it to make decisions about where to look further and in more detail. Site specific evaluations should be completed using lidar data in order to complete phase 1 correctly and completely.
DEIS p 4-20	"The intent was to identify areas that have some potential to be affected by RMLs so that they would be considered and evaluated appropriately."	Potential Rapidly Moving Landslide Hazards in Western Oregon (Hofmeister et al. 2002) is a preliminary screening tool and based on outdated datasets. Site specific evaluations including modern methods should be completed using lidar data in order to evaluate areas that have potential for shallow landslides.
DEIS p 4-20	"Based on available topographic mapping, no slopes along the pipeline alignment east of MP 166 exceed 65 percent or appear to be at high risk of rapidly moving landslide occurrence."	Conclusions should be supported by modern references. Site specific evaluations should be completed using lidar data to evaluate areas

		that have potential for shallow landslides.
DEIS p 4-20	"Using LiDAR where available, 10-meter digital elevation model, and aerial photography, Pacific Connector identified moderate and high risk RML sites along the proposed route."	Site specific evaluations should be completed using lidar data to evaluate areas that have potential for shallow landslides.
DEIS p 4-20	"Larger, deep-seated landslides can usually be identified from topographic maps (including LiDAR) and aerial photographs."	Lidar has been concluded to be the only definitive method for finding deep slides in western Oregon. Site specific evaluations should be completed using lidar data to evaluate areas that have potential for shallow landslides. Burns, W. J., 2007, Comparison of remote sensing datasets for the establishment of a landslide mapping protocol in Oregon. AEG Special Publication 23: Vail, Colo., Conference Presentations, 1st North American Landslide Conference.
DEIS p 4-21	"the Klamath Falls region (with relatively recent events of magnitudes 5.9 and 6.0) and the Coos Bay region (with the potential for very large, long recurrence interval, Cascadia megathrust events)."	USGS Cascadia ground motion maps predict the effects of a Cascadia will be much further inland that just the Coos Bay region. The entire pipeline route is in a high seismic zone. Revise the sentence to reflect current science on earthquake hazards.

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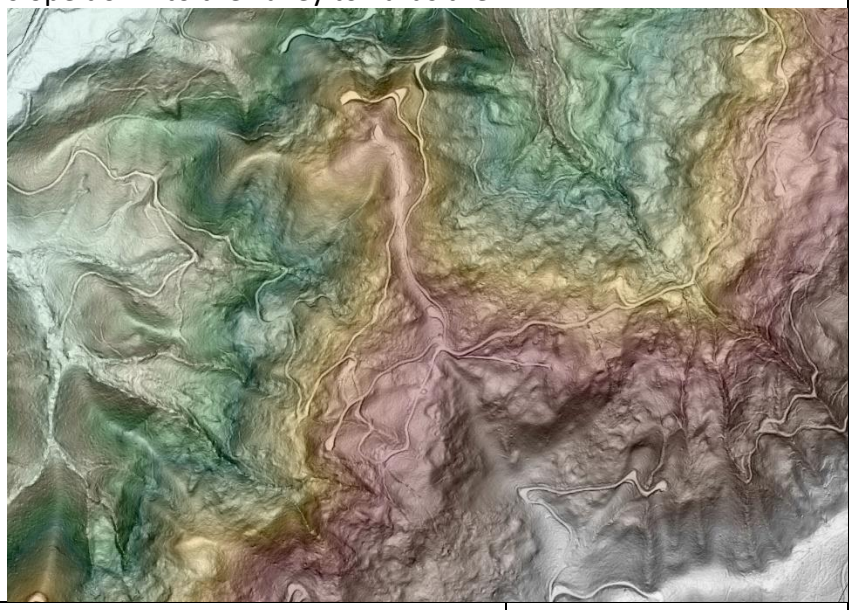
DEIS p 4-21	"Six landslides were identified as posing a moderate to high potential risk and were evaluated further in the field."	This number of landslides is very low compared to what has been recently mapped in areas just north of the pipeline route using lidar based mapping. Lidar has been concluded to be the only definitive method for finding deep slides in western Oregon. We recommend the applicant use lidar data to map the landslides. Burns, W.J., Duplantis, S., Jones, C.B., and English, J.T., 2012. Lidar data and Landslide Inventory Maps of the North Fork Siuslaw River and Big Elk Creek Watersheds, Lane, Lincoln, and Benton Counties: Oregon Department of Geology and Mineral Industries, Open-File Report O-12-07. http://www.oregongeology.org/pubs/ofr/p-O-12-07.htm Burns, W.J., Herinckx, H.H., and Lindsey, K.O., 2017. Landslide inventory of portions of northwest Douglas County, Oregon, Oregon Department of Geology and Mineral Industries, Open-File Report O-17-04. Esri geodatabase with

			internal metadata, external metadata in .xml format, 4 map plates (in both print and onscreen resolutions), scale 1:20,000. http://www.oregongeology.org/pubs/ofr/p-O-17-04.htm
DEIS p 4-21	"Ridgetops are generally considered to be stable"		Provide a modern reference for this statement. Recent mapping in the coast range has found landslides propagating to and over the ridges. See references in above comment.
DEIS p 4-22	"All of the moderate- and high-hazard deep-seated landslides identified along the alignment were avoided"	If lidar and site-specific landslide hazard mapping was not performed to locate these areas, there are likely many areas missed and therefore not "all" are identified or avoided. An example can be seen in the following lidar image of the route from MP89-90. The PCGP mapping in Appendix F identified one landslide on the NE side of the route ridge. However, as a qualified professional can see in the lidar image, landslides are located along both sides of the ridge and on the	

		slope down to the valley towards the NW. 
DEIS p 4-22	"All known hazardous landslides thought to pose a risk to the pipeline have been avoided through routing."	If lidar and site-specific landslide hazard mapping was not performed to locate the hazardous areas, there are likely many hazards missed and therefore not "all" have been identified or avoided.
DEIS p-4-22	"Following Pacific Connector's proposed BMPs described in the ECRP would limit potential adverse impacts on slope stability for those side slopes segments that are less than 30 percent gradient. In general, these BMPs include using well-drained structural fill placed in lifts and compacted for the side slope sites with gradients of 30 percent or greater oriented perpendicular to the pipeline."	Using slope gradient alone does not work in areas of existing landslides. Many deep landslides are on slopes with very low gradients. A critical component is identifying where the existing landslides and hazards are located and addressing each one individually regardless of slope gradient. Even small amounts of grading on existing landslides can cause significant problems.
DEIS p 4-23	"Monitoring higher-risk areas along the pipeline can aid in detecting landslide occurrence and movement so	This method only applies to very limited

	that action can be taken to prevent damage to the pipeline."	group of types of landslides and triggering types. For example, during a future Cascadia earthquake, it will be very difficult to monitor, detect movement and take action before the co-seismic landslides have already moved and damaged the pipeline.
DEIS p 4-24	"Although the pipeline route does not cross active or recently active landslides, if any landslides do occur or become reactivated after the pipeline is installed, Pacific Connector would monitor the slide movement so that mitigation can be identified and implemented prior to damage occurring to the pipeline."	This unsubstantiated conclusion needs analyses and data to support it. For example, collecting lidar for the entire route and mapping all the existing landslides and evaluating them.
PCGP RR6 App A.6 part 1, page 28	"Some of the Pipeline route adjustments intended to avoid identified hazards, as well as land acquisition issues, resulted in route alignments that extended outside the area of LiDAR coverage. Supplemental LiDAR and aerial photograph data were acquired for many of these localized reroute areas. Nevertheless, some of the later reroute alignments are currently outside the area of LiDAR and aerial photograph coverage."	DOGAMI recommends the Applicant obtain high resolution lidar for all areas that may impact the proposed facilities or pipeline along the proposed route. Lidar coverage should be collected with enough buffer distance to characterize potential seismic and landslide hazards. For example, for landslide hazards, the lidar should include from the valley bottom to the top of the ridge. Also, there is publicly available lidar data along most all of the pipeline route as well as statewide aerial

		photography. Please evaluate the potential large landslides keeping in mind that landslides may extend from the tops of ridges and may move downslope to block rivers. In addition, lidar should be used to evaluate seismic sources. The issue of inadequate landslide hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comment #35) and has still not been adequately addressed.
PCGP RR6-AppA.6-part 1, p28	"However, most landslides can be placed in two general categories: (1) shallow-rapid landslides (debris slides/flows); and (2) deep-seated landslides."	Provide a comprehensive, detailed landslide hazard analyses prepared by a qualified professional for the proposed facilities and its surroundings. Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Co-seismic lateral spreads are an important type of landslide which could affect the facility and pipeline.
PCGP RR6-AppA.6-part 1, p29	"generally greater than 50 percent"	Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner. Provide

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		references for all numbers.
PCGP RR6-AppA.6-part 1, p29	"DOGAMI, in cooperation with other agencies, produced a map of Potential Rapidly Moving Landslide Hazards in Western Oregon (Hofmeister et al., 2002)."	This map is considered for preliminary screening and was created before lidar data became widely available. Site-specific evaluation of RML should be performed by the consultants using lidar data and modern methods. The issue of inadequate landslide hazard analysis was raised in the DOGAMI November 6, 2017 review memo (comment #37) and has still not been adequately addressed.
PCGP RR6-AppA.6-part 1, p30	"The source, transport and depositional zones comprising the RML hazard areas were not differentiated on the maps/GIS data provided by DOGAMI."	This map (DOGAMI IMS-22) is considered for preliminary screening and was created before lidar data became widely available. It is also not intended to make site-specific decisions. In this example, the IMS-22 data appears to be further misused to make non-site-specific evaluations. Site-specific evaluation of RML should be performed by the consultants using lidar data and modern methods. The issue of inadequate landslide hazard analysis was raised in the DOGAMI November 6, 2017

		review memo (comment #36) and has still not been adequately addressed.
PCGP RR6-AppA.6-part 1, p31	"The initial relative risk to the Pipeline posed by the source, transport and depositional zones are considered to be high, moderate and low, respectively."	Provide a reference or documentation for this unsubstantiated conclusion. Debris flow depositional areas can be extremely dangerous and impactful depending on the size of the event. Concluding the risk is "low" for these areas needs substantial support from referenceable scientific studies.
PCGP RR6-AppA.6-part 1, p32	The greatest potential for reactivating large, deep-seated landslide movement is from human activity, seismic activity, stream erosion, and/or above-normal precipitation that extends over several months or years.	Provide a reference or documentation for this unsubstantiated conclusion.
PCGP RR6-AppA.6-part 1, p32	"The Pipeline is located within 1,000 feet and is upslope or downslope of the landslide"	Provide a reference or documentation for the unsubstantiated conclusion that 1,000 ft is far enough up or downslope to examine. Landslides should be evaluated to the extent for which they could impact the pipeline.
PCGP RR6-AppA.6-part 1, p33	"Surficial, geomorphic and vegetative features suggest that the landslide is active or dormant-historic (past movement less than 100 years ago) (Keaton and Degraff, 1996)."	Landslide age should not be used to determine hazard or risk.
PCGP RR6-AppA.6-part 1, p33	"Alignment is at a proximity that is sufficiently far from the landslide"	Provide a reference or documentation for the unsubstantiated conclusion that "sufficiently far" is far

		enough for the pipeline to be safe.
PCGP RR6-AppA.6-part 1, p34	During this phase, routing specialists were consulted to identify potential alternative routes around moderate to high risk landslides that appeared to be active or to have the potential to reactivate.	Analysis of risk should be quantitative using acceptable state-of-practice methods. For example, “landslides that appeared to be active or have potential to reactivate” is very vague and not conclusive.
PCGP RR6-AppA.6-part 1, p34	4.6. Landslide Hazard Avoidance and Minimization of Adverse Effects	If lidar and site-specific landslide hazard mapping was not performed to locate these areas, there are likely many areas missed and therefore not “all” are identified or avoided.
PCGP RR6-AppA.6-part 1, p35	“To ensure long term stability, it is important that fill slopes constructed at gradients of 30 percent or greater be engineered.”	A simple slope gradient is not sufficient to identify where engineered cuts and fills should be performed. For example, many deep landslides have slopes much less than 30 percent.
PCGP RR6-AppA.6-part 1, p35	“Perforated drains should be surrounded by 12 inches of drain rock and all of which wrapped in a geotextile filter fabric.”	If water is being collected at the surface or subsurface, a plan for where the water will be discharged is critical. Provide a water plan including collection and discharge. Discharging water in a non-designed method can cause slope instability. Using lidar to map all

		the existing landslides along the entire length of the pipeline route on both sides of the route all the way to the ridge top or all the way to the valley bottom is the only way to ensure discharging of water will not increase slope instability.
PCGP RR6-AppA.6-part 1, p35	4.6.2.1. SURFACE AND NEAR SURFACE WATER MANAGEMENT	If water is being collected at the surface or subsurface, a plan for where the water will be discharged is critical. Provide a water plan including collection and discharge. Discharging water in a non-designed method can cause slope instability. Using lidar to map all the existing landslides along the entire length of the pipeline route on both sides of the route all the way to the ridge top or all the way to the valley bottom is the acceptable way to help ensure discharging of water will not increase slope instability.
PCGP RR6-AppA.6-part 1, p37	“During Pipeline construction, qualified professionals with experience in slope stability will observe Pipeline construction within the identified landslides. If indications of instability are observed, necessary mitigative actions will be taken.”	Pre-construction, construction, and post-construction stability analysis should be performed before the project is started so that potential adverse effects can be identified and

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		mitigation prior to construction.
PCGP RR6-AppA.6-part 1, p37	The proposed PCGP Pipeline does not cross known active or recently active landslides that require installation of instrumentation. The ancient landslides crossed by the proposed PCGP Pipeline alignment will be monitored as part of the system-wide monitoring conducted by PCGP.	If lidar and site-specific landslide hazard mapping was not performed to locate these areas, there are likely many areas missed and therefore not "all" hazards have been identified nor avoided. Provide a detailed landslide hazard analyses prepared by a qualified professional using current state of practice methods that include lidar as a base map for the proposed facilities and its surroundings. Document the analyses, data, assumptions, results, proposed mitigations, and any issues in a clear manner.
DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	Dependencies on existing infrastructure, such as roads and levees, which may fail during disasters causing safety concerns;	This issue was raised in the DOGAMI November 6, 2017 review memo (comment #7) and has still not been adequately addressed.

DOGAMI memo dated November 6, 2017. DOGAMI Comments Related to Geological Hazards and the Proposed Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline.	On the basis of Oregon Administrative Rules per Division 21, OAR 345-021-0010(1)(h)(F)(i-ii), which states: "(i) An explanation of how the applicant will design, engineer, construct and operate the facility to integrate disaster resilience design to ensure recovery of operations after major disasters. (ii) An assessment of future climate conditions for the expected life span of the proposed facility and the potential impacts of those conditions on the proposed facility" (Accessed from: https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=234447), DOGAMI encourages designing and building for ***disaster resilience*** and ***future climate*** using science, data and community wisdom to protect against and adapt to risks. This will allow people, communities and systems to be better prepared to withstand catastrophic events and future climate—both natural and human-caused—and be able to bounce back more quickly and emerge stronger from shocks and stresses. This includes: • Using best practices supporting public safety • Using a long-term view to protect citizens, property, environment, and our standard of living • Integrating resilience, where possible, by avoiding high risk areas or embracing higher performance standards than may be required by building codes and regulations. This will lessen damage and speed recovery after disasters and improve continuity of operations.	This issue was raised in the DOGAMI November 6, 2017 review memo and has not been adequately addressed.

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July 22, 2019

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: *Pacific Connector Gas Pipeline, LP* and *Jordan Cove Energy Project L.P.*
Docket Nos. CP17-494-000 and CP17-495-000
Response to Comments on Draft Environmental Impact Statement

Dear Ms. Bose:

On September 21, 2017, Jordan Cove Energy Project L.P. ("JCEP") filed an application pursuant to Section 3(a) of the Natural Gas Act, as amended,[1] and Parts 153 and 380 of the regulations of the Federal Energy Regulatory Commission ("Commission"),[2] for authorization to site, construct, and operate certain liquefied natural gas facilities ("LNG Terminal"). On the same day, Pacific Connector Gas Pipeline, LP ("PCGP", and together with JCEP, "Applicants") filed an application pursuant to Section 7(c) of the NGA,[3] and Parts 157 and 284 of the Commission's regulations,[4] for a certificate of public convenience and necessity authorizing PCGP to construct, install, own, and operate a new natural gas pipeline ("Pipeline"). On March 29, 2019, the Commission Staff issued its Draft Environmental Impact Statement ("DEIS") for the Project, establishing a deadline for comments on the DEIS of July 5, 2019.

Applicants hereby submit in Attachment A their response to certain of the comments regarding the DEIS that have been filed in the above-referenced dockets. Applicants are submitting this response to assist the Commission in its review of all comments filed during the DEIS comment period as part of the preparation of the Final Environmental Impact Statement.

[1] 15 U.S.C. § 717b(a) (2012).
[2] 18 C.F.R. Pts. 153 and 380 (2018).
[3] 15 U.S.C. § 717f.
[4] 18 C.F.R. Pts. 157 and 284.

Should you have any questions, please contact me at neades@pembina.com or 832-255-3841.

Sincerely,

/s/ Natalie Eades
Natalie Eades
Jordan Cove Energy Project L.P.
Pacific Connector Gas Pipeline, LP

Enclosures

cc: John Peconom (FERC)
John Crookston (Tetra Tech)

CERTIFICATE OF SERVICE

I hereby certify that I have this 22nd day of July, 2019, served the foregoing document upon each person designated on the official service lists compiled by the Secretary in these proceedings.

/s/ Victoria R. Galvez
Victoria R. Galvez
Attorney for
Jordan Cove Energy Project L.P.
Pacific Connector Gas Pipeline, LP

Attachment A

Response to Comments on DEIS

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I. *Introduction*

Jordan Cove Energy Project L.P. ("JCEP") and Pacific Connector Gas Pipeline, LP ("PCGP", and collectively, "Applicants") are seeking authorizations from the Federal Energy Regulatory Commission ("FERC" or "Commission") pursuant to Sections 3 and 7(c) of the Natural Gas Act ("NGA") for JCEP's proposed liquefied natural gas ("LNG") export terminal ("LNG Terminal") and PCGP's associated pipeline ("Pipeline"). The LNG Terminal and Pipeline are referred to, collectively, as the "Project."

On March 29, 2019, Commission Staff issued the draft Environmental Impact Statement ("DEIS") for the Project and provided a Notice of Availability of the DEIS for the Project ("Notice"). In its Notice, Commission Staff established a comment period through 5:00 p.m. Eastern time on July 5, 2019. The Applicants respectfully submit herewith their response to the comments that have been submitted on the DEIS. Applicants have already addressed many environmental issues during the National Environmental Policy Act ("NEPA")[5] review of the Project in the prefiling docket, Docket No. PF17-4-000, and in the certificate proceeding dockets, Docket Nos. CP17-494-000 and CP17-495-000. Accordingly, Applicants only address comments received on the DEIS for which Applicants have new or additional information to add to the record to assist the Commission in its NEPA review.

For comments submitted, through the close of business on July 5, 2019, Applicants tracked each commenter's name, the date of filing, and a summary of each stakeholder's comment(s).[6] Each comment was also reviewed to determine which subject matter category(ies) it pertained.[7] Each comment summary was then organized in separate files by category to be compared and grouped with other similar comments. These groupings were further classified into subcategories within each of the subject matter categories. The comment summaries in each category and subcategory were consolidated into summary topics that were designed to address each stakeholder comment.

[5] 42 U.S.C. §§ 4321 *et seq*.

[6] Applicants note that comments continued to be submitted following the close of the comment period. Additionally, certain of the comments submitted are technical in nature and will require further expert review. Applicants will provide supplemental responses to these late-filed and technical comments if necessary.

[7] The subject matter categories are as follows: NEPA Process; NGA Review; Forest Service and BLM; Geologic Resources; Soils and Sediments; Water Resources and Wetlands; Upland Vegetation; Wildlife and Aquatic Resources; Threatened, Endangered, and Other Special Status Species; Land Use; Recreation and Visual Resources; Socioeconomics; Transportation; Cultural Resources; Air Quality and Noise; Reliability and Safety; and Engineering and Construction.

II. *NEPA Comments*

A. Sufficiency of the DEIS and FERC's NEPA Process

1. An Extension of the Comment Period is Neither Required Nor Necessary

Commenters argue that, given the length of the DEIS, the Commission should extend the comment period.[8] As Applicants have previously noted,[9] these arguments fail to justify a departure from the Commission's consistent practice regarding the time allocated for comment on a DEIS, which the Commission followed for this Project.[10] Here, the Commission provided for a nearly 100-day comment period, well in excess of the minimum 45-day period specified in the Council on Environmental Quality's ("CEQ") regulations, and even in excess of the 90-day review period required for U.S. Bureau of Land Management ("BLM") and U.S. Forest Service ("USFS") plan amendments.[11] Moreover, such an extension is not necessary in these circumstances. The submission of multiple detailed and substantial comments by various groups demonstrates that the original comment period was sufficient for the public to provide comments.[12] The nearly 100-day comment period used for the Project's DEIS is consistent with public review and comment periods established pursuant to NEPA, Federal Land Policy and Management Act ("FLPMA"), and National Forest Management Act ("NFMA"), and exceeds the comment periods of other recent LNG projects.[13]

Notwithstanding comments to the contrary,[14] Applicants have also taken extensive measures to ensure that copies of the DEIS are available for public review. Applicants have arranged for complete paper copies of the DEIS (narrative plus attachments) to be available at public libraries and have arranged for copies of the narrative text of the DEIS, without appendices, to be available at certain federal agencies' offices in Coos, Douglas, Jackson, and Klamath

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[8] *See* Request for Extension of Comment Period for DEIS of Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians, Accession No. 20190510-5051 at p. 1 (May 10, 2019) ("CTCLUSI Request for Extension"); Comments of Clarence L. and Stephany D. Adams, Accession No. 20190703-5053 at p. 1 (July 3, 2019) ("Clarence Adams Comments").

[9] DEIS Comment Period Letter of Jordan Cove Energy Project L.P. and Pacific Connector Gas Pipeline, LP, *et al.*, Accession No. 20190417-5104 at pp. 1-2 (Apr. 17, 2019).

[10] *E.g.*, Notice of Availability of the Draft Environmental Impact Statement for the Proposed Southeast Market Pipelines Project, Accession No. 20150904-3011 at p. 3 (Sept. 4, 2015); Notice of Availability of the Draft Environmental Impact Statement for the Proposed Rover Pipeline, Accession No. 20160219-3013 at p. 2 (Feb. 19, 2016); Notice of Availability of the Draft Environmental Impact Statement for the Proposed Nexus Gas Transmission Project and Texas Eastern Appalachian Lease Project, Accession No. 20160708-3008 at p. 3 (July 8, 2016).

[11] 40 C.F.R. § 1506.10(c) (2016); 36 C.F.R. § 219.16(a)(2); 43 C.F.R. § 1610.2(e).

[12] *See, e.g.*, Motion to Intervene and Comments of the Natural Resources Defense Council, Accession No. 20190705-5164 (July 5, 2019) ("NRDC Comments"); Comments of Western Environmental Law Center, *et al.*, Accession No. 20190703-5020 (July 3, 2019) ("WELC Comments").; Comments of the Confederated Tribes of the Grand Ronde Community of Oregon, Accession No. 20190703-5105 at p. 12 (July 3, 2019) ("Grand Ronde Comments") .

[13] Recent comment periods for LNG Projects ranged from 52 to 55 days, and even those comment periods that were extended due to the government shutdown only ranged from 89 to 102 days. *See, e.g.*, Comment Period for the Annova LNG Project, Docket No. CP16-480 (52 days, and extended to 89 days); Comment Period for the Eagle LNG Project, Docket No. CP17-41 (52 days, and extended to 101 days); Comment Period for Venture Global Plaquemines LNG Project, Docket No. CP17-66 (52 days).

[14] Comments of John Clarke, Accession No. 20190507-5061 at p. 2 (May 7, 2019) ("John Clarke Comments"); Clarence Adams Comments at p. 1.

Counties.[15] In sum, commenters had sufficient time to meaningfully review and comment on the DEIS.

2. A Programmatic EIS is Not Required

Some commenters suggested that FERC should issue a programmatic EIS to analyze all LNG export terminals throughout the United States or to analyze all fossil fuel projects.[16] A programmatic EIS is not required in this situation. A programmatic EIS is necessary where there is a proposed "overall plan for . . . development[.]"[17] The CEQ regulations provide that such programmatic reviews may be appropriate where an agency is adopting official policy, adopting a formal plan or agency program, or proceeding with multiple projects that are temporally and spatially connected.[18] Neither the Commission nor any of the other cooperating federal agencies have a plan, policy, or program for the overall development of natural gas infrastructure.[19] Rather than engaging in regional planning, the agencies are acting in response to individual applications filed by private entities. The mere fact that there are several planned, proposed, or approved infrastructure projects involving the transportation of natural gas does not establish that the Commission or any other cooperating federal agency is engaged in a broader plan or development effort. Reviewing courts in other cases challenging FERC projects have consistently rejected arguments that a programmatic EIS is required.[20]

Moreover, the Supreme Court has held that the determination of whether to prepare a programmatic EIS "requires a high level of technical expertise and is properly left to the informed discretion of the responsible federal agencies."[21] Guidance from the CEQ confirms that agencies have "discretion to determine whether a programmatic approach is appropriate."[22]

There is no overall federal plan for development of natural gas pipeline projects or for LNG export terminals. A programmatic EIS is not required and would not be appropriate for this Project.

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[15] Supplemental Information Filing of Pacific Connector Gas Pipeline, LP, *et al.*, Accession No. 20190416-5186 at p. 1 (Apr. 16, 2019).

[16] Comments of Ronald Crete, Accession No. 20190701-5065 at p. 3 (July 1, 2019) ("Ronald Crete Comments"); NRDC Comments at pp. 58-59.

[17] *See Kleppe v, Sierra Club*, 427 U.S. 390, 402 (1976).

[18] Memorandum from CEQ to Heads of Federal Departments and Agencies, Effective Use of Programmatic NEPA Reviews 13-15 (Dec. 24, 2014).

[19] *See, e.g., National Fuel Gas Supply Corp.*, 154 FERC ¶ 61,180, at P 13 (2016); *Texas Eastern Transmission, LP*, 149 FERC ¶ 61,259, at P 38-47 (2014); *Columbia Gas Transmission, LLC*, 149 FERC ¶ 61,255 at P 119 (2014).

[20] *See, e.g. Sierra Club v. FERC*, 827 F.3d 36, 50 (D.C. Cir. 2016) ("*Freeport I*") (rejecting a claim that NEPA requires the Commission to undertake a nationwide analysis of all applications for liquified natural gas export facilities); *Myersville Citizens for a Rural Cmty., Inc. v. FERC*, 783 F.3d 1301, 1326-27 (D.C. Cir. 2015) (upholding FERC's determination that a pipeline project's excess capacity that could be used to move gas to an LNG export terminal was "unrelated" to the LNG export terminal project).

[21] *Kleppe*, 427 U.S. at 412.

[22] Council on Environmental Quality, Final Guidance for Effective Use of Programmatic NEPA Reviews, 79 Fed. Reg. 76986, 76987 (Dec. 23, 2014).

3. *Incomplete Data or Plans do not Render the DEIS Deficient or Require a Revised or Supplemental DEIS; the DEIS is Not Deficient for Not Including Every Detail of the Commission's Analysis*

Several commenters assert that missing or incomplete data render the DEIS inadequate under NEPA.[23] Contrary to commenters' suggestions, NEPA does not require that the Commission halt progress on a pending application due to incomplete information. Rather, CEQ regulations address the possibility of incomplete or unavailable information, and provide that the review be done based on the information that is available at the time, including "the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community."[24] If information that is relevant to the NEPA review is not available, the Commission is simply required to document the reasons for the missing information, its importance, and a summary and evaluation of the information that is currently available from alternate sources.[25] The DEIS succinctly provides such documentation where necessary.[26] The unavailability of such information does not render the Commission's NEPA analysis incomplete.

Commenters also allege that the DEIS's description of the Commission's analysis of various issues, such as wetlands impacts, is insufficient due to unavailable information.[27] However, the Commission is not required to provide every detail of its analysis. The DEIS indicates that multiple criteria, ranging from water quality to wildlife and habitat value to recreation and educational value, were considered.[28] Agencies have substantial discretion when determining the extent of their inquiry and the appropriate level of explanation.[29] Therefore, the decision to not provide further detail on the Commission's analysis of certain parts of the DEIS, such as wetland impacts, does not render the Commission's NEPA analysis incomplete.[30]

Some commenters also argue that the lack of complete and finalized plans, such as the draft fish salvage plan, at the time the DEIS was issued denies the public and agencies a sufficient opportunity to comment on the information.[31] These claims are contrary to NEPA's requirements

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[23] *See, e.g.*, Comments of the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians, Accession No. 20190708-5040 at p. 2 (July 8, 2019) ("CTCLUSI Comments") (out of time); Comments of Cow Creek Band of Umpqua Tribe of Indians, Accession No. 20190703-5108 at pp. 2-3 (July 3, 2019) ("Cow Creek July 3 Comments").

[24] 40 C.F.R. § 1502.22 requires that agencies facing this situation include in the EIS "(1) A statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community."

[25] *See id.*

[26] *See, e.g.*, DEIS at pp. 4-794 to 4-795 (discussing lack of availability of certain information on the Port's Channel Modification Project, the relative contribution of that project to cumulative impacts, and a discussion of impacts based on available information).

[27] *See, e.g.*, Cow Creek July 3 Comments at pp. 4-5.

[28] DEIS at p. 4-128.

[29] *Marsh v. Oregon Natural Resource Council*, 490 U.S. 360, 376-77 (1989).

[30] With respect to wetlands specifically, the project will obtain permits from both the U.S. Army Corps of Engineers and the Oregon Department of State Lands for impacts to wetlands. FERC's NEPA document may assume compliance with these other permitting requirements and defer to the expertise of the agencies that regulate these impacts. See Section II.A.5 below.

[31] *See, e.g.*, Cow Creek July 3 Comments at pp. 2-3.

because, as the Supreme Court has explained, a DEIS should "provide[] a springboard for public comment" and offer "notice of the expected consequences and the opportunity to plan and implement corrective measures in a timely manner."[32] There is little question that this DEIS provided such notice as well as an opportunity to develop and implement mitigation measures. Indeed, the D.C. Circuit has rejected similar arguments to the one raised by commenters here, and determined that a lack of site-specific crossing plans did not render a DEIS incomplete.[33] Because the descriptions contained in the DEIS in that case were sufficient to engender public comment, this DEIS similarly meets NEPA requirements.

4. The Data Relied Upon is Scientifically Sound

NEPA requires agencies to engage in "accurate scientific analysis" to "help public officials make decisions that are based on understanding of environmental consequences."[34] As such, agencies must "insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements."[35] Some commenters suggest that certain data supporting the Commission's analyses are unreliable simply because of the data's age.[36] Although collected at various points over the course of the Project's development, the data supporting the analyses in the DEIS are scientifically reliable and the Commission and cooperating agencies are justified in relying upon it. There is no requirement under NEPA that data of a certain age be disqualified, provided the data is still accurate. For example, geologic data could be decades or even centuries old, and still be accurate because the data does not change. Other data may need to be updated more frequently—*e.g.*, the conditions of certain habitat and the presence of certain species—if conditions change. If commenters believe certain data may no longer be accurate and provide substantive reasons why, the federal agencies have a duty to respond to such comments.[37] But data and studies are not invalid simply because of their age. So long as data are scientifically sound, and there is no evidence of a change in circumstances that would affect the data, courts do not disturb an agency's reliance on scientific evidence.[38]

5. Reliance on Other Agency Expertise

A number of commenters incorrectly allege that a NEPA document must include all information that is necessary to obtain the numerous permits required by a federal action and/or fulfill other non-NEPA related obligations related to the Project. Many of these comments relate

[32] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349-50 (1989).
[33] *National Committee for the New River v. FERC*, 373 F.3d 1323, 1327–28 (D.C. Cir. 2004).
[34] 40 C.F.R. § 1500.1.
[35] 40 C.F.R. § 1502.24.
[36] Comments of David and Emily McGriff, Accession No. 20190515-5027 at p. 1 (May 15, 2019); Comments of Sandy Egleston, Accession No. 20190625-0028 at p. 1 (June 25, 2019) ("Sandy Egleston Comments").
[37] *See* 40 C.F.R. § 1504(a).
[38] *New River Valley Greens v. United States Dept. of Transp.*, Case No. 96-2545, 1997 WL 712887, at *3 (4th Cir. Nov. 17, 1997) (finding agency's reliance on five to ten year old data was not arbitrary or capricious because there was no evidence that the underlying circumstances had "changed so drastically . . . as to render the data inherently unreliable or archaic."); *see League of Wilderness Defs. v. Connaughton*, 752 F.3d 755, 763 (9th Cir. 2014) (finding plaintiffs were unlikely to succeed on the merits where they did not present reliable evidence that the data the agency relied upon was incorrect or that circumstances had changed).

to safety regulations and regulatory assessments by agencies other than the Commission and cooperating agencies.

First, some commenters expressed concern for a perceived lack of safety regulations implemented by the United States Coast Guard ("USCG") and for the lack of enforcement of those safety regulations. They argue that USCG suffers from regulatory capture because it bases its decisions on information that is provided only from those with a financial interest in the Project. They recommend that USCG mandate safe distances from all LNG facilities and ships to ensure public safety.[39] Other commenters lament the lack of discussion of actual USCG authority and policies as they relate to safety risks and failure to discuss the issues identified in the Water Suitability Analysis/Letter Of Recommendation ("LOR") process.[40]

As an initial matter, these comments are well outside the scope of the DEIS, which does not address issues relating to the alleged inadequacy of the Commission's or any cooperating agency's regulations. Further, the LOR is not a decision or regulatory document, but serves as the USCG's input into the Commission's NEPA process and review of the Project.[41]

In any event, under NEPA, the Commission (and each cooperating federal agency) is obligated to conduct an independent evaluation of the environmental impacts and effects of a proposed federal action—in this case, the Project.[42] While the lead agency may not abdicate its responsibility under NEPA by wholly relying on another agency's examination of environmental effects, here the Commission may rely on the conclusions of other agencies in conducting its own independent assessment.[43] Further, the Commission can rely on future coordination between an applicant and other regulators in its NEPA assessment.[44] The Commission has adequately considered the related impacts in the DEIS and is not required to do more.

Some commenters note that the Commission should have analyzed the possibility of an intentional attack on the LNG facility.[45] The DEIS acknowledges the Project's security risks, including those associated with an intentional attack, and notes that the USCG and Department of

[39] Comments of Wim G de Vriend, Accession No. 20190419-5008 at pp. 7-9 (Apr. 19, 2019) ("Wim de Vriend Comments").
[40] WELC Comments at pp. 27-28.
[41] *Id.* at pp. 27-28.
[42] *Steamboaters v. FERC*, 759 F.2d 1382, 1393–94 (9th Cir. 1985).
[43] *Sierra Club v. Clinton*, 746 F. Supp. 2d 1025, 1038 (D. Minn. 2010) (agency utilizing another agency's assessment of particular impacts as support for its independent NEPA assessment).
[44] *Township of Bordentown, New Jersey v. Fed. Energy Regulatory Comm'n*, 903 F.3d 234, 246-47, 254–56 (3d Cir. 2018) ("FERC . . . concluded reasonably that any impacts would be mitigated by the responsible state agency overseeing the permitting process for [a nearby non-jurisdictional pipeline]."); *EarthReports, Inc. v. Fed. Energy Regulatory Comm'n*, 828 F.3d 949, 959 (D.C. Cir. 2016) (holding that an applicant's future coordination with federal and local authorities was an appropriate component of FERC's independent NEPA review); *Friends of Ompompanoosuc v. FERC*, 968 F.2d 1549, 1555 (2d Cir. 1992) (concluding that FERC has rational basis to find that environmental impact will be adequately compensated because regulated parties had a responsibility to work with local agencies to develop compensation). Finally, FERC may rely on and reference regulatory standards promulgated by other agencies in assessing impacts. *See Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, 255 F. Supp. 3d 101, 125–27 (D.D.C. 2017) (noting that agencies can rely on regulatory standards from other agencies when conducting a NEPA analysis).
[45] WELC Comments at pp. 20; Oregon Women's Land Trust, Accession No. 20190702-5054 at p. 5 (July 2, 2019) ("OWLT Comments").

Transportation ("USDOT") will address these risks.[46] USDOT regulations address security for LNG facilities,[47] and USDOT will issue a Letter of Determination stating whether JCEP can comply with its regulations.[48] USDOT will also have continuing inspection and enforcement responsibilities over the Terminal.[49] USDOT regulations also require coordination with local law enforcement officials.[50] The USCG regulations address security for the LNG tankers and the marine transfer area between the LNG vessels and the facility, up to the last valve before the Terminal.[51] On May 10, 2018, the USCG issued a Letter of Recommendation to FERC concluding that the Project is appropriate for the location.[52] Before beginning operations, JCEP will be required to submit a Facility Security Assessment and a Facility Security Plan to the USCG; these plans will specifically address "security threats and consequences of an attack, and facility protective measures."[53] The USCG will also have ongoing inspection and enforcement responsibilities.[54] For purposes of satisfying its NEPA obligations, FERC can rely on the conclusions of USDOT's and the USCG's independent assessments regarding safety and security issues.[55] Further, FERC can rely on future coordination between JCEP and USCG, USDOT, and local law enforcement.[56] In addition, the DEIS notes that the LNG vessels will comply with the International Marine Organization's International Ship and Port Facility Security Code, which is aimed at preventing and suppressing terrorism.[57] FERC considered the security issues in the DEIS and is not required to do more.

Some commenters note that the Federal Aviation Administration ("FAA") has issued Notices of Presumed Hazard regarding the proximity of LNG tanks to the local airport and flight paths.[58] They allege that the proposed structures would violate FAA obstruction standards, rendering air operations unsafe.[59] The DEIS addresses these FAA issues and notes the continuing efforts of JCEP and the FAA to address them, including various potential mitigation measures that might be implemented.[60] Again, JCEP will have to satisfy the FAA that the Project is not a hazard to air navigation pursuant to the FAA's Part 77 rules, and the Commission may rely on the conclusions of the FAA in conducting its independent assessments.[61] Further, the Commission

[46] DEIS at p. 4-698.
[47] *Id.* at pp. 4-699 - 4-702 (citing 49 CFR Part 193).
[48] *Id.* at p. 4-702.
[49] *Id.* at p. 4-698.
[50] *Id.* at p. 4-711.
[51] *Id.* at pp 4-703 – 4-710 (citing 46 C.F.R. Part 154, 33 C.F.R. Part 105, 33 C.F.R. Part 127).
[52] *Id.* at p. 4-709.
[53] *Id.* at p 4-710.
[54] *Id.* at p. 4-711.
[55] *Sierra Club v. Clinton*, 746 F. Supp. 2d at 1038 (agency utilizing another agency's assessment of particular impacts as support for its independent NEPA assessment).
[56] *Id.*
[57] DEIS at pp. 4-704 to 4-706.
[58] *See, e.g.*, Comments of League of Women Voters, Accession No. 20190705-5052 at pp. 9, 16, 100 (July 5, 2019) ("League of Women Voters Comments"); Comments of James Neu, Accession No. 20190627-0203 at p. 4 (Jun 26, 2019) ("James Neu Comments"); Comments of Oregon Physicians for Social Responsibility, Accession No. 20190701-5142 (July 1, 2019).
[59] Comments of Cindy Oqier, Accession No. 20190703-0079 at p. 3 (July 3, 2019).
[60] DEIS at p. 1-22, 4-750.
[61] *Sierra Club v. Clinton*, 746 F. Supp. 2d at 1038 (agency utilizing another agency's assessment of particular impacts as support for its independent NEPA assessment).

can rely on future coordination between an applicant and the FAA in its Final EIS.[62] NEPA requires no more.

One commenter noted that the DEIS did not mention the need for a Oregon Department of Geology and Mineral Industries ("DOGAMI") permit.[63] The Project does not require a "mining" permit from DOGAMI.[64] Regardless, the Commission can rely on future coordination between an applicant and state regulators, and make the reasonable assumption that the Project will obtain all necessary state authorizations, in its NEPA assessment.[65] FERC adequately considered the issues in the DEIS and it is not required to do more.

Another commenter argues that the Project is inconsistent with local and state-wide coastal management policies and zoning, and that the DEIS is insufficient because the Applicants have not received all approvals from local and state agencies.[66] The commenter specifically notes that the Applicants have not received a determination of consistency with the Oregon Coastal Management Plan, and speculates that the State of Oregon will not issue a determination of consistency for the Project.[67] The DEIS properly recommends that the Applicants file a Consistency Determination issued by the State of Oregon under the Coastal Zone Management Act prior to construction of the Project.[68] Based on court precedent, the Commission has concluded that there is "no impropriety in our routine practice of issuing a final order granting authorization for a project contingent on findings of future studies and favorable decisions on requests pending before other agencies."[69] The Commission has further explained that requiring additional information or approvals to be submitted before construction is within the Commission's "extremely broad authority" to condition authorizations under Sections 3 and 7 of the NGA.[70] Thus, the DEIS appropriately recommends conditions to require submission of certain future federal and state approvals before construction, which reviewing courts have found to be consistent with the public's participation rights.

B. **Oregon State Agency Comments**

The Oregon Department of Justice submitted extensive comments during the public comment period on behalf of itself and various state agencies, including the Oregon Department of Environmental Quality ("ODEQ"), the Oregon Department of Land Conservation and Development ("DLCD"), the Oregon State Historic Preservation Office ("SHPO"), the Oregon

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[62] *Supra* n.44.
[63] Grand Ronde Comments at p. 5.
[64] Oregon House Bill (HB) 3309 (June 25, 2019).
[65] *Supra* n.44.
[66] League of Women Voters Comments at p. 111.
[67] *Id*.
[68] DEIS at 4-410.
[69] *Ruby Pipeline, L.L.C.*, 133 FERC ¶ 61,015 at P 19 (2010).
[70] *Id*. at P 16 (citing *Transcontinental Gas Pipe Line Corp. v. FERC*, 589 F.2d 186, 190 (5th Cir. 1979); *FPC v. Transcontinental Gas Pipe Line Corp*., 365 U.S. 1, 7 (1961) (the Commission is the guardian of the public interest and has a wide range of discretionary authority in determining whether authorizations should be granted)); *see also Freeport LNG Development, L.P., et al.*, 167 FERC ¶ 61,155 at P 15 and n.36 (2019) (noting that authorizations pursuant to Section 3 may be approved "in whole or in part, with such modification and upon such terms and conditions as the Commission may find necessary or appropriate") (citing *Distrigas Corporation v. FPC*, 495 F.2d 1057, 1063-64 (D.C. Cir. 1974), *cert. denied*, 419 U.S. 834 (1974), *Dynegy LNG Production Terminal, L.P.*, 97 FERC ¶ 61,231 (2001).

Department of Energy ("ODOE"), the Oregon Department of Transportation ("ODOT") and others. The vast majority of the state agency comments relate to other permitting requirements applicable to the Project, such as those arising under Clean Water Act ("CWA") Section 401, the Coastal Zone Management Act, the National Historic Preservation Act ("NHPA"), and federally delegated permits under the CWA and Clean Air Act ("CAA"). Applicants' responses here are focused solely on responding to NEPA issues and comments on the DEIS. The Applicants will continue to work with the relevant Oregon state agencies having permitting and review authority over the Project in the coming weeks and months to address any outstanding comments, and the information requests contained within those comments, for these other applicable state authorizations that are beyond the scope of the DEIS.

C. The DEIS's Purpose and Need Statement Satisfies NEPA's Requirements and is not Impermissibly Narrow.

The Commission's analysis of the Project under NEPA must reflect the Project's purpose and need. CEQ's regulations provide that the statement of purpose and need must "briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action."[71] When federal agencies are responding to an applicant's request for authorization, courts have held that agencies have a duty to consider the applicant's purpose and the objectives of the applicant's project.[72]

One commenter argues that the statement of purpose and need is inadequate because it does not state both the reason why the action is being proposed and what the Commission expects to achieve.[73] However, the DEIS does both. As stated in the DEIS, the Project is a market-driven response to the increase in natural gas supplies in the U.S. Rocky Mountain and Western Canadian production areas and the growth of international demand, particularly in Asia. The Project's purpose is to export natural gas supplies derived from existing interstate natural gas transmission systems to these overseas markets.[74] The purpose of PCGP's Pipeline is to connect the existing natural gas transmission systems of Gas Transmission Northwest LLC ("GTN") and Ruby Pipeline, LLC ("Ruby") with the proposed LNG export terminal.[75] The record before the Commission contains JCEP's robust needs assessment in Resource Report 1, which more fully documents the market need for the Project.[76]

Some commenters argue that the DEIS's statement of purpose and need is impermissibly narrow and limits the range of reasonable alternatives because it is based on the goals of the applicants rather than the relevant statutory purpose.[77] These arguments misunderstand NEPA as

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[71] 40 C.F.R. § 1502.1.

[72] *See Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 199 (D.C. Cir. 1991); *see also Friends of Santa Clara River v. U.S. Army Corps of Eng'rs*, 887 F.3d 906, 912 (9th Cir. 2018) (quoting *Sylvester v. U.S. Army Corps of Eng'rs*, 882 F.3d 407, 409 (9th Cir. 1989); *Louisiana Wildlife Fed'n, Inc. v. York*, 761 F.2d 1044, 1048 (5th Cir. 1985)); *Citizens for Smart Growth v. Sec'y of Dep't of Transp.*, 669 F.3d 1203, 1213 (11th Cir. 2012).

[73] CTCLUSI Comments at pp. 12.

[74] DEIS at pp. 1-6.

[75] DEIS at p. 1-6.

[76] Section 3 Application of Jordan Cove Energy Project L.P., Accession No. 20170921-5142 at Resource Report 1 at Section 1.1 (Sept. 17, 2017) ("JCEP LNG Terminal Application" and "JCEP Resource Report 1" respectively).

[77] NRDC Comments at pp. 27-31; Comments of Jackson County, Oregon, Accession No. 20190702-5135, at pp. 1-2 (July 2, 2019) ("Jackson County Comments").

applied in the context of a federal licensing or permitting situation, as is the case here. As noted above, the DEIS's statement of purpose and need is appropriately informed by the goals of the applicant, an approach that has been confirmed in case law and Commission precedent.[78] As the Commission has noted, courts have upheld federal agencies' use of applicants' identified project purpose and need and have used it as the basis for evaluating alternatives.[79] Thus, Commission Staff reasonably determined that the Project's purpose and need is to export natural gas supplies derived from existing interstate natural gas transmission systems to overseas markets and to connect the existing GTN and Ruby natural gas transmission systems with the proposed LNG export terminal.[80] Commenters' suggestions that the Commission depart entirely from the purpose of the proposed Project is not appropriate, as courts have held that "[a]n agency cannot redefine the goals of the proposal that arouses the call for action; it must evaluate alternative ways of achieving *its* goals, shaped by the application at issue and by the function that the agency plays in the decisional process."[81]

Finally, one commenter argued that the purpose and need statement adopted by the United States Army Corps of Engineers ("USACE") was so narrowly defined that it failed to meet the Least Environmentally Damaging Practicable Alternative Standard under Section 404(b)(1) of the Clean Water Act.[82] Similarly, they alleged that the Fish and Wildlife Service and National Marine Fisheries Service are negligent in their Fish and Wildlife Coordination Act responsibilities by allowing such a narrow purpose and need statement.[83] Both comments are beyond the scope of the DEIS. While FERC's NEPA analysis can be relied upon by cooperating federal agencies, it is not intended to satisfy every regulatory requirement applicable to the Project. The Commission crafted its purpose and need statement and conducted an independent evaluation of the environmental effects of the Project *under NEPA*. As the lead agency, the Commission's independent assessment of the purpose and need related to the Project is adequate.[84] Furthermore, the DEIS does not purport to contain the 404(b)(1) analysis or to identify the Least Environmentally Damaging Practicable Alternative. Nor must it. As the DEIS notes, the USACE must make this decision when issuing a Section 404 permit,[85] and that analysis and decision are made pursuant to the Clean Water Act, not NEPA. Likewise, the Commission's NEPA analysis does not purport to satisfy the Services' wildlife consultation obligations under other statutes. Attacks on the NEPA document for not containing analyses required under other statutes, which will be undertaken and documented separately, are misplaced.

[78] *See Nat'l Fuel Gas Supply Corp.*, 164 FERC ¶ 61,084 at PP 80, 101 (2018) (reiterating how "courts have upheld federal agencies use of applicants' identified project purpose and need as the basis for evaluating alternatives"); *City of Grapevine, Tex. v. Dep't of Transp.*, 17 F.3d 1502, 1506 (D.C. Cir. 1994).
[79] *City of Grapevine*, 17 F.3d at 1506.
[80] DEIS at p. 1-6.
[81] *Busey*, 938 F.2d at 199 (emphasis in original); *see also Friends of Santa Clara River*, 887 F.3d at 912 ("Indeed, it would be bizarre if the [Commission] were to ignore the purpose for which the applicant seeks a [project] and to substitute a purpose [the Commission] deems more suitable." (quoting *York*, 761 F.2d at 1048).
[82] Comments of John L. Marshall, Accession No. 20190628-5017 at p. 1 (June 28. 2019) ("John Marshall Comments").
[83] John Marshall Comments at p. 1.
[84] *Steamboaters*, 759 F.2d at 1393–94.
[85] *See* DEIS at p. 3-1.

D. **Connected Actions**

"Connected actions" are defined as those that (i) automatically trigger other actions, (ii) cannot proceed unless other actions are undertaken previously or simultaneously, or (iii) are interdependent parts of a larger action and depend on the larger action for their justification.[86] The LNG Terminal and the Pipeline are connected actions and are considered together in the DEIS.

One commenter has confused the Project with the Port Channel Major Modification project, a separate project proposed by the Oregon International Port of Coos Bay.[87] The Port Channel major modifications are not part of the Project, and are not necessary for the Project to be constructed and operated as designed. Still other commenters have asserted that the major modifications to the Port Channel are a connected action.[88] This is incorrect. The test that most courts have applied to determine whether separate actions subject to federal permitting are "connected" for purposes of NEPA is whether the project has independent utility – that is, whether each project will be undertaken regardless of whether any other subsequent or contemporaneous project is undertaken, or whether one project necessarily causes a separate project to occur. Here, the Project does not depend on any other actions for its justification, including the Port's proposed major channel modifications, nor does it automatically cause other actions to occur. Therefore, the proper scope of the EIS for the Project is limited to the LNG Terminal and the Pipeline.[89]

Other commenters assert that decisions of cooperating agencies, including the Department of Energy's Office of Fossil Energy ("DOE/FE") review, are connected actions.[90] Section 1.3 of the DEIS addresses the role of various federal agencies, including the DOE/FE, and explains that DOE/FE "may adopt [the] EIS to consider the environmental effects associated with its decision whether to authorize the export of LNG."[91] Table 1.5.1-1 in the DEIS lists all of the major permits, approvals, and consultations that are required for the Project. CEQ's regulations explicitly allow other agencies to adopt the NEPA analysis prepared by a Lead Agency.[92]

In any event, the D.C. Circuit has previously found DOE's and FERC's coordinated review of LNG export projects to be appropriate. "[T]he Commission's NEPA analysis did not have to address the indirect effects of the anticipated *export* of natural gas."[93] DOE/FE, as a cooperating agency, may rely on the Commission's EIS and additional materials in order to satisfy its obligations under NEPA.[94] Nothing more is required.

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[86] 40 C.F.R. § 1508.25(a).
[87] Comments of James Fereday, Accession No. 20190624-5027 at p. 9 (June 24, 2019) ("James Fereday Comments").
[88] Comments of Oregon State Agencies, submitted on behalf of the commenting agencies by the Oregon Department of Justice, Accession No. 20190703-5209 at p. 21 (July 3, 2019) ("Oregon State Agencies Comment").
[89] The DEIS does consider the impacts of the Navigational Reliability Improvements ("NRIs"), which comprise four discrete areas of dredging located at turns in the Coos Bay Federal Navigation Channel ("FNC"). These NRIs require permits from the Corps of Engineers, are necessary for the Project to operate as designed, and are connected actions analyzed in the DEIS. But that is not the case with respect to the Port's proposal to deepen and widen the FNC throughout Coos Bay.
[90] WELC Comments at pp. 275-276.
[91] DEIS at p. 1-10.
[92] 40 C.F.R. § 1506.3.
[93] *Sierra Club v. FERC*, 827 F.3d at 47.
[94] *Sierra Club v. Dep't of Energy*, 867 F.3d 189, 193 (D.C. Cir. 2017).

E. **Alternatives**

1. The Alternatives Analysis in the DEIS is Sufficiently Detailed and Broad

As explained above in Section II.B, several commenters incorrectly argue that the Project's statement of purpose and need is too narrow, causing various alternatives to be dismissed from consideration prematurely and without an adequate basis.[95] An agency may not frame its statement of purpose and need so broadly that "the project would collapse under the weight of the possibilities,"[96] nor may it "redefine the goals of the proposal that arouses the call for action; it must evaluate alternative ways of achieving *its* goals, shaped by the application at issue and by the function that the agency plays in the decisional process."[97] Courts have upheld federal agencies' use of applicants' identified project purpose and need as the basis for evaluating alternatives.[98] Thus, Commission Staff reasonably determined that the Project's purpose is to export natural gas supplies derived from existing interstate natural gas transmission systems, linked to supply basins in Western Canada and the U.S. Rocky Mountains, to overseas markets.

This is not, as some commenters allege,[99] an unreasonably narrow formulation that precludes consideration of alternative sites. Indeed, the DEIS discussed numerous other potential LNG terminal sites that would similarly allow the Applicants to export natural gas sourced from Canadian and Rocky Mountain natural gas supply basins.[100] NEPA only requires an agency to consider "reasonable" alternatives consistent with the project's purpose[101] that are also technically and economically practicable and feasible.[102] When a very large number of alternatives are potentially available, the agency need only consider a reasonable number that covers the spectrum of alternatives.[103] The Commission's consideration of alternatives "is sufficient if it considers an appropriate range of alternatives, even if it does not consider every available alternative."[104] Here, the DEIS considers four different harbors that could reasonably be used for a deepwater LNG

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[95] *See e.g.*, NRDC Comments at pp. 27-31; Trout Unlimited, Accession No. 20190703-5147 at p. 3 (July 3, 2019) ("Trout Unlimited Comments"); Comments of Paul Watte, Accession No. 20190408-5070 at p. 1 (Apr. 8, 2019) ("Paul Watte Comments"); League of Women Voters Comments at pp. 24-25.

[96] *Busey*, 938 F.2d at 199 (emphasis in original); *see also Friends of Santa Clara River v. U.S. Army Corps of Eng'rs*, 887 F.3d at 912 (9th Cir. 2018) (quoting ("Indeed, it would be bizarre if the [Commission] were to ignore the purpose for which the applicant seeks a [project] and to substitute a purpose [the Commission] deems more suitable." (quoting *Louisiana Wildlife Fed'n, Inc. v. York*, 761 F.2d 1044, 1048 (5th Cir. 1985)).

[97] *Busey.*, 938 F.2d at 199 (emphasis in original); *see also Louisiana Wildlife Fed'n, Inc.*, 761 F.2d at 1048 ("Indeed, it would be bizarre if the [Commission] were to ignore the purpose for which the applicant seeks a [project] and to substitute a purpose [the Commission] deems more suitable.").

[98] *See Nat'l Fuel Gas Supply Corp.*, 164 FERC ¶ 61,084 at PP 80, 101 (2018) (reiterating how "courts have upheld federal agencies use of applicants' identified project purpose and need as the basis for evaluating alternatives"); *City of Grapevine, Tex.*, 17 F.3d at 1506.

[99] *Id*.

[100] DEIS pp. 3-8 to 3-14.

[101] *See* 40 C.F.R. § 1502.14.

[102] *Guidance Regarding NEPA Regulations*, 48 Fed. Reg. 34,263, 34,267 (July 28, 1983) (stating that "reasonable alternatives include those that are *practical or feasible* from the technical and economic standpoint" (emphasis added)); s*ee also League of Wilderness Defenders-Blue Mountains Biodiversity Project*, 689 F.3d at 1072-73 (stating that, to be a reasonable alternative under NEPA, an alternative must also satisfy the underlying purpose and need for the proposed action.).

[103] CEQ, *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, 46 Fed. Reg. 18,026, 18,027 (1981).

[104] *See Headwaters, Inc. v. Bureau of Land Mgmt.*, 914 F.2d 1174, 1180-81 (9th Cir. 1990).

terminal in the Pacific Northwest consistent with the Project's purpose and need, and explains why others were eliminated from detailed consideration.[105]

Some commenters contend that the criteria used to evaluate alternatives in the DEIS are different from the "sliding scale" articulated in the Certificate Policy Statement.[106] These comments, however, conflate two distinct analyses. According to the Commission's Certificate Policy Statement, a granting of a certificate of public convenience and necessity requires a greater showing of public benefit from a project with greater adverse impacts.[107] This standard informs the issuance of a certificate of public convenience and necessity under the Natural Gas Act, whereas NEPA and its implementing regulations determine the range of alternatives that must be considered in a NEPA analysis.[108] Therefore, commenters are wrong that the DEIS must incorporate the standards from the Certificate Policy Statement into the evaluation screening criteria the DEIS uses to develop its alternatives analysis under NEPA.

Commenters also argue that these screening criteria for alternatives prematurely eliminated reasonable alternatives.[109] In particular, commenters contend that the criterion that alternatives must offer "a significant environmental advantage over the proposed action" was inappropriate. However, this misconstrues the Commission's obligation under NEPA. The Commission is allowed to define criteria for consideration of a reasonable range of alternatives, and "NEPA's injunction that agencies consider the environmental impacts of 'all reasonable alternatives' does not substantively constrain an agency's choice" of such criteria.[110] In the case of linear projects, there is an almost infinite range of alternatives to get from Point A to Point B. NEPA does not require federal agencies to evaluate every conceivable alternative.[111] FERC's decision to eliminate from detailed consideration alternatives similar to those analyzed in the DEIS, but which do not offer any significant environmental advantages, is reasonable.

Moreover, the CEQ's regulations only require the agency to "*briefly* discuss the reason for [an alternative] having been eliminated,"[112] and courts have found that agencies are not obligated to perform in-depth analysis of rejected alternatives.[113] Here, the DEIS includes a 45-page analysis of the no action alternative, numerous potential system alternatives, several different potential LNG terminal sites and accompanying pipeline routes, and nearly two dozen alternative routes and variations.[114] Where alternatives were eliminated from further analysis, Commission Staff provides the requisite explanation,[115] including making a reasoned decision regarding certain

[105] DEIS at Section 3.3.
[106] *See* Comments of Snattlerake Hills, LLC, Accession No. 20190705-5185 at p. 38 (July 5, 2019) ("Snattlerake Comments").
[107] *Certification of New Interstate Natural Gas Pipeline Facilities*, 88 FERC ¶ 61,227 (1999), *clarified*, 90 FERC ¶ 61,128 (2000), *further clarified*, 92 FERC ¶ 61,094 (2000) ("*Certificate Policy Statement*").
[108] *Compare id. with* 15 U.S.C. § 717f(c).
[109] *See* NRDC Comments at p. 38.
[110] *City of Alexandria v. Slater*, 198 F.3d 862, 867 (D.C. Cir. 1999).
[111] *See Native Ecosystems Council v. U.S. Forest Service*, 428 F.3d 1233, 1246 (9th Cir. 2005) (finding no minimum number of alternatives that must be considered, and upholding EIS that considered proposed action and the no action alternative).
[112] 40 C.F.R. § 1502.14 (emphasis added).
[113] *See, e.g.*, *Citizens for Smart Growth*, 669 F.3d at 1213.
[114] DEIS at pp. 3-1 to 3-45.
[115] *See, e.g.*, DEIS at p. 3-11 (explaining the reason for rejection of certain alternatives using criteria such as pipeline construction footprint, freshwater and estuary impacts, listed species, and nearby residences).

reduced impacts. Record evidence supports the proposed Project in each of these situations. As a result, the Commission considered an appropriate range of alternatives.

2. The DEIS Contains an Adequate Analysis of the No Action Alternative

Some commenters incorrectly argue that the analysis of the no action alternative is deficient.[116] The DEIS reasonably concludes that the no action alternative will not meet the purpose and need that is driving the Applicants' Project. Given the lack of existing pipelines and terminals at the Project's receipt and delivery points and lack of sufficient existing capacity on other interstate pipelines that could be used to satisfy existing overseas demand for and relieve oversupply in the Canadian and Rocky Mountain natural gas supply basins, the Project creates the additional capacity necessary to meet this demand and relieve this oversupply.[117]

Commenters argue that the DEIS's "no action" alternative analysis relies on circular logic because it assumes the action being proposed would occur anyway in the form of another project, rendering the no action alternative a nullity.[118] In the case of a NEPA analysis of a federal licensing or permitting situation, the no action alternative in the DEIS reflects the scenario where the federal authorizations required for the Project would not be issued, and therefore, the Project would not be built.[119] FERC must consider the reasonably foreseeable impacts of that scenario—that is, where the proposed JCEP and PCGP Project is not built—and the Commission reasonably determined the demonstrated need for the project would be addressed by other means. The record before the Commission, however, includes information about existing site zoning, market conditions, and the potential for substitute projects that would seek to satisfy the same demand that is driving the Project.[120] The DEIS therefore reasonably concludes that in such a scenario, other gas transmission projects would likely be developed to transport the gas that overseas markets seek.[121]

Commenters claim that this is improper and suggest that the Commission must investigate what a preserved status quo would look like,[122] apparently assuming that no project whatsoever would be built if the Applicants' Project were not. But courts have held there is no such requirement for the "no action" alternative to represent efforts to maintain the status quo.[123]

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[116] *See* NRDC Comments at p. 32; Comments of Pamela B Ordway, Accession No. 20190705-5206 at pp. 3-4 (July 5, 2019) ("Pamela Ordway Comments").
[117] DEIS at p. 3-4.
[118] *See* NRDC Comments at pp. at 32-34.
[119] *See Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, 46 Fed. Reg. 18,026, 18,027 (1981) (noting that for federal decisions on proposed projects, "no action" means "the proposed activity would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity"); *All Indian Pueblo Council v. U.S.*, 975 F.2d 1437 (10th Cir. 1992) (upholding rejection of no action alternative comprising federal agencies refusing requested permits and rights-of-way).
[120] *See* JCEP LNG Terminal Application, Resource Report 10 at p. 3.
[121] *Compare* DEIS at p. 3-4 *with Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, 46 Fed. Reg. 18,026, 18,027 (1981) ("[w]here a choice of 'no action' by the agency would result in predictable actions by others, this consequence of the 'no action' alternative should be included in the analysis") *and Young v. General Services Admin.*, 99 F.Supp.2d 59, 74–75 (2000) (finding that "no action" does not require the agency to assume nothing will occur).
[122] *See* NRDC Comments at pp. 33-34.
[123] *See Young v. General Services Admin.*, 99 F.Supp.2d at 74-75.

Rather, it is appropriate for the agency to forecast the potential environmental consequences of the agency not authorizing the proposed action. When doing so, NEPA does not require the Commission to embed within the no action alternative any such speculative future scenarios that it does not find reasonably likely to occur. The DEIS adequately finds that "[u]nder the No Action Alternative, the proposed action would not occur, the permits and authorizations listed in section 1.5 would not be required, and as a result, the environment would not be affected."[124]

The DEIS reasonably concludes that natural gas will make it to overseas, particularly Asian, markets regardless of whether JCEP's specific project is built, given the demand for the gas. This conclusion does not assume that the Commission undertakes the same action being proposed. Indeed, if this Project was not built to serve this existing demand, it is reasonable for the Commission to assume for NEPA analytical purposes that other projects would take its place.

3. The DEIS provides an Adequate Analysis of System Alternatives

FERC evaluated several potential system alternatives, including potential use of existing interstate and intrastate pipelines (e.g., the Northwest, GTN, Ruby, and Coos County pipelines), potential use of existing LNG storage facilities in Oregon and Washington, and potential existing or proposed LNG facilities all the way from Alaska and western Canada down to Mexico.[125] In each case, the DEIS provides a reasoned analysis and justification for why each was not advanced for further study.

For the alternatives that were analyzed, commenters argued that the analysis was insufficient and requested further justification for the alternatives,[126] but in each case, the level of detail provided is commensurate with what NEPA requires. As discussed earlier, the agency need only "*briefly* discuss the reason for [an alternative] having been eliminated,"[127] and courts have found that agencies are not obligated to perform in-depth analysis of rejected alternatives.[128]

The Commission engaged in a systematic process to identify reasonable and practical alternatives that meet the Project's purpose and need, including system alternatives.[129] Several facilities on the West Coast were reviewed as possible site alternatives that could potentially make use of existing system infrastructure.[130] The DEIS also analyzed other interstate and intrastate pipelines and eliminated various possibilities based on those pipelines' inability to meet the capacity requirements of the Project, and the need to construct additional parallel or looping lines to expand those systems' capacities.[131] Commenters requested additional review of an alternative using certain Oregon and Washington LNG storage facilities.[132] However, the DEIS explains that this alternative was eliminated from consideration because these existing facilities are not designed to export LNG, so would not meet the Project's purpose and need, and they would similarly require

[124] DEIS at p. 3-3.
[125] DEIS at pp. 3-4 to 3-8.
[126] *See* NRDC at p. 37.
[127] 40 C.F.R. § 1502.14 (emphasis added).
[128] *See, e.g., Citizens for Smart Growth v. Sec'y of Dep't of Transp.*, 669 F.3d at 1213 (11th Cir. 2012).
[129] *See* DEIS at pp. 3-1 to 3-45.
[130] *See* DEIS at pp. 3-4 to 3-8.
[131] DEIS at pp. 3-7 to 3-8.
[132] NRDC Comments at pp. 37-38.

significant modifications to meet Project requirements.[133] This is a sufficient explanation for why the storage facilities were not considered further.

4. The Commission is not required to assess renewable energy resources as an alternative to the Project.

Commenters requested that the Commission explore alternatives to the Project such as renewable energy resources.[134] However, this is not a reasonable alternative to the Project. Commission Staff reasonably determined that the Project's purpose is to export natural gas supplies derived from existing interstate natural gas transmission systems to overseas markets, and that other energy alternatives do not meet this purpose and need.[135] Implementing commenters' suggestions to depart entirely from the purpose of the proposed Project would violate NEPA as courts have held that "[a]n agency cannot redefine the goals of the proposal that arouses the call for action; it must evaluate alternative ways of achieving *its* goals, shaped by the application at issue and by the function that the agency plays in the decisional process."[136]

5. The analysis of various site alternatives satisfies NEPA's requirements.

Several commenters question why some site alternatives were not included in the DEIS's site alternative analysis.[137] The Commission need not analyze every project permutation and variation to meet its NEPA obligations.[138] Rather, the Commission must "set forth . . . those alternatives necessary to permit a reasoned choice."[139] The Commission's consideration of alternatives satisfies NEPA if it considers an appropriate range of alternatives, even if it does not consider every available alternative.[140]

For example, one commenter argues that the DEIS is insufficient because it does not consider a site at Cherry Point, Washington, that connects to existing pipeline infrastructure.[141] The DEIS appropriately used screening criteria to identify reasonable alternatives, including whether the site had adequate available land, adequate waterfront access and channel depth for LNG carrier access (at least 36 feet MLLW), and access to gas from both the GTN and Ruby pipelines (an important aspect necessary to meet the Project's purpose of accessing natural gas supply basins in both Western Canada and the U.S. Rocky Mountains).[142] The Commission reviewed potential alternative sites along the entire Western Coast, with particular focus on sites

[133] DEIS at p. 3-5.
[134] *See, e.g.*, Comments of Mark H. Coaffney, Accession No. 20190705-0022 at p. 3 (July 5, 2019) ("Mark Coaffney Comments"); Comments of Sierra Club, Accession No. 20190705-5236 (July 5, 2019) ("Sierra Club Comments").
[135] DEIS at p. 3-1.
[136] *Busey*, 938 F.2d at 199 (emphasis in original); *see also Louisiana Wildlife Fed'n, Inc.*, 761 F.2d at 1048 ("Indeed, it would be bizarre if the [Commission] were to ignore the purpose for which the applicant seeks a [project] and to substitute a purpose [the Commission] deems more suitable.").
[137] *See, e.g.*, Paul Watte Comments at p. 1.
[138] *See Headwaters*, 914 F.2d at 1180-81.
[139] *Navajo Nation v. U.S. Forest Serv.*, 408 F. Supp. 2d 866, 874 (D. Ariz. 2006), *aff'd in part, rev'd in part and remanded on other grounds*, 479 F.3d 1024 (9th Cir. 2007).
[140] *See Headwaters*, 914 F.2d at 1180-81.
[141] Paul Watte Comments at p. 1.
[142] DEIS at p. 3-10.

in California, Oregon, and Washington, and ultimately carried forward five alternative sites that met the screening criteria into the DEIS for further analysis.[143]

The Commission had good reason for not carrying forward any Cherry Point alternative. For one, Cherry Point does not have access to a channel deep enough to accommodate the anticipated LNG vessels with a loaded draft of 36 feet.[144] A review of available information indicates that the Vessel Traffic Services Area surrounding Cherry Point varies between 12 and 30 feet deep, and the nearest point that reaches a depth of 36 feet is approximately two nautical miles away from the Cherry Point site.[145] Moreover, even if Cherry Point did meet the screening criteria and was carried forward for review in the DEIS, it would likely be eliminated for the same reason as the Grays Harbor, Washington, site. Cherry Point is farther from the GTN and Ruby pipeline connection point near Malin, Oregon than the Grays Harbor alternative, and would require a similar suite of supply pipeline expansions that Grays Harbor would.[146] Thus, even if a Cherry Point alternative had been carried forward in the analysis, it would have been eliminated both because it does not satisfy the screening requirements necessary to be feasible and meet the Project's purpose and need, and because it, like Grays Harbor, would result in a significant increase in impacts associated with pipeline expansions in order to bring U.S. Rocky Mountain gas from Malin to the Cherry Point site.

One commenter claims that the DEIS fails to properly consider impacts to the human environment and places too much emphasis on the natural environment when determining that the Wauna, Oregon, alternative does not offer a significant environmental advantage over the proposed site.[147] The commenter claims that locating the Terminal in the rural site of Wauna rather than the more urban area of Coos Bay would cause a far less negative impact on the *human* environment, even if it resulted in more impacts on the natural environment.[148] This is incorrect for at least two reasons. First, NEPA does not recognize the distinction the commenter suggests between "human" and "natural" environments. Rather, CEQ's regulations direct that the "human environment" is to be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment.[149] Furthermore, the effects on the human environment include those related to ecological, aesthetic, historic, cultural, economic, social, and health issues.[150] Thus, the "human" environment that the commenter advocates to be treated superior to the natural environment actually includes, pursuant to CEQ regulations, the natural environment. Second, as stated in the DEIS, connecting the Wauna site to the GTN and Ruby pipelines would require 146 more miles of supply pipeline length than the proposed Project and require an estimated 3,154 additional acres of disturbance for pipeline construction.[151] Although the Wauna site is rural, the 3,154 additional acres of disturbance for pipeline construction would cause increased impacts on more aspects of the "human" environment, as framed by the

[143] DEIS at pp. 3-8 to 3-10.
[144] National Oceanic and Atmospheric Administration, *Rosario Strait to Cherry Point Nautical Chart: Soundings in Feet* (2019), *available at* https://www.charts.noaa.gov/PDFs/18431.pdf.
[145] *Id*.
[146] *See* DEIS at p. 3-11 for environmental impacts of the Grays Harbor alternative.
[147] League of Women Voters Comments at pp. 24-25.
[148] *Id*.
[149] 40 C.F.R. § 1508.14.
[150] 40 C.F.R. § 1508.8.
[151] DEIS at p. 3-10.

commenter. The DEIS reasonably concluded that the Wauna site did not merit additional detailed analysis.

The commenter acknowledges that the Wauna site lacks nearby infrastructure access to natural gas supplies that are available from the Ruby Pipeline. Omitting any source access from Ruby or the U.S. Rocky Mountains would result in an alternative that does not meet the Project purpose, and is therefore not a reasonable alternative.[152] The Applicants cannot meet the gas supply needs of the Terminal and the purpose of the overall Project without accessing U.S. Rocky Mountain supplies, which are available from the Ruby pipeline.[153] Thus, an alternative siting of the Terminal in Wauna and only connecting to the Pacific Northwest Pipeline does not meet the Project purpose and is not a reasonable alternative.

The Commission has significant discretion in weighing alternatives.[154] NEPA does not impose substantive obligation to select the most environmentally preferable alternative.[155] Rather, the Commission is simply required to take a hard look at the environmental consequences of the proposed action and reasonable alternatives, as it has done in this case.[156] The DEIS supports the Commission's determination that none of the alternative sites, including Wauna, offer a significant environmental advantage over the proposed site.[157] This process of weighing environmental impacts, and not the selection of a certain alternative, is what demonstrates compliance with NEPA.

6. The analysis of various route and variation alternatives satisfies NEPA's requirements.

Some commenters claim that the DEIS's discussion of alternatives is insufficient and that eliminated alternatives should be retained for a more in-depth analysis.[158] The DEIS explains why numerous potential route variations or adjustments were not preferable and why they were eliminated from further analysis. For example, one commenter argues that the DEIS is insufficient because the All Highway Alternative was not fully explored and that the DEIS does not support the conclusion that this alternative would not offer a significant environmental advantage.[159] However, the DEIS explains that the All Highway Alternative was not preferable because it would result in approximately 600 acres of additional construction disturbance and would encounter significant constraints due to highway fills, elevated roadway sections, overpasses and underpasses, and interchange, as well as constraints caused by commercial, industrial, and residential developments located immediately adjacent to highways.[160] As noted above, the CEQ's

[152] League of Women Voters Comments at pp. 24-25.
[153] JCEP Resource Report 10.
[154] *Federal Power Comm'n v. USCA Transcon. Gas Pipeline Corp.*, 365 U.S. 1, 7 (1961) (the Commission is "the guardian of the public interest," entrusted "with a wide range of discretionary authority").
[155] *See Myersville Citizens for a Rural Cmty., Inc. v. FERC*, 783 F.3d 1301, 1324 (D.C. Cir. 2015) ("Even if an agency has conceded that an alternative is environmentally superior, it nevertheless may be entitled under the circumstances not to choose that alternative.").
[156] *See Sierra Club v. Dep't of Energy*, 867 F.3d at 196; *Del. Riverkeeper Network v. FERC*, 857 F.3d 388, 394 (D.C. Cir. 2017).
[157] DEIS at p. 3-10.
[158] *See e.g.*, Trout Unlimited Comments at pp. 3-4.
[159] Trout Unlimited Comments at pp. 3-4.
[160] DEIS at pp. 3-15 to 3-16.

regulations only require a brief discussion of the reason an alternative is eliminated,[161] and courts have found that agencies are not obligated to perform in-depth analysis of rejected alternatives.[162] The level of analysis provided in the DEIS satisfies NEPA and supports the Commission's conclusion that the All Highway Alternative offers no significant advantage over the proposed route.

Several commenters argue that the Commission should adopt the Proposed Route as the preferred alternative because the Blue Ridge Variation does not offer a significant environmental advantage over the Proposed Route and would cause a greater impact to landowners.[163] PCGP does not believe that there is a compelling scientific reason to conclude that the Blue Ridge Variation offers significant environmental advantages over PCGP's Proposed Route[164] and agrees with commenters arguing that the final environmental impact statement ("EIS") should adopt PCGP's Proposed Route as the preferred alternative.

Some commenters raise questions about the DEIS's consideration of alternatives that avoid all federal lands or, at a minimum, avoid all Forest Service lands or cross Forest Service lands primarily along existing roads to reduce impacts on Late Successional Reserves ("LSR)."[165] The DEIS explains why an alternative route that avoids crossing federal lands is infeasible, particularly given the expansive landholdings by BLM and the Forest Service.[166] The DEIS also considers route variations that prioritize placement along existing roads within the national forests crossed by the Pipeline, including specific discussions of other considerations such as additional water-crossings and construction feasibility on or adjacent to steep sideslopes.[167] Furthermore, the DEIS correctly notes that PCGP has already adopted many route variations to place the construction corridor adjacent to existing roads,[168] many of which were included as PCGP modified its route between 2006 and 2014 to incorporate segments of an earlier "roads route" proposed by the Forest Service. The federal agencies also considered and eliminated other federal land avoidance alternatives that were not discussed in the DEIS. PCGP continues to work cooperatively with the federal land management agencies to respond to comments concerning those agencies' decisions as part of the NEPA process.

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[161] 40 C.F.R. § 1502.14.
[162] *See, e.g., Citizens for Smart Growth*, 669 F.3d at 1213.
[163] *See e.g.*, Comments of Ted Churchill, Accession No. 20190624-0023 at p. 1 (June 24, 2019) ("Ted Churchill Comments"); Comments of James Davenport, Accession No. 20190701-0016 at pp. 1-2 (July 1, 2019) ("James Davenport Comments").
[164] *See* Comments on the DEIS of JCEP and PCGP, Accession No. 20190705-5092 at Attachment A at 5-10 (July 5, 2019) ("Applicants' DEIS Comments").
[165] *See, e.g.*, Comments of Forest Service Employees for Environmental Ethics, Accession No. 20190705-5201 at pp. 1-2 (July 5, 2019) (Forest Service Employees Comments"); Comments of Klamath Siskiyou Wildlands Center, Accession No. 20190611-5150 at pp. 5, 9 (June 11, 2019) ("Klamath Siskiyou Wildlands Center Comments").
[166] DEIS at p. 3-16.
[167] *See, e.g.*, DEIS at pp. 3-31 to 3-34 (discussing Umpqua National Forest variations), pp. 3-34 to 3-37 and 3-41 to 3-45 (discussing Rogue River National Forest variations).
[168] *See* DEIS at p. 4-465.

F. **Cumulative Impacts**

Under NEPA, an agency's analysis must address cumulative impacts.[169] A cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions."[170] In evaluating cumulative impacts, the agency should consider: "1) the area in which the effects of the proposed project will be felt; 2) the impacts that are expected in that area from the proposed project; 3) other actions – past, present, and reasonably foreseeable – that have had or are expected to have impacts in the same area; 4) the impacts or expected impacts from these other actions; and 5) the overall impact that can be expected if the individual impacts are allowed to accumulate."[171] The DEIS appropriately analyzed cumulative impacts within the same affected environments as that where the direct and indirect effects of the Project may occur.

Generally, "[a]n impact is 'reasonably foreseeable if it is sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision."[172] NEPA does not, however, require that an agency consider "speculative" impacts.[173] In evaluating cumulative impacts, "NEPA does not require the government to do the impractical."[174] Environmental effects of actions that still could change substantially, may not occur, or that are too far in the future to be reasonably foreseeable are speculative. Indeed, the impacts of actions that are themselves still speculative cannot legitimately be evaluated, because the precise nature, scope and timing of such impacts are unknown. Evaluating the impacts of such actions would be little more than guesswork and would result in a meaningless analysis.[175]

Commenters have noted that the Commission must analyze the cumulative impacts of the Port Channel Modification Project.[176] Indeed, the Commission considered these impacts in detail in the DEIS. Table 4.14-2 in the DEIS provides a list of all projects, by watershed, that were included in the Cumulative Impacts analysis. These projects include maintenance dredging in the Port of Coos Bay, the Corps of Engineers Port of Coos Bay Jetties Rehabilitation Project, and numerous other renovation and improvement projects in the area.[177]

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[169] 40 C.F.R. § 1508.25(c).
[170] *Id.*at § 1508.7.
[171] *See Grand Canyon Trust v. Fed. Aviation Admin.*, 290 F.3d 339, 345 (D.C. Cir. 2002); *San Juan Citizens Alliance v. Stiles*, 654 F.3d 1038, 1056 (10th Cir. 2011); *Gulf Restoration Network v. United States. Dep't of Trans.* 452 F.3d 362, 368 (5th Cir. 2006).
[172] *City of Shoreacres v. Waterworth*, 420 F.3d 440, 453 (5th Cir. 2005)(*citing Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Cir. 1992)).
[173] *Id.*
[174] *Inland Empire Public Lands Council v. U.S. Forest Service*, 88 F.3d 754, 764 (9th Cir. 1996) (citing *Kleppe*, 427 U.S. at 414 (noting that "practical consideration of feasibility might well necessitate restricting the scope of comprehensive statements"); *Krichbaum v. Kelley*, 844 F. Supp. 1107, 1118 (W.D. Va. 1994)).
[175] *See Theodore Roosevelt Conservation P'ship v. Salazar*, 616 F.3d 497, 513 (D.C. Cir. 2010) (stating that a reasonably foreseeable action does not need to be finalized but must not be so preliminary as to make determining its cumulative impact meaningless).
[176] Comments of EPA Region 10, Accession No. 20190708-5022 at pp. 2, 8 (July 8, 2019) ("EPA Region 10 Comments") (out of time).
[177] DEIS at Table 4.14-2.

G. **Climate Change**

1. The Commission is not required to consider upstream greenhouse gas emissions as indirect effects of the Project.

Some commenters have asserted that greenhouse gas ("GHG") emissions associated with upstream development are indirect effects of the Project that must be considered in the EIS.[178] This is incorrect. Indirect effects are defined as those effects "which are *caused by the action* and are later in time or farther removed in distance, *but are still reasonably foreseeable*."[179] Courts have held that indirect effects include only those effects that are both reasonably foreseeable *and* sufficiently causally connected to the federal action at issue.[180] To be reasonably foreseeable, the effects must be "sufficiently likely to occur . . . that a person of ordinary prudence would take [them] into account in reaching a decision."[181] Further, agencies are not required "to engage in speculative analysis" or "to do the impractical, if not enough information is available to permit meaningful consideration."[182] With respect to the causal connection requirement, the Supreme Court has explained that "NEPA requires a reasonably close causal relationship between the environmental effect and the alleged cause," analogizing the requirement to the "familiar doctrine of proximate cause from tort law."[183] Accordingly, "a 'but for' causal relationship is insufficient to make an agency responsible for a particular effect under NEPA."[184]

Under this standard, GHG emissions resulting from upstream natural gas development are not indirect effects of the Project. With respect to causation, as the Commission has explained with respect to prior projects, "the environmental effects resulting from natural gas production are generally neither caused by a proposed pipeline project nor are they reasonably foreseeable consequences of [the Commission's] approval of an infrastructure project."[185] Commenters do not point to any evidence to the contrary, offering instead only the generalized argument that incremental pipeline capacity will necessarily lead to increased production.[186] But this ignores the fact that production is driven by "a number of factors, such as domestic natural gas prices and production costs . . ."[187] In fact, the Commission's approval of infrastructure projects such as pipelines is generally a *response* to an increase in production, rather than the cause of the same.[188] Indeed, "[i]t would make little economic sense to undertake construction of a pipeline in the hope that production might later be determined to be economically feasible and that the producers will choose the previously-constructed pipeline as best suited for moving their gas to the market."[189]

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[178] NRDC Comments at pp. 59, 61, 65.
[179] 40 C.F.R. § 1508.8(b) (emphasis added).
[180] *Freeport I* , 827 F.3d at 46-47; *City of Shoreacres*, 420 F.3d at 452.
[181] *Birckhead v. FERC*, 925 F.3d 510, 516-517 (D.C. Cir. 2019).
[182] *Northern Plains Resource Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1978 (9th Cir. 2011).
[183] *Dep't of Transp. v. Pub. Citizen*, 541 U.S. 752, 767 (2004).
[184] *Id*.
[185] *Tennessee Gas Pipeline Co., LLC*, 163 FERC ¶ 61,190 at P 59 (2018).
[186] *See, e.g.*, Comments of Institute for Policy Integrity, New York University School of Law with Environmental Defense Fund, Montana Environmental Law Center and Union of Concerned Scientists, Accession No. 20190705-5240 at Attachment A, Pipeline Approvals and Greenhouse Gas Emissions at p. 14. (July 5, 2019) ("Institute for Policy Integrity Comments") ("[A]pproval of a new transportation project reduces the costs of supplying . . .gas, . . .which increases . . . demand for gas, . . . which increases the amounts of gas that producers are willing to supply . . . .").
[187] *Id*.
[188] *Tennessee Gas Pipeline Co., LLC*, 156 FERC ¶ 61157 at P 68 (2016).
[189] *Id*.

Accordingly, a sufficient "causal relationship . . . would only exist if the proposed pipeline would transport new production from a specified production area and that production would not occur in the absence of the proposed pipeline (i.e., there will be no other way to move the gas)."[190] Commenters have not shown that such a relationship exists here.[191] Nor could they, as the PCGP will interconnect with two existing pipeline systems and will therefore transport gas from multiple regions, with significant uncertainty regarding the production areas that will supply the transported gas.[192]

With respect to foreseeability, the Commission has explained that it generally does not have "sufficient information to determine the origin of the gas that will be transported onto a pipeline," without which the Commission cannot "meaningfully predict production-related impacts."[193] To engage in any meaningful analysis, the Commission would require "information regarding the number, location, and timing of wells, roads, gathering lines, and other appurtenant facilities, as well as details about production methods, which can vary per producer and depending on the applicable regulations in the various states."[194]

While Commenters argue that the Commission could request this information from the Project Applicant,[195] such a request "would be an exercise in futility" because the Commission only has jurisdiction over the Project Applicant, who only contracts with shippers—to transport gas from delivery to the export facility—and not producers.[196] And even though shippers may contract with specific producers for their gas supply, the shippers do not have the requisite information. As the Commission has explained, "shippers would not know the source of the producer's gas, and, for that matter, producers are not required to dedicate supplies to a particular shipper and thus likely will not know in advance the exact source of production."[197] In short, the impacts of upstream production are "so nebulous that [the Commission] cannot forecast their likely effects."[198]

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[190] *Tennessee Gas Pipeline Co.*, 163 FERC ¶ 61,190 at P 68; *see also Birckhead*, 925 F.3d at 516-517 (D.C. Cir. 2019). (holding that Commission did not violate NEPA in declining to consider upstream production impacts where petitioners failed to show that the only way to move the gas was the challenged pipeline).

[191] *See, e.g.*, NRDC Comments at pp. 59, 61, 65; Institute for Policy Integrity Comments at Attachment A: Pipeline Approvals and Greenhouse Gas Emissions 14, 28-31.

[192] *See* DEIS at p. 1-1.

[193] *Tennessee Gas Pipeline Co.*, 163 FERC ¶ 61,190 at P 60.

[194] *Id.* at P 60 n. 142.

[195] NRDC Comments at p. 68; Institute for Policy Integrity Comments, Attachment A: Pipeline Approvals and Greenhouse Gas Emissions at p. 14 ("FERC must request all relevant information from project proponents before claiming such information is unavailable").

[196] *See Tennessee Gas Pipeline Co.*, 163 FERC ¶ 61,190 at P 60.

[197] *Id.*

[198] *Id.* Commenters further assert that NEPA "requires the Commission to at least attempt to obtain the information necessary to fulfill its statutory responsibilities." NRDC Comments at p. 68 (citing *Birckhead*, 925 F.3d at 521). But "NEPA does not require the impossible." *Jicarilla Apache Tribe of Indians v. Morton*, 471 F.2d 1275, 1280 n. 11 (9th Cir. 1973). And, as the Commission has pointed out in past orders, "[n]ot even the states, which have jurisdiction over the production of natural gas, would have information regarding where (other than in a general region) gas that will be delivered into a particular new pipeline will be produced, or whether the gas will come from existing or new wells." *Tennessee Gas Pipeline Co.*, 163 FERC ¶ 61,190 at P 60 n. 140.

2. Neither FERC nor DOE is required to calculate downstream GHG emissions as indirect effects of the Project.

A few commenters assert that the DEIS is deficient because it fails to quantify the downstream GHG emissions that result from the consumption of exported natural gas as indirect effects of the Project.[199]

This argument misunderstands the Commission's obligations under NEPA, which only requires the Commission to analyze impacts that are sufficiently causally related to the Project.[200] As the Supreme Court explained in *Department of Transportation v. Public Citizen*, this requirement ensures that agencies only analyze information that is useful to the agency's decision-making process.[201] When agencies "have no ability to prevent a certain effect due to its limited statutory authority over the relevant actions," considering such effects "can have no impact on [the agency's] decision-making."[202] Accordingly, in such circumstances, "the agency cannot be considered a legally relevant cause of the effect" and the agency is not required to include the effect in its NEPA analysis.[203]

Applying this principle to LNG export facilities, the D.C. Circuit held in *Freeport I* that the Commission is not required to address indirect effects of the anticipated export of natural gas, including greenhouse gas emissions, when permitting LNG export facilities under the Natural Gas Act.[204] The court explained that it is "the Department of Energy, not the Commission, [that] has sole authority to license the export of . . . natural gas" in such circumstances.[205] This "independent decision to allow exports—a decision over which the Commission has no regulatory authority—[therefore] breaks the NEPA causal chain . . . ."[206] While the D.C. Circuit's decision in *Freeport I* concerned the Commission's permitting of an LNG export facility, the same reasoning applies to the Project in this instance because, except for the small amount of gas burned onsite at the LNG Terminal and at the Pipeline's compressor stations, all of the gas transported by the Pipeline will be exported through the LNG Terminal.[207] Accordingly, for practical purposes, the Pipeline's downstream GHG emissions are the same as the LNG Terminal's downstream GHG emissions.

Commenters' reliance on the D.C. Circuit's decision in *Sierra Club v. FERC* ("*Sabal Trail*") is misguided.[208] In that case, the D.C. Circuit held that the Commission did not provide a satisfactory explanation for not quantifying greenhouse gas emissions downstream of the Sabal

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[199] NRDC Comments at pp. 58, 64; Institute for Policy Integrity Comments, Attachment A: Pipeline Approvals and Greenhouse Gas Emissions 12-19.
[200] *See* text, *supra*, accompanying notes 183-184.
[201] 541 U.S. at 768-679.
[202] *Id.* at 769-770.
[203] *Id.*
[204] 827 F.3d at 47.
[205] *Id.*
[206] *Id.* at 48; *accord EarthReports, Inc.*, 828 F.3d at 955-96; *Sierra Club v. FERC*, 827 F.3d 59, 68-69 (D.C. Cir. 2016).
[207] The Institute for Policy Integrity questions whether this is the case, noting that "the DEIS does not specify that all natural gas transported by the pipeline will ultimately be exported through the LNG terminal." Institute for Policy Integrity Comments at p. 4. This concern is misplaced. JCEP's Application filed with the Commission repeatedly states that the natural gas delivered to the LNG Terminal is for export, and no other interconnection points or off-takers are present. *See* JCEP LNG Terminal Application at 2-3, 13-16.
[208] NRDC Comments at pp. 58, 64-65 (citing *Sabal Trail*, 867 F.3d 1357, 1371-74 (D.C. Cir. 2017)); Institute for Policy Integrity Comments at Attachment A: Pipeline Approvals and Greenhouse Gas Emissions 14-15 (same).

Trail gas pipeline.[209] That case is inapposite. Unlike here, where DOE's regulatory authority "breaks the NEPA causal chain," the D.C. Circuit held that the Commission was the "legally relevant cause of the direct and indirect environmental effects" of the Sabal Trail pipeline.[210] Indeed, the court explicitly distinguished *Sabal Trail* from cases involving LNG export facilities, where "FERC ha[s] no legal authority to consider the environmental effects of those exports, and thus no NEPA obligation stemming from those effects."[211]

Commenters argue in the alternative that DOE is required to quantify the specific downstream GHG emissions that would result from the LNG Terminal's exported gas.[212] This argument is equally misplaced because such emissions are unforeseeable for two reasons: (1) there is substantial uncertainty regarding which countries will receive the gas and (2) there is substantial uncertainty regarding the extent to which importing countries might use the gas as a substitute for other energy resources.[213] As the DEIS notes, the project "is a market-driven response to . . . growth of *international* demand,"[214] and while the DEIS further states that the project is responding to demand "particularly in Asia,"[215] that region is composed of numerous countries, each of which has its own fuel mix.

Moreover, any NEPA obligation that DOE may have to analyze downstream GHG emissions is satisfied by two existing DOE reports. The first of these is titled *Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States* ("Life Cycle Report") and "assesses the life cycle—from the wellhead to power plant—of green-house gas emissions associated with electricity generated using U.S. [natural gas] in Europe or Asia, and compares these with emissions from electricity generated from coal or other sources of gas."[216] The second is the *Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States* ("Addendum"), which examines historical and projected estimates of nationwide GHG emissions from natural gas production in the United States.[217] FERC should ensure these studies are incorporated by reference into the final EIS, as DOE apparently intends to rely on FERC's NEPA analysis, as is normally the case with LNG export projects.

As the D.C. Circuit explained in *Freeport II*, these reports satisfy DOE's NEPA obligations where, as here, "the dynamics of [the] energy markets" of the receiving countries are uncertain.[218] In that case, Sierra Club argued that DOE violated NEPA by not sufficiently examining the downstream GHG emissions from burning exported LNG.[219] The D.C. Circuit disagreed, finding that the 2014 Life Cycle Report and Addendum satisfied DOE's NEPA obligations.[220] In so holding, the D.C. Circuit concluded that DOE had reasonably explained that it would be unduly speculative to attempt to model the precise effects that LNG exports from Freeport's terminal

[209] *Sabal Trail*, 867 F.3d at 1374.
[210] *Id.* at 1372.
[211] *Id*.
[212] NRDC Comments at p. 60.
[213] *Sierra Club v. U.S. Dep't of Energy*, 867 F.3d at 202 ("Freeport II").
[214] DEIS at p. 1-6 (emphasis added).
[215] *Id*.
[216] *Freeport II.* 867 F.3d at 195-96.
[217] *Id*.
[218] *Id.* at 201.
[219] *Id.*
[220] *Id.*

would have on net global GHG emissions.[221] To conduct such modeling DOE would have had to project how U.S. natural gas would compete with numerous other potential fuel sources "in each potential LNG-importing nation."[222] And to make such projections, DOE would have had to model "the dynamics of all energy markets in LNG-importing nations," a highly "uncertain[]" task.[223] Accordingly, the D.C. Circuit upheld the DOE's conclusion that such analysis would be "too speculative to inform the public interest determination."[224]

3. The Commission adequately considered the Project's cumulative impacts on climate change.

Some commenters argue that the Commission's cumulative impacts analysis is deficient because it failed to consider the cumulative impacts of upstream and downstream emissions associated with the Project, together with the emissions associated with other oil and gas development on a national scale.[225] One commenter also took issue with the Commission's analysis of cumulative impacts on climate resulting from the GHG emissions associated with the construction and operation of the LNG Terminal, asserting that the DEIS "fails to . . . evaluate[] the significance of the climate impacts associated with these direct emissions."[226] Both arguments are incorrect.

NEPA requires agencies to evaluate the cumulative impacts on the environment that result from "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency . . . or person undertakes such other actions."[227] To accomplish this task, an agency must identify "the overall impact that can be expected" if impacts are allowed to accumulate from the Project and other actions that are "past, present, and . . . *reasonably foreseeable* that have had or are expected to have impacts *in the same area*."[228] To provide further guidance on this task, CEQ has advised that "it is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful."[229] Further, a cumulative impacts analysis need only include "such information as appears to be reasonably necessary under the circumstances for

[221] *Id.* at 202.
[222] *Id.*
[223] *Id.*
[224] *Id.*
[225] NRDC Comments at p. 58 ("[T]he Commission takes the unlawful position that the . . . cumulative impacts of the production, transportation to and from the LNG terminal, and end use of the gas . . . are 'out of scope' of its NEPA analysis."); Comments of Southern Oregon Climate Action Now, Accession No. 20190705-5038, at p. 2. ("SOCAN Comments"); *cf.* League of Women Voters Comments at p. 112 (implying that the cumulative impacts analysis was deficient where it discussed climate change impacts in the Project Area).
[226] NRDC Comments at p. 59.
[227] 40 C.F.R. § 1508.7.
[228] *TOMAC v. Norton*, 433 F.3d 852, 864 (D.C. Cir. 2006) (emphasis added) (quoting *Grand Canyon Trust.*, 290 F.3d at 345); *Gulf Restoration Network v. United States Dept. of Transp.*, 452 F.3d 362, 368 (5th Cir. 2006) ("Gulf Restoration Network").
[229] CEQ, *Considering Cumulative Effects Under the National Environmental Policy Act* at p. 8 (January 1997), https://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-ConsidCumulEffects.pdf, (1997 CEQ Guidance).

evaluation of the project rather than to be so all-encompassing in scope that the task of preparing it would become either fruitless or well-nigh impossible."[230]

Relevant here, the Commission need not include impacts from upstream production or downstream consumption as part of its cumulative impacts analysis because those impacts are not reasonably foreseeable, as explained above.[231] And the Commission has consistently concluded "that where the Commission lacks meaningful information about potential future natural gas production within the geographic scope of a project-affected resource, . . . production-related impacts are not reasonably foreseeable so as to be included in a cumulative impacts analysis."[232] Commenters' suggestion that the Commission is required to analyze the cumulative impacts of upstream and downstream emissions is therefore misplaced.

Similarly misplaced is the argument that the Commission failed to analyze the cumulative impacts from GHG emissions associated with the Project's construction and operation. The DEIS quantified the Project's direct GHG emissions, noted that such emissions "would contribute incrementally to future climate change impacts," and discussed the "projection of climate change impacts in the Project region."[233] It further explained that "there is no universally accepted methodology to attribute discrete, quantifiable, physical effects on the environment to the Project's incremental contribution to GHGs."[234] Attempting to do so would therefore be "fruitless or well-nigh impossible."[235]

4. The Commission is not required to use the Social Cost of Carbon.

In addition to quantifying emissions, some commenters argue that the Commission must also monetize the costs of estimated emissions using the Social Cost of Carbon ("SCC") tool, which is used to "estimate[] the monetized climate change damage associated with an incremental increase in CO2 emissions in a given year."[236] Specifically, commenters assert that the SCC would facilitate a more meaningful cumulative impacts analysis,[237] and that without its use, decisionmakers will underestimate an individual project's contribution to climate change.[238] In the commenters' view, this problem is best resolved by using the SCC to contextualize climate change impacts by demonstrating the Project's relative significance.[239] Further, commenters contend that such an analysis is required under NEPA.[240] This is incorrect.

As the Commission has explained in recent orders, neither NEPA nor its implementing regulations require agencies to conduct a monetary cost-benefit analysis when weighing

[230] *NRDC v. Callaway*, 524 F.2d 79, 88 (2d Cir. 1975).
[231] *See* text, *supra*, accompanying notes 185-197 and 213-215.
[232] *Tennessee Gas Pipeline Co.*, 163 FERC ¶ 61,190 at P 52; *Algonquin Gas Transmission, LLC*, 161 FERC ¶ 61,255 at P 120 (2017).
[233] DEIS at p. 4-806.
[234] *Id.*
[235] *See NRDC v. Callaway*, 524 F.2d at 88.
[236] *Florida Southeast Connection, LLC*, 162 FERC ¶ 61,233, at P 30 (2018).
[237] NRDC Comments at p. 59; Institute for Policy Integrity Comments at p. 12 (the SCC "enables agencies to assess whether [climate] impacts are cumulatively significant").
[238] *See, e.g.*, Institute for Policy Integrity Comments at p. 7; *cf.* SOCAN Comments at p. 8.
[239] *Id.*
[240] *See generally* Institute for Policy Integrity Comments; NRDC Comments at pp. 74-76.

alternatives under NEPA.[241] Indeed, CEQ regulations provide that "weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are more important considerations."[242] Consistent with this provision, recent draft guidance issued by the CEQ advises that "an agency need not weigh the effects of the various alternatives . . . in a monetary cost-benefit analysis using any monetized [SCC] estimates . . . or other similar cost metrics."[243]

Moreover, as the Commission has clearly demonstrated in recent orders,[244] and as the D.C. Circuit has affirmed,[245] the SCC is not an appropriate tool for project-level environmental review under NEPA. Although the SCC "may be useful for rulemakings or comparing regulatory alternatives using cost-benefit analyses where the same discount rate is consistently applied," "it is not appropriate for estimating a specific project's impacts or informing [the Commission's] analysis under NEPA."[246]

For these reasons, the Commission reasonably concluded that using the SCC would not meaningfully add to its analysis, and instead analyzed GHG emissions by (1) quantifying the emissions associated with the construction and operation of the Project and (2) contextualizing those emissions by providing a qualitative discussion of how GHG emissions induce global climate change, among other things.[247] This discussion more than satisfies the Commission's NEPA obligations to discuss the Project's impacts.[248]

Commenters nevertheless cite to various cases to assert that the Commission is required to monetize the costs of climate change via the SCC,[249] including the District of Colorado's 2014 decision in *High Country Conservation Advocates v. United States Forest Service* ("High Country")[250] and the District of Montana's 2017 decision in *Montana Environmental Information Center v. U.S. Office of Surface Mining* ("Montana Environmental Information Center").[251] Commenters' reliance on these cases is misplaced, as they are both distinguishable from the Commission's review of the Project. Indeed, both cases stand for the proposition that failing to

[241] *Florida Southeast Connection, LLC*, 164 FERC ¶ 61,099 at P 27 (2018).
[242] 40 C.F.R. § 1502.23.
[243] CEQ, *Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions*, 84 Fed. Reg. 30097, 30098-30099 (2019) ("CEQ Draft GHG Guidance").
[244] *See, e.g., Florida Southeast Connection, LLC*, 162 FERC 61233 at PP 30-51 (2018).
[245] *EarthReports, Inc.*, 828 F.3d at 956 (D.C. Cir. 2016) (upholding the Commission's conclusion that the SCC was not "an appropriate or informative" tool).
[246] *Id.*; *see also* CEQ Draft GHG Guidance at 30099 ("SCC estimates were developed for rulemaking purposes to assist agencies in evaluating the costs and benefits of regulatory actions, and were not intended for socio-economic analysis under NEPA or decision-making on individual actions, including project-level decisions.").
[247] DEIS at pp. 4-804 to 4-807. The DEIS also discusses projected climate change impacts in the Project region, as well as Oregon's GHG reduction goals. *Id.*
[248] *See* text, *supra*, accompanying notes 221-230; *see also League of Wilderness Defenders-Blue Mountains Biodiversity Project*, 689 F.3d at 1076 ("[Q]ualitative analyses are acceptable in an [environmental document] where an agency explains 'why objective data cannot be provided.'").
[249] NRDC Comments at pp. 75-76; Institute for Policy Integrity Comments at pp. 9-10.
[250] 52 F.Supp.3d 1174, 1191-93 (D. Colo. 2014).
[251] 274 F.Supp.3d 1074, 1094-99 (D. Mont. 2017).

monetize the costs of GHG emissions is arbitrary and capricious where an agency quantifies and expressly relies on the anticipated economic benefits of a project in justifying its approval.[252]

Here, the Commission has not conducted an imbalanced cost-benefit analysis for the purpose of informing its comparison of alternatives.[253] Commenters attempt to assert the contrary—*i.e.*, that the Commission has in fact conducted an imbalanced cost-benefit analysis—because the DEIS discusses certain socioeconomic benefits (e.g., employment and tax revenues).[254] But this argument mischaracterizes the Commission's review. As the Commission has explained with respect to prior similar projects, discussion of certain direct socioeconomic benefits, such as tax revenues, in units of dollars does not constitute a cost-benefit analysis. Rather, such benefits are discussed in dollars because they "*occur* in units of dollars and are directly comprehensible in units of dollars."[255] Discussion of those benefits on their own, however, does not form part of a broader cost-benefit analysis that is intended to "inform the Commission staff's comparison of alternatives, choices of mitigation measures, or determination about the significance of the [Project's] environmental impacts."[256]

Further, to accomplish such a cost-benefit analysis, the Commission would "not only need to quantify all of the negative impacts of the project, but . . . also [all of] the project's benefits, including, but not limited to, replacement of [other fuels] by natural gas, a task no easier than calculating costs."[257] That is, the Commission does not attempt to monetize the "social cost of visual impacts," the "social cost of wildlife impacts," or—crucially—the "social cost" of *foregoing* the numerous benefits of the Project, such as increasing access to affordable energy. Without such information, or knowing what existing or future energy projects in importing regions would be offset as a result of exported gas, using the SCC would merely lead to misleading results. Putting aside the scientific uncertainty of doing so, attempting to monetize one particular type of impact without doing so for all impacts and benefits of the Project would inappropriately overemphasize one specific effect above all others. In light of such realities, and "because siting infrastructure necessarily involves making qualitative judgments between different resources as to which there is no agreed-upon quantitative value,"[258] the Commission has reasonably decided not to conduct a monetary cost-benefit analysis of all the impacts and benefits of the Project. NEPA does not require otherwise.

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[252] *High Country Conservation Advocates*, 52 F.Supp.3d at 1191 ("Even though NEPA does not require a cost-benefit analysis, it was nonetheless arbitrary and capricious to quantify the *benefits* of the lease modifications and then explain that a similar analysis of the *costs* was impossible when such an analysis was in fact possible," especially when "the agencies expressly relied on the anticipated economic benefits . . . in justifying their approval."); *Montana Envt'l Info. Ctr.*, 274 F.Supp.2d at 1096 ("it was arbitrary and capricious for the [agency] to quantify socioeconomic benefits while failing to quantify costs").

[253] *See generally* DEIS.

[254] Institute for Policy Integrity Comments at p. 10 (citing DEIS at p. 4-593 (noting that the DEIS reported $7.3 billion in output and $1.2 billion in labor income for the construction period).

[255] *Florida Southeast Connection, LLC*, 162 FERC ¶ 61,233 at P 40.

[256] *See id.*

[257] *Id.* at P 41.

[258] *Id.* at P 40.

5. The Commission has adequately analyzed the Project's impact on Oregon's GHG Reduction Goals.

One commenter suggests that the Commission should expand on its analysis of the Project's impact on Oregon's GHG reduction goals.[259] To the extent this commenter suggests that the DEIS's analysis is inadequate, this is incorrect. The DEIS correctly takes note of Oregon's GHG reduction goals, which set a state-wide target of 51 million metric tons of carbon dioxide equivalent by 2020, and 14 million metric tons by 2050.[260] The DEIS also notes that the Project "would represent 4.2 percent and 15.3 percent of Oregon's 2020 and 2050 GHG goals, respectively."[261] The commenter acknowledged and "appreciate[d]" this analysis, but "recommend[ed] the FEIS discuss how the project would affect the ability of the State of Oregon to meet its stated carbon dioxide / GHG emissions reduction targets."[262]

The Commission is not required to conduct this analysis under NEPA, which does not require agencies "to engage in speculative analysis" or "to do the impractical, if not enough information is available to permit meaningful consideration."[263] It is up to Oregon, not the Commission, to determine how it will attempt to meet its GHG reduction goals in the future, and at this point there is no specific plan for doing so. As a result, the Commission does not have sufficient information to "meaningful[ly]" assess how the Project may affect Oregon's ability to meet its reduction goals. The Commission disclosed in the DEIS the reasonably foreseeable GHG impacts of the Project in Oregon, as well as Oregon's future reduction targets. NEPA requires no more.

6. The Commission was not required to use the 20-year Global Warming Potential for Methane.

One commenter incorrectly asserts that the Commission unlawfully ignored scientific evidence regarding the climate impacts of methane. Specifically, this commenter asserts that the Commission unlawfully chose to use the 100-year global warming potential ("GWP") instead of using a 20-year GWP.[264] This argument is misplaced.

In recent orders involving other natural gas projects, the Commission has correctly rejected requests to use a 20-year GWP, noting that the 100-year GWP has been and currently is used by EPA in its official GHG inventories, as well as in its mandatory GHG emission reporting program.[265] As the EPA has explained in its rulemakings, the 100-year timeframe is the internationally accepted standard for reporting GHG emissions.[266] It is therefore "beneficial for both regulatory agencies and industry to use the same GWP values" in part because it "reduces potential errors . . . when comparing multiple data sets."[267] Accordingly, the use of the 100-year

[259] EPA Region 10 Comments at pp. 8-9.
[260] DEIS at p. 4-807.
[261] *Id.*
[262] EPA Region 10 Comments at p. 9.
[263] *Northern Plains Resource Council, Inc.*, 668 F.3d at 1078.
[264] NRDC Comments at pp. 83-86.
[265] *E.g.*, *PennEast Pipeline Co.*, 162 FERC ¶ 61,053 at P 206 (2018).
[266] EPA, 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantially Revised Data Elements – Final Rule, 78 Fed. Reg. 71903, 71914 (Jan. 1, 2014).
[267] *Id.*

GWP in the DEIS "allows for a consistent comparison with these regulatory requirements."[268] The Commission has therefore provided a reasonable explanation for its choice between "competing methodologies"—an issue on which agencies receive deference, "especially when the issue involves a technical judgment within an agency's expertise."[269] Indeed, other agencies' use of the 100 year GWP for methane has been upheld by reviewing courts on the same rationale.[270]

H. **Mitigation**

Certain commenters suggest that the DEIS is inadequate because it includes mitigation measures that rely on information that will be provided in the future, and assert that this information is necessary to evaluate the effectiveness of mitigation measures.[271] Some commenters also expressed concern that the DEIS incorporates mitigation measures that are still in development and, thus, cannot be assessed for effectiveness.[272] The submission of information such as increasingly refined mitigation plans after the close of the DEIS comment period or later is consistent with NEPA and federal agencies' practices in conducting environmental reviews and does not render an otherwise sufficient DEIS inadequate. To the extent such information varies from that in the DEIS, the changes are usually minor in nature and do not significantly change the environmental analysis in the DEIS. If relevant changes or new information becomes available after conclusion of the NEPA process, the CEQ regulations identify when supplemental or additional NEPA analyses are required.[273]

While NEPA expressly requires discussion of possible mitigation measures as part of an EIS, it does not require that all such plans "be actually formulated and adopted," and a final EIS need not include a complete mitigation plan.[274] Providing a conceptual discussion of mitigation plans in an EIS with a commitment to finalize such plans to meet specific goals has been held to satisfy NEPA.[275] The mitigation that has been proposed by the Commission and the Applicants, and which was identified in the DEIS, complies with, or exceeds, this standard.

Further, the provision of additionally detailed mitigation information at various points in the review process (including from the end of the comment period to prior to the construction of a particular segment of pipeline) is not uncommon.[276] As mitigation plans become more detailed,

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[268] DEIS at p. 4-666 n. 186.
[269] *Wilderness Workshop v. Bureau of Land Mgmt.*, 342 F.Supp.3d 1145, 1160-1161 (D. Colo. 2018).
[270] *Id.* at 1160 (upholding BLM's decision to use the 100 year GWP for methane because it was used by "EPA . . . in rules and regulations.").
[271] WELC Comments at p. 138.
[272] *Id.*; League of Women Voters Comments at pp. 15-16.
[273] 40 C.F.R. § 1502.9(c).
[274] *Methow Valley Citizens Council*, 490 U.S. at 352-53 ("There is a fundamental distinction . . . between a requirement that mitigation be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated . . . and a substantive requirement that a complete mitigation plan be actually formulated and adopted" and, in reversing the Ninth Circuit, held that there is no NEPA requirement to include in every EIS "a detailed explanation of specific measures which will be employed to mitigate the adverse impacts."); *Marsh v. Oregon Natural Res. Council*, 490 U.S. at 369 (holding that NEPA does not require an final EIS to include a complete mitigation plan).
[275] *Methow Valley Citizens Council*, 490 U.S. at 352-353 ("[I]t would be inconsistent with NEPA's reliance on procedural mechanisms—as opposed to substantive, result-based standards—to demand the presence of a fully developed plan that will mitigate environmental harm before an agency can act.").
[276] *See, e.g.*, Draft Environmental Impact Statement for Algonquin Gas Transmission, LLC's Algonquin Incremental Market Project, Accession No. 20140806-4001 at Section 5.2 (Aug. 6, 2014) (recommending that prior to

this information can be included in the final EIS. The additional mitigation information does not constitute a substantial change to the proposed action, a significant new circumstance, or other information relevant to environmental concerns bearing on the proposed action or its impacts. Because the details of site-specific mitigation plans cannot be finalized until engineering designs and construction documents are further developed, and because certain aspects of mitigation are subject to review and approval by state or federal agencies other than the lead agency, the development and refinement of specific mitigation plans often take place after the completion of the DEIS and in some cases after the completion of the final EIS. This is particularly common when final mitigation plans must be informed by site-specific surveys and information for properties where access has not been granted and will not be granted until following issuance of the FERC certificate order.

One commenter expressed concern that mitigation measures had not yet been developed for private lands and, subsequently, their effectiveness could not be assessed based on the DEIS.[277] Although Applicants are continuing to develop mitigation plans for private lands, the DEIS conceptually discusses mitigation options for private lands.[278] Specifically, the DEIS explains that mitigation for private lands will include the Compensatory Mitigation Plan for wetland impacts and avoidance and minimization plans included in the Applicants' Plan of Development documents, drafts of which were included as exhibits to the DEIS.

The same commenter also expressed concern that the DEIS shifts responsibility for enforcement of mitigation measures on private properties to landowners, and argues that this should be FERC's responsibility.[279] This comment misunderstands FERC's role, as all FERC-jurisdictional work undertaken by the Applicants, regardless of whether on federal, state, or private land, is subject to potential enforcement by FERC for non-compliance. Specifically, the commenter expressed this concern with respect to the Landowner Complaint Resolution Procedure that PCGP would implement. As the DEIS indicates, this procedure is merely one component of PCGP's measures designed to mitigate risks and impacts on private properties. PCGP would also install safety fencing during construction; schedule construction activities with sensitivity to landowners' quiet enjoyment needs and recreation practices; comply with noise ordinances; manage traffic flow and ensure that increased traffic will not impede emergency response activities; utilize dust minimization techniques; preserve trees to the extent possible and

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construction, Algonquin file site-specific crossing plans incorporating any additional avoidance or mitigation measures for certain vernal pools, state park resources, certain rattlesnake habitat, as well as a final Compensatory Mitigation Plan developed with USACE and other agencies); Draft Environmental Impact Statement for the Freeport LNG Liquefaction Project and Phase II Modification Project, Accession No. 20140314-4002 at Section 5.15. (Mar. 14, 2014) (recommending that prior to construction, Freeport LNG file a Construction Noise Mitigation Plan); Draft Environmental Impact Statement re the Rockaway Delivery Lateral Project, Accession No. 20131004-4003 at Section 5.2 (Oct. 4, 2013) (recommending that prior to construction, Transco file a site-specific noise mitigation plan for an HDD location and plans for implementing mitigation measures to address listed species); Draft Environmental Impact Statement re the New Jersey-New York Expansion Project, Accession No. 20110907-4002 at Section 5.2 (Sept. 9, 2011) (recommending that prior to construction, Applicants file a Dust Control Plan specifying mitigation measures to abate dust, and noise mitigation plans,); Draft Environmental Impact Statement re the Bison Pipeline Project, Accession No. 20090821-0201 at Section 5.2 (Aug. 21, 2009) (recommending that prior to construction, Bison file studies and plans related to mitigation measures related to windbreaks, powerline interference, and recreational use of a specified river).

[277] Snattlerake Comments at p. 19.

[278] DEIS at p. 2-36.

[279] Snattlerake Comments at pp. 19-20.

compensate landowners for removed trees; restore landscaping immediately after the trench is filled; provide alternate sewer facilities if construction impacts a landowner's septic system and repair damage to septic systems; and compensate landowners for damage to homes.[280] Together, these measures represent a comprehensive mitigation scheme for which the burden is on PCGP, not the landowner. The Complaint Resolution Procedure, rather than shifting the burden for enforcement issues, provides a mechanism to ease landowners' burden with respect to such disputes and merely supplements PCGP's comprehensive mitigation regime.

Another commenter stated a concern regarding delaying the HAZOP analysis until after the design is completed.[281] However, as the DEIS indicates, a HAZOP analysis was conducted when developing the front-end engineering design and is discussed in detail in the DEIS.[282] To be sure, the DEIS also notes that a more detailed HAZOP analysis will be completed during the final design.[283] The HAZOP analysis is a component of the design process and, thus, its completion during the design phase is inevitable. To the extent the more detailed HAZOP analysis results in recommendations different from those in the DEIS, FERC staff will review and approve those recommendations, as recommended in the DEIS.[284] The design development team will incorporate the recommendations into the design, construction, and other components of the project as needed, and Applicants will evaluate such changes to ensure that resultant safety, health, and environmental risks are adequately addressed. And, to the extent such changes are significant, the DEIS acknowledges that "major modifications could require an amendment or new proceeding."

The same commenter also correctly noted that discussion of mitigation in a DEIS is not a substitute for fully addressing the impacts of the proposed project.[285] NEPA contains no action-forcing provisions and does not require any mitigation be implemented at all,[286] much less a requirement that all impacts be fully mitigated. The DEIS adequately discusses each category of impact in addition to discussing respective mitigation measures and, thus, complies with NEPA's procedural requirements.

III. *NGA Comments*

A. Public Benefit and Market Need

A number of comments on the DEIS question whether the DEIS, or the market support provided by JCEP and PCGP, shows sufficient public benefits for the Project. As an initial matter, the DEIS is intended to analyze the potential environmental effects of the proposed action, not to evaluate whether JCEP meets the standard under NGA Section 3 or PCGP meets the standard under NGA Section 7 to receive an authorization from FERC. In its order in these proceedings, the Commission will apply the appropriate statutory standards to the evidence and determine whether to grant the requested authorizations.

[280] DEIS at pp. 4-420 to 4-421.
[281] WELC Comments at p. 17.
[282] DEIS at p. 4-717.
[283] DEIS at p. 4-717.
[284] DEIS at pp. 7-718 to 7-759.
[285] WELC Comments at p. 17.
[286] *Methow Valley Citizens*, 490 U.S. at 352-353.

Under NGA Section 3, the Commission should approve the LNG Terminal "unless, after the opportunity for hearing, it finds that the proposed exportation or importation will not be consistent with the public interest."[287] NGA Section 3, then, contains a presumption that LNG terminals are in the public interest.[288] NGA Section 3 contains this presumption because Congress has recognized that exports and imports of natural gas are in the public interest, contrary to the claims of some commenters.[289] As discussed below, the LNG Terminal will provide numerous public benefits in the form of job creation, investment in infrastructure, tax payments, and port modernization, all as detailed in these proceedings.

JCEP and PCGP have provided significant evidence of the need for and benefits of the LNG Terminal and Pipeline to meet the applicable statutory standards. Economic benefits to the Project area are addressed in Section 4.9 of the DEIS. Additionally, JCEP's Resource Report 1, Section 1.2.2, details the numerous benefits of the Project to the Oregon economy, including $9.8 billion spent constructing the Project, with approximately $2.88 billion to be spent directly at Oregon businesses. Furthermore, the Project will directly pay Oregon resident workers about $1.5 billion in compensation. Non-residents working on the Project's construction and paying income taxes to Oregon will earn about $650 million in labor compensation. Statewide, 43,233 full-year equivalents ("FYEs") would be supported by construction of the Project. Wages, salaries, and benefits for those 43,233 FYEs will total almost $3.4 billion. During operations, 200 workers will be directly employed in Oregon for the LNG Terminal and offices in Coos Bay and Portland. Total labor compensation in 2024 for the LNG Terminal and offices will be about $44.8 million.

Economic benefits will arise from both Project spending and the spending of the Project's construction workers and staff. The LNG Terminal, supporting marine operations and the Portland office will spend $67.0 million, $29.2 million, and $2.8 million a year, respectively, for goods and services from Oregon suppliers, for a total of $99.1 million. In 2024, PCGP will employ 15 workers in Oregon and spend $3.1 million on wages, benefits, and other employee compensation costs. Purchases of goods and services from Oregon businesses for the Pipeline will total about $8.7 million in 2024. Through JCEP's and PCGP's annual purchases of goods and services from Oregon businesses and household spending by employees, the Project will support an additional 1,567 jobs in Oregon, $95.8 million in additional labor income, and $235.2 million in additional output for Oregon businesses.

The Project also represents additional investment in and modernization for the Port of Coos Bay, which was once the largest timber port in the world but has seen utilization and investment steadily decline over time. JCEP would directly invest in improving marine-related infrastructure and capability, such as the procurement of four state-of-the-art tractor tugs with firefighting

[287] 15 U.S.C. § 717(b)(a).
[288] *Cf. Sierra Club v. U.S. Dep't of Energy*, 867 F.3d at 203.
[289] *See, e.g.*, Comments of Susan Lee, Accession No. 20190415-5005 at p. 1 (Apr. 15, 2019) ("Susan Lee Comments"); Comments of John and Becky Schenck, Accession No. 20190416-5001 at p. 1 (Apr. 16, 2019) ("John Schenck Comments") (asserting a foreign company should not be able to build a large pipeline through Oregon to export to foreign markets); Comments of Robert and Linda Fleming, Accession No. 20190423-0044 at p. 1 (Apr. 23, 2019) ("Robert Fleming Comments"); Comments of Shannon Mangan, Accession No. 20190513-0013 at pp. 1-2 (May 13, 2019) ("Shannon Mangan Comments").

capabilities, active ship escort and emergency towing and rescue capability, and procurement and set up of a private vessel traffic information system.

The Project will contribute to the fiscal health of local communities through property taxes and through a local Community Enhancement Plan ("CEP") in Coos County. For PCGP, property taxes are anticipated to average approximately $20.0 million a year for school districts and other local districts to be shared between Coos, Douglas, Jackson, and Klamath counties. For JCEP, the cities of Coos Bay and North Bend, along with Coos County and the Port of Coos Bay, will oversee a community fund to implement the CEP. Under the CEP, property tax benefits available at the site would be returned to the County, local communities, and the Port of Coos Bay under a formula that accelerates payments at the start of construction and levels payments from the commencement of operations for 15 years amounting to more than $500 million in payments.

None of the project opponents have presented evidence sufficient to overcome the presumption in favor of authorizing the LNG Terminal, together with the benefits the LNG Terminal will provide. Moreover, comments related to the need for the Project within the world LNG market or about the future need for the LNG Terminal in Oregon are irrelevant to these proceedings.[290] FERC is not responsible for authorizing exports of natural gas, only for LNG terminal facilities. FERC does not analyze the market need for LNG terminals for a number of reasons. First, world LNG markets are not FERC's area of expertise. Second, JCEP is at risk for its full costs of constructing and operating the LNG Terminal; it has no captive ratepayers who could be made to bear the costs of unneeded infrastructure, i.e., no ratepayers in Oregon will be burdened with paying for the LNG Terminal in the future. Accordingly, FERC has found that it does not need to economically regulate LNG terminals and does not need to consider market need for such facilities.

While NGA Section 3 contains a presumption in favor of export facilities, such as the LNG Terminal, NGA Section 7 requires the applicant to show that a natural gas pipeline is required by the public convenience and necessity. In reviewing a proposal to construct pipeline facilities, the Commission considers whether the proposal meets the criteria set forth in its Certificate Policy Statement.[291] Under the standards established in the Certificate Policy Statement, the Commission must evaluate a proposed project by balancing the likely public benefit against the adverse impacts associated with the project. FERC views this test as "a proportional approach, where the amount of evidence required to establish need will depend on the potential adverse effects."[292] When considering potential adverse effects, the Certificate Policy Statement requires an applicant to demonstrate that a new project: (i) will not rely on subsidization from existing customers, (ii) has eliminated or minimized any adverse effects the project may have on existing customers, competing pipelines, and its captive customers, and (iii) has eliminated or minimized any adverse effects the project may have on the interests of landowners and surrounding communities.

PCGP's proposed pipeline has no existing customers, so it meets part (i) of FERC's analysis. Similarly, there are no competing pipelines in the area of the LNG Terminal, and PCGP will benefit upstream pipelines by linking them to new demand, satisfying part (ii). The adverse

[290] *See, e.g.*, NRDC Comments at pp. 25-26
[291] *Certificate Policy Statement.*
[292] *Id.* at p. 61,227; *see also Jordan Cove Energy Project, L.P.*, 154 FERC ¶ 61,190 at P 34 (2016), *reh'g denied*, 157 FERC ¶ 61,194 (2016).

impacts from a new project on landowners and surrounding communities are potentially significant, and FERC expects pipelines to take steps to minimize the need for eminent domain. Through extensive easement negotiations, PCGP has substantially reduced the need for eminent domain, satisfying part (iii). As of July 17, 2019, approximately 75 percent of private landowners along the proposed route have signed voluntary easement agreements with PCGP. PCGP will continue to work with private landowners to obtain the highest possible number of voluntary easements.

PCGP has executed precedent agreements for 95.8% of the Pipeline capacity, which demonstrates the need for the Pipeline. Precedent agreements are the most common way to demonstrate market need, and FERC has long viewed precedent agreements as sufficient evidence of a market need for the project. In FERC's view, customer contracts for pipeline capacity are, in fact, the "best evidence" of market need.[293] Appellate courts have upheld FERC's reliance on precedent agreements to show need for a project. As the Third Circuit recently found, "[a] contract for a pipeline's capacity is a useful indicator of need because it reflects a 'business decision' that such a need exists. If there were no objective market demand for the additional gas, no rational company would spend money to secure the excess capacity."[294]

Although certain parties argue that FERC should discount the precedent agreements because they are with an affiliate, FERC's policy is not to distinguish between affiliate and non-affiliate precedent agreements. In addition, affiliate precedent agreements are common for LNG terminals.[295] The D.C. Circuit recently upheld FERC's view that affiliate and non-affiliate precedent agreements are given equal treatment. In *Appalachian Voices*, the Court explained that "[t]he fact that Mountain Valley's precedent agreements are with corporate affiliates does not render FERC's decision to rely on these agreements arbitrary or capricious."[296] The Court affirmed as "reasonabl[e]" FERC's explanation "that '[a]n affiliated shipper's need for new capacity and its obligation to pay for such service under a binding contract are not lessened just because it is affiliated with the project sponsor.'"[297]

One commenter also incorrectly claims that a precedent agreement for gas to be exported cannot be evidence of need.[298] As an initial matter, PCGP is not an export pipeline; it transports gas from the Malin Hub in Oregon to the LNG Terminal in Coos Bay. In addition, the Natural Gas Act includes a presumption in favor of Section 3 authorizations because Congress has determined that exports and imports of natural gas are in the public interest. In considering whether a project meets the public convenience and necessity under NGA Section 7, it is

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[293] *Mountain Valley Pipeline, LLC, et al.*, 161 FERC ¶ 61,043 at PP 40-41 (2017), *reh'g denied*, 163 FERC ¶ 61,197 (2018) (finding that "contracts entered into by the shippers are the best evidence that additional gas will be needed in the markets that [expansion projects] are intended to serve").

[294] *Township of Bordentown*, 903 F.3d at 262.

[295] *See, e.g.*, *Venture Global Calcasieu Pass, LLC, et al.*, 166 FERC ¶ 61,144 at P 9 (2019) (authorizing an LNG terminal and related pipeline with an affiliate precedent agreement); *Driftwood LNG LLC, et al.*, 167 FERC ¶ 61,054 at P 18 (2019) (same); *Port Arthur LNG, LLC, et al.*, 167 FERC ¶ 61,052 at P 14 (2019) (same); *Golden Pass Products LLC, et al.*, 157 FERC ¶ 61,222 at P 15 (2016) (same); *Magnolia LNG, LLC, et al.*, 155 FERC ¶ 61,033 at PP 11, 32 (2016) (same); *Sabine Pass Liquefaction, LLC, et al.*, 139 FERC ¶ 61,039 (2012) (same); *Corpus Christi LNG, L.P. , et al.*, 139 FERC ¶ 61,195 (2012) (same).

[296] *Appalachian Voices v. FERC*, 2019 WL 847199, at *1 (D.C. Cir. Feb. 19, 2019) (unpublished).

[297] *Id.* (quoting *Mountain Valley Pipeline, LLC*, 161 FERC ¶ 61,043, P 45).

[298] Snattlerake Comments at p. 16.

reasonable for FERC to take account of the fact that Congress has explicitly created a presumption in favor of exports of natural gas commodity, in Section 3; that aspect of the statutory scheme supports a finding that a pipeline related to an LNG export terminal advances the public convenience and necessity. The substantial benefits of the Project, together with the precedent agreements showing need for capacity to transport natural gas along the proposed Pipeline route, which is wholly within the United States, are more than sufficient to satisfy the Commission's test under the Certificate Policy Statement, as described above. FERC has approved numerous LNG terminals under Section 3 with associated pipelines under Section 7 where the precedent agreements for the pipeline were solely with the LNG terminal, which intended to export the gas.[299] That longstanding approach, supported by a reasoned explanation, is entitled to respect and judicial deference. No commenter has provided a justification or precedent for excluding the precedent agreements between JCEP and PCGP from consideration, and the Commission should not upset decades of settled precedent on this point.

FERC has historically viewed agreements for approximately 60% of pipeline capacity as sufficient to demonstrate project need, which PCGP has far exceeded.[300] In addition, PCGP held an open season for the pipeline capacity. The precedent agreements for almost all of the PCGP capacity and the reduction in negative impacts on landowners by virtue of the additional property rights already voluntarily acquired by PCGP demonstrate need and establish that the benefits of the Pipeline outweigh the impacts. Under FERC's Certificate Policy Statement analysis, the Pipeline should be approved.

B. Sections 3 and 7 Jurisdiction

Some parties argue that the Pipeline is either an intrastate pipeline or an export pipeline, which in either case should not be subject to FERC's NGA Section 7 jurisdiction.[301] Neither case is correct and, as discussed below, these arguments are without merit. While the Pipeline will be located entirely within the State of Oregon, it is not an intrastate pipeline (in the sense of not being an intrastate pipeline under the NGA) because it will carry gas that is in interstate commerce. PCGP will receive gas from Gas Transmission Northwest and Ruby Pipeline at Malin, each of which are FERC-jurisdictional interstate pipelines. PCGP will then transport that gas to the LNG Terminal, which is located in the United States. PCGP will transport gas in interstate commerce between two points in the United States; there is no basis for considering it an export pipeline under NGA Section 3.

The commenters' claims that the Pipeline is an intrastate line by analogy to two cases involving pipelines in Texas is also misplaced.[302] The pipeline in each of those cases carried gas produced in Texas to the Texas-Mexico border. Accordingly, the gas had never crossed state lines, and the pipelines were properly intrastate pipelines. PCGP will receive and transport gas that has already crossed state lines, making it gas in interstate commerce and rendering the Pipeline an

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[299] *See supra* n.295.

[300] *See e.g.*, *NEXUS Gas Transmission, LLC, et al.*, 160 FERC ¶ 61,022 at P 41 (2017) (finding precedent agreements of close to 60% of the system's capacity sufficient to demonstrate need).

[301] Snattlerake Comments at p. 14; Comments of Niskanen Center and Affected Landowners, et al., Accession No. 20190705-5199 at pp. 48-54 (July 5, 2019) ("Niskanen Center Comments").

[302] *Big Bend Conservation Alliance v. FERC*, 896 F.3d 418 (D.C. Cir. 2018); *Border Pipe Line Co. v. Federal Power Comm.*, 171 F.2d 149 (D.C. Cir. 1948).

interstate pipeline under the NGA. FERC has "consistently held that gas that flows across a state line at any stage of its movement from the wellhead to point of ultimate consumption is in 'interstate commerce' during the entire journey."[303] Furthermore, the fact that a pipeline does not transport gas across state lines "does not change the [interstate] nature of the gas."[304] PCGP will receive gas at its receipt points that has flowed across state lines and will transport that gas to the LNG Terminal. Under longstanding precedent, then, PCGP is clearly not an intrastate pipeline, and the commenter misunderstands the key facts of the cases it cites to argue otherwise.

Similarly, the argument that the Pipeline should be authorized under Section 3 has no basis in law. The basis for this claim is unclear, but the argument seems to be that a pipeline serving foreign commerce is not in interstate commerce and subject to FERC's Section 7 jurisdiction, citing to *Border Pipe Line Co.* In *Border Pipe Line Co*, however, the Federal Power Commission ("FPC", the predecessor to FERC) had asserted Section 7 jurisdiction over a pipeline in Texas that transported natural gas produced in Texas to the Mexican border.[305] The FPC asserted that the pipeline company was a "natural gas company" subject to Section 7 under the NGA due to its transportation of gas in foreign commerce.[306] The D.C. Circuit held that foreign commerce and interstate commerce are separate concepts and, unless Congress indicates in the statutory language that interstate commerce is meant to include foreign commerce, it does not.[307] The NGA includes separate sections regulating foreign commerce and interstate commerce, and contains a definition of "interstate commerce" that does not include foreign commerce. Accordingly, the D.C. Circuit found that the transportation of gas in foreign commerce does not render a pipeline subject to Section 7 jurisdiction that would not be so otherwise.[308]

As discussed above, however, the pipeline in *Border Pipe Line Co.* was an intrastate pipeline carrying gas produced in Texas to the border and not otherwise in interstate commerce. By contrast, the Pipeline for this Project transports gas that is in interstate commerce, making it subject to FERC's Section 7 jurisdiction. Moreover, when a pipeline transports gas to and across an international border, FERC has consistently held that "only a small segment of the pipeline close to the border is deemed to be the import or export facility for which NGA section 3 authorization is necessary."[309] Contrary to the commenter's argument that Congress intended for pipelines like PCGP to be subject to Section 3 based on the changes in EPAct 2005, Congress left unchanged the Commission's longstanding policy and practice to treat only this last segment as subject to Section 3.[310] Congress's decision not to displace that long-settled administrative practice weighs against interpreting Section 3 in the manner commenters suggest. Applied to the Project, PCGP would be the interstate pipeline that transports gas pursuant to Section 7 certificate authorization, while the LNG Terminal would be akin to the border crossing facilities that are subject to NGA Section 3 authorization. The Commission has applied this paradigm to numerous other LNG terminals, where the pipeline that delivers gas to the terminal is an interstate pipeline,

[303] *Western Interstate Gas Co.*, 59 FERC ¶ 61,022 at 61,049 (1992) (citing *California v. LoVaca Gathering Co.*, 379 U.S. 366 (1965)).
[304] *Id.*
[305] 171 F.2d 149, 150 (1948).
[306] *Id.*
[307] *Id.*
[308] *Id.*
[309] *Trans-Pecos Pipeline LLC*, 155 FERC ¶ 61,140 at P 31 (2016), *reh'g denied*, 157 FERC ¶ 61,081 (2017).
[310] Niskanen Center Comments at pp. 50-52.

while the terminal itself is subject to NGA Section 3.[311] The commenter fails to establish any basis for changing this long-standing interpretation of the NGA, and the cases commenter cites support, rather than undermine, treating the Pipeline as a Section 7 facility.

C. **Eminent Domain**

Certain commenters assert that it is constitutionally impermissible to allow eminent domain for the Project. That is incorrect. Under Section 7(h) of the Natural Gas Act, "any holder of a certificate of public convenience and necessity" has eminent domain authority.[312] This is an unambiguous statutory mandate. "The Commission does not have the discretion to deny a certificate holder the power of eminent domain,"[313] and it "does not have the authority to limit a pipeline company's use of eminent domain once the company has received its certificate."[314]

The governing constitutional principles under the Takings Clause are equally clear. "If and when" landowners' property is subject to eminent domain, they will be constitutionally "entitled to just compensation, as established in a hearing" before a court.[315] But the Takings Clause is not a vehicle for litigating policy disagreements about whether to build an infrastructure project. So long as just compensation is paid, the sole requirement is that takings be for "public use."[316] This simply means that takings must "serve[] a 'public purpose.'"[317] "[T]he public use requirement of the Takings Clause is coterminous with the regulatory power, and . . . [a] Court will not strike down a condemnation on the basis that it lacks a public use so long as the taking 'is rationally related to a conceivable public purpose.'"[318] Therefore, "FERC's rational public convenience and necessity determination satisfies the Fifth Amendment's 'public use' requirement."[319]

The Project will plainly serve a public purpose within the meaning of the Takings Clause because, as discussed above, it will satisfy demonstrable market need and provide numerous other public benefits, including (but not limited to) job creation and tax revenues. Some commenters argue that a project related to exports cannot meet the public use requirement,[320] but there is no support for that contention. Among other things, facilities that support exports "promote national

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[311] *See, e.g., Venture Global Calcasieu Pass, LLC, et al.*, 166 FERC ¶ 61,144 at P 9 (2019); *Driftwood LNG LLC, et al.*, 167 FERC ¶ 61,054 at P 18 (2019); *Port Arthur LNG, LLC, et al.*, 167 FERC ¶ 61,052 at P 14 (2019); *Golden Pass Products LLC, et al.*, 157 FERC ¶ 61,222 at P 15 (2016).
[312] 15 U.S.C. § 717f(h).
[313] *Midcoast Interstate Transmission, Inc. v. FERC*, 198 F.3d 960, 973 (D.C. Cir. 2000).
[314] *PennEast Pipeline Co.*, 164 FERC ¶ 61,098 at P 33 (2018).
[315] *Del. Riverkeeper Network v. FERC*, 895 F.3d at 110; *see* 15 U.S.C. § 717f(h).
[316] U.S. Const. amend V.
[317] *Kelo v. City of New London*, 545 U.S. 469, 480 (2005).
[318] *Nat'l R.R. Passenger Corp. v. Boston & Me. Corp.*, 503 U.S. 407, 422 (1992) (quoting *Haw. Housing Auth. v. Midkiff*, 467 U.S. 229, 240-41 (1984)).
[319] *Appalachian Voices v. FERC*, 2019 WL 847199, at *2; *see Midcoast*, 198 F.3d at 973 ("[B]ecause, in issuing the certificate . . . , the Commission has explicitly declared that the . . . Pipeline will serve the public convenience and necessity, we hold that the takings complained of served a public purpose).
[320] WELC Comments at p. 245; Comments of Deb Evans, Ron Schaaf, and Bill Gow, Accession No. 20190705-5198 at p. 11. (July 5, 2019) ("Evans, Schaaf, and Gow Comments"); Comments of Samantha L. Krop, Accession No. 20190705-5203 at p. 5 (July 5, 2019) ("Krop Comments"); Comments of Bill Gow and the Gow Ranch, Accession No. 20190708-5020 at pp. 1, 4 (July 8, 2019) ("Gow Comments"); Comments of James K. Neu, Accession No. 20190627-0203 at p. 3 (June 26, 2019) ("Neu Comments").

economic policy by reducing barriers to foreign trade and stimulating the flow of goods and services" between the United States and other countries.[321] Indeed, the Natural Gas Act's text explicitly recognizes Congresses' determination that the exportation and importation of natural gas is in the public interest of the United States.[322]

Nor is it relevant, as several commenters suggest,[323] that the Project is to be constructed by a private developer or that some benefits will flow to investors. "Congress may, as it did in the NGA, grant condemnation power to 'private corporations . . . execut[ing] works in which the public is interested.'"[324] Moreover, "if the legislature . . . decide[s] that th[e] general benefit is better promoted by [a project's] construction through individuals or corporations than by the State itself," it may confer eminent domain authority on a private developer regardless of any "motives of private gain" on the developer's part.[325] That a project may benefit private investors as well as the broader public does not diminish its public purpose.

One group of commenters also advances the extraordinary argument that "purely economic" benefits cannot alone satisfy the Takings Clause's requirement of a public purpose.[326] But the very case they cite, *Kelo v. New London*, rejected that exact contention, holding that "neither precedent nor logic supports" the idea "that economic development does not qualify as a public use."[327] On the contrary, "[p]romoting economic development is a traditional and long-accepted function of government."[328]

Finally, some commenters assert that it violates the Public Use Clause to grant a certificate that requires the holder to meet environmental conditions (such as acquiring permits from other state and federal agencies) prior to starting physical construction.[329] But a project does not lack a public purpose simply because it cannot *immediately* be constructed; all that is required to satisfy the Public Use Clause is that it "rationally could [be] believed that the [taking] would promote" a public purpose.[330] Commenters speculate that the Project *may* not ultimately be completed because permits *may* not be issued,[331] but such (unwarranted) speculation is beside the point. The Supreme Court has expressly rejected the argument that the Public Use Clause analysis "should require a 'reasonable certainty' that the expected public benefits will actually accrue."[332] It is

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[321] *Valley Crossing Pipeline, LLC*, 161 FERC ¶ 61,084 at P 13 (2017).
[322] 15 U.S.C. § 717b; *see Sierra Club v. U.S. Dep't of Energy*, 867 F.3d at 192 (noting "the Natural Gas Act's 'public interest' test" for exportation or importation of natural gas).
[323] WELC Comments at p. 245; Gow Comment at p. 4; Krop Comments at p. 5; McLaughlin Comments at pp. 2, 6; *cf.* Adams Comments at p. 6.
[324] *E. Tenn. Nat. Gas Co. v. Sage*, 361 F.3d 808, 821 (4th Cir. 2004) (quoting *Mississippi & Rum River Boom Co. v. Patterson*, 98 U.S. 403, 406 (1878)); *see also Cherokee Nation v. S. Kan. Ry. Co.*, 135 U.S. 641, 657-58 (1890) (observing that "the corporation by which [a railroad] is constructed . . . may be permitted, under legislative sanction, to appropriate private property for the purposes of a right of way").
[325] *Cherokee Nation*, 135 U.S. at 658 (citation omitted).
[326] Niskanen Center Comments at pp. 60-62.
[327] *Kelo*, 545 U.S. at 484.
[328] *Id.*
[329] Niskanen Center Comments at pp. 62-68; *cf.* Evans, Schaaf, and Gow Comments at p. 12.
[330] *Midkiff*, 467 U.S. at 242 (quoting *W. & S. Life Ins. Co. v. State Bd. of Equalization*, 451 U.S. 648, 671-72 (1981)).
[331] Niskanen Center Comment at p. 63.
[332] *Kelo*, 545 U.S. at 488-489; *see also Midkiff*, 467 U.S. at 242-243 ("[W]hether *in fact* the [taking] will accomplish its objectives is not the question," and "empirical debates over the wisdom of takings" are not part of the public use analysis (internal quotation marks omitted and emphasis added)).

therefore unsurprising that the D.C. Circuit—mere months ago—rejected a virtually identical Public Use Clause challenge to the Commission's approval of a pipeline before it had secured all permits required to begin physical construction.[333]

D. Public Trust Doctrine

Some commenters assert, without any supporting authority or explanation, that the Project would violate the public trust doctrine.[334] These assertions are baseless. There is no federal public trust doctrine that binds the federal government. "[T]he public trust doctrine [is] a matter of state law,"[335] and the Supreme Court has "directly and categorically rejected any federal constitutional foundation for [the public trust] doctrine, without qualification or reservation."[336] Regardless, even if there were some federal common-law public trust doctrine, it would be displaced in this context by the Natural Gas Act and other federal statutes comprehensively regulating the approval and environmental regulation of FERC-jurisdictional natural gas transportation facilities.[337] Another group of commenters invokes the *Oregon* public trust doctrine,[338] but Oregon public trust principles cannot and do not constrain the FERC's administration of federal law.[339]

On a related point, one commenter asserts that the Project and its effects would violate the Fifth Amendment, apparently in connection to issues related to greenhouse gas emissions and climate change.[340] Although not entirely clear, this may be a reference to the recent district court decision in *Juliana v. United States*, which recognized a substantive due process right "to a climate system capable of sustaining human life."[341] With due respect to the district court, that decision—which is currently on appeal[342]—is incorrect. But even if it *were* correct, the substantive due process right the district court purported to recognize is irrelevant here. Any argument that this discrete Project threatens to make the "climate system [in]capable of sustaining human life" would be frivolous. Even the district court in *Juliana* did not purport to find that any action that might conceivably have an incremental relationship to climate change violates the Fifth Amendment.[343]

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[333] *Appalachian Voices*, 2019 WL 847199, at *1-2.
[334] Neu Comments at p. 1; Comments of Barbara Ullian, Accession No. 20190701-5329 at p. 1 (July 1, 2019).
[335] *PPL Montana, LLC v. Montana*, 565 U.S. 576, 603 (2012).
[336] *Alec L. ex rel. Loorz v. McCarthy*, 561 Fed.Appx. 7, 8 (D.C. Cir. 2014).
[337] *See, e.g., Schneidewind v. ANR Pipeline Co.*, 485 U.S. 293, 300-01 (1988) ("The NGA long has been recognized as a comprehensive scheme of federal regulation of all wholesales of natural gas in interstate commerce," and "confers upon FERC exclusive jurisdiction over the transportation and sale of natural gas in interstate commerce for resale." (internal quotation marks omitted)); *cf. Am. Elec. Power Co., Inc. v. Connecticut*, 564 U.S. 410, 424 (2011) ("The test for whether congressional legislation excludes the declaration of federal common law is simply whether the statute speaks directly to the question at issue." (internal quotation marks and alterations omitted)).
[338] League of Women Voters Comments at pp. 72-73.
[339] *See* U.S. Const. art. VI, cl. 2.
[340] Neu Comments at p. 1.
[341] *Juliana v. United States*, 217 F.Supp 3d 1224, 1250 (D. Or. 2016).
[342] *See Juliana v. United States*, No. 18-36082 (9th Cir.).
[343] *Juliana*, 217 F.Supp.3d at 1250 (recognizing impropriety of "the constitutionalization of all environmental claims"); *see also Guertin v. Michigan*, 912 F.3d 907, 921-22 (6th Cir. 2019) ("[T]he Constitution does not guarantee a right to live in a contaminant-free, healthy environment.").

E. **Abandonment**

Certain commenters argue that there is no current plan for removal of the Pipeline.[344] These concerns are inapplicable to these proceedings. PCGP does not anticipate a scenario in which the Project, once constructed, would no longer be needed. However, upon any future abandonment, PCGP would seek the appropriate authorizations from the FERC. When and if an application is filed, the environmental impact of the abandonment would be examined. PCGP would follow all applicable regulatory requirements to decommission the Pipeline.

IV. *Other Legal Arguments*

A. **Forest Service and BLM Plan Amendments**

1. The BLM and the Forest Service prepared appropriate plan amendments.

The proposed Pipeline route traverses areas of BLM and Forest Service land that are part of BLM District Resource Management Plans ("RMPs") and Forest Service Land and Resource Management Plans ("LRMPs"). As required by FLPMA and the NFMA, activities on BLM and Forest Service lands must be consistent with the applicable RMPs and LRMPs.[345] Here, BLM and the Forest Service have reviewed the Project and have worked cooperatively with FERC and PCGP to identify route variations and to incorporate various project design requirements, minimization measures, and mitigation to ensure consistency with the RMPs and LRMPs.[346] In some cases, the BLM and the Forest Service have identified areas where the Pipeline would not be consistent with certain requirements of the RMPs and LRMPs, and consequently, the agencies have proposed plan amendments, as permitted by FLPMA and NFMA.[347]

Some commenters claim that the proposed plan amendments improperly seek to exempt the Pipeline from necessary requirements of the RMPs and LRMPs without ensuring that additional modifications could not be implemented or gaps further mitigated.[348] The BLM and the Forest Service undertook an extensive review of the Pipeline to determine the consistency of construction, restoration, and operation of the Pipeline with each applicable management objective, management direction, and element of the RMPs and LRMPs. The results of this analysis, contained in Appendix F.1 of the DEIS, documents how consistency is demonstrated (*e.g.*, via agency approved plans, via application of best management practices, via route selection, or via offsite mitigation). Where the Pipeline would be inconsistent and a plan amendment is required, the appendix identifies the relevant discussions in the DEIS and the specific Plan of Development attachments pertaining to the determination.

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[344] Jackson County Comments at pp. 4.
[345] *See* 43 U.S.C. § 1712; 16 U.S.C. § 1604.
[346] *See, e.g.*, DEIS at pp. 4-443, 4-447.
[347] *See* DEIS at pp. 2-22 to 2-32. In addition, Appendix F.1 to the DEIS contains specific consistency analyses that resulted in the decision to propose each plan amendment. *See* Appendix F.1 at pp. 4, 7, and 27 (Northwest and Coastal RMP); Appendix F.1 at pp. 29, 32, 34, and 52 (Southwest Oregon RMP); Appendix F.1 at pp. 62, 66, 73, 92, 99 (Umpqua National Forest LRMP); Appendix F.1 at pp. 114, 127, 142, 145, 160, 163, 177, 197, 214, 232, 247, and 249 (Rogue River National Forest LRMP); Appendix F.1 at pp. 276-77, 293, 295, 298 (Winema National Forest LRMP); Appendix F.1 at p. 302 (LRMPs as amended by the Northwest Forest Plan).
[348] NRDC Comments at pp. 103-06.

Other commenters claim that given a BLM policy against requiring compensatory mitigation, violations of BLM's RMP cannot be allowed.[349] The policy to which commenters cite relates to money payments to BLM and does not mean that no mitigation would occur on BLM lands to ensure consistency with the RMPs. To the contrary, numerous mitigation measures are built into the project design features and project requirements that would be mandated for the Pipeline, and indeed, "offsite mitigation" is specifically identified in Appendix F.1 as one of the avenues used to evaluate consistency of the Project with RMP and LRMP requirements. Furthermore, PCGP's comments on the DEIS noted PCGP's voluntary commitment to fund projects on BLM land to offset impacts, among other mitigation offerings.[350] A commenter further claims that BLM would be allowing clear-cutting of LSR without any mitigation,[351] and a different commenter claims that the proposed mitigation overall is inadequate to compensate for the permanent loss of old growth forest and other wildlife habitat.[352] In addition to the BLM mitigation noted above, and the extensive Forest Service mitigation discussed in Section 2.1.5 of the DEIS and Appendix F.2, PCGP is proposing to acquire and preserve roughly double the acreage of late-seral and old growth ("LSOG") forest that would be removed by the Project.[353] These mitigation offerings, coupled with a host of other proposed best management practices, route adjustments, and minimization efforts, provide a reasoned basis for the BLM and Forest Service to find consistency with various RMP and LRMP provisions, and to tailor the proposed plan amendments after ensuring that the Project has been modified to conform to the requirements to the degree feasible.[354]

One commenter claims that the Project would violate the Northwest Forest Plan by causing unmitigated harms to LSR, focusing, for example, on LSR impacts in the Rogue River National Forest.[355] A close analysis of the commenter's claims demonstrates that this is not accurate. The commenter notes 810 acres of impacts to LSR but only 522 acres of matrix proposed for reallocation to the LSR land use allocation.[356] Similarly, the commenter notes impacts to 426 acres of LSOG but only 237 acres of LSOG in the matrix proposed as mitigation.[357] The commenter claims that the mitigation offerings here are net decreases in acreage. However, the 810 acres and 426 acres of impacts include indirect effects encompassing 100 meters on each side of cleared corridor edge in LSOG.[358] The actual acreage of cleared LSOG is 55, with an additional 21 acres of impacts from modification to LSOG, for a total of 76 acres, with 237 acres of LSOG proposed to be reallocated from the matrix as mitigation.[359] Similarly, the 522 acres of LSR reallocation corresponds to clearing of 206 acres and modifying of 70 acres, for a total of 276 acres.[360] In both cases, the proposed acres of matrix reallocation are significantly more than the acres cleared and modified.

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[349] OWLT Comments at pp. 5-6; NRDC Comments at pp. 106-07.
[350] *See* Applicants' DEIS Comments at Attachment A at 13-14.
[351] OWLT Comments at pp. 5-6.
[352] WELC Comments at p. 254.
[353] *See* Applicants' DEIS Comments at Attachment A at 13-14.
[354] *See, e.g.*, DEIS at p. 4-443.
[355] Klamath Siskiyou Wildlands Center Comments at p. 7.
[356] *See* DEIS at pp. 4-529, 4-531.
[357] *See* DEIS at p. 4-531.
[358] *See* DEIS at p. 4-531, Table 4.7.3.6-5, note a.
[359] DEIS at p. 4-531.
[360] *Id*.

One commenter claims that, without explanation, the DEIS applies a different standard for management of LSRs than was presented in a 2014 draft EIS for a past iteration of PCGP's proposed pipeline.[361] The alleged change relates to standards for non-silvicultural activities in LSR contained in the Northwest Forest Plan at C-16 and C-17. Here, the DEIS provides the correct standard for the development of new facilities, such as pipelines, quoted verbatim from the Northwest Forest Plan.[362] The commenter identifies a sentence in the 2014 draft EIS that attempted to restate a "general guideline" taken from an introductory section of the Northwest Forest Plan's section on non-silviculture activities in LSR.[363] That general guideline simply states that certain activities that are neutral or beneficial to LSR habitat are allowed.[364] It is incorrect to interpret the "general guideline" to prohibit all non-silviculture activities unless they are neutral or beneficial to LSRs. Indeed, the applicable standards for the development of new pipelines at C-17 and for rights-of-way at C-19 specifically note that projects may be approved notwithstanding adverse impacts, provided the adverse impacts are, respectively, made the "least possible" following minimization and mitigation efforts, or "reduced."[365]

A commenter claims that the DEIS fails to disclose effects to LSR on BLM lands.[366] This allegation overlooks the disclosure of these impacts in several locations. For example, Table 4.7.3.3-3 discloses acreage impacts to dry forest and moist forest LSRs on BLM lands.[367] Appendix I discloses impacts to LSR areas in BLM districts as part of the Forest Operations Inventory,[368] and impacts on LSRs on BLM land are considered within, for example, the vegetation, wildlife, and protected species discussions.[369] In addition, impacts to LSR was specifically analyzed in the BLM's assessment of consistency with the approved RMPs for affected districts.[370]

One commenter alleges that the DEIS fails to include any detailed or qualitative analysis of the effects of new forest edges on wildlife and any specific mitigation efforts.[371] To the contrary, the DEIS discusses forest edge effects and habitat fragmentation on terrestrial wildlife species, and corresponding specific mitigation measures, in the wildlife and protected species discussions.[372] In addition, impacts to wildlife resulting from new forest edges and specific mitigation measures are discussed in the Forest Service's proposed amendments to the Umpqua, Rogue River, and Winema LRMPs and compensatory mitigation plans in Appendix F.2.[373] The Survey and Manage Species Persistence Evaluation summarizes the specific edge effects to Survey and Manage

[361] Klamath Siskiyou Wildlands Center Comments at p. 4
[362] *Compare* DEIS at p. 4-517 *with* the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl at Attachment A, Page C-17, Forest Service and BLM (1994) ("NWFP ROD").
[363] Klamath Siskiyou Wildlands Center Comments at p. 4.
[364] NWFP ROD at Attachment C, page C-16.
[365] NWFP ROD at Attachment C, page C-17.
[366] Klamath Siskiyou Wildlands Center Comments at p. 5.
[367] DEIS at pp. 4-441 to 4-442, Table 4.7.3.3-3.
[368] DEIS Appendix I at Table I-6.
[369] *See* DEIS at pp. 4-176, 4-227, 4-327, and 4-443.
[370] *See* DEIS Appendix F.1 at pp. 27, 52.
[371] Klamath Siskiyou Wildlands Center Comments at p. 7.
[372] DEIS at pp. 4-215 to 4-216, 4-228, 4-395 to 4-399.
[373] *See* DEIS Appendix F.2 at pp. 2-3 to 2-4, 2-6 to 2-7, 2-30, 2-33, 2-42 to 2-43, 2-60 to 2-62, 2-69 to 2-71.

species.[374] Likewise, the Forest Service's LSR Technical Report includes specific edge effects to LSR and to wildlife species dependent on LSR, as well as proposed mitigation actions and related LRMP amendments.[375] In areas where the Project crosses LSOG and LSR and suitable marbled murrelet habitat, PCGP sited the Pipeline in a manner that would minimize the amount of tree removal, habitat fragmentation, and creation of new forest edges.[376]

One commenter alleges that the DEIS lacks any discussion of an increased fire risk associated with converting mature forest stands into a continuous corridor of early seral plant communities, that it decreases options for future fire management in LSRs, and that it lacks discussion of any mitigation measures.[377] The DEIS, however, acknowledges such an increased risk[378] and also addresses fuels reduction and stand density management, which would mitigate the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire.[379] The commenter states that the Umpqua National Forest is the only land management area that presents mitigation measures that would lower the risk of loss of developing and existing mature stands and other valuable habitats to high-intensity fire.[380] The commenter overlooks such fire risk mitigation measures for the Rogue River National Forest outlined in Section 4.7, however, which would include stand density management on 618 acres (pre-commercial thinning), terrestrial habitat improvements on 1,153 acres and decommissioning approximately 57.5 miles of roads.[381] In addition, PCGP noted additional fuels reduction mitigation measures on 2,553 acres it has voluntary committed to implement on BLM lands that would reduce risk of loss of developing and existing mature stands to high-intensity fire.[382]

2. The Forest Service is complying with planning rule requirements, and the DEIS appropriately addresses proposed plan amendments.

Several commenters claim that the Forest Service is proposing to eliminate certain forest plan requirements that PCGP cannot meet, without undertaking the requisite analysis, without applying to the amendment the substantive provisions of the Forest Service's planning rules at 36 C.F.R. Part 219 (known as the "2012 Planning Rule," as amended in 2016), and without creating new forest plan components to address the same resource protection needs.[383] These claims lack merit.

Some commenters claim that the Forest Service selectively applied, or avoided altogether, substantive requirements in the 2012 Planning Rule that are directly related to the changes being proposed.[384] Commenters cite to recent circuit decisions where the court found that the Forest Service failed to identify substantive requirements that were directly related to the amendments at

[374] *See* DEIS Appendix F.5 at pp. 2-13, 2-27, 2-46, 2-150, 2-168, 2-187.
[375] *See* DEIS Appendix F.3 at pp. 8-9, 26-28, 29-31, 40-42, 43-45.
[376] *See* Applicants' DEIS Comments at Attachment A, 9, 13-14.
[377] Klamath Siskiyou Wildlands Center Comments at pp. 8-9.
[378] DEIS at p. 4-450.
[379] *Id*.
[380] Klamath Siskiyou Wildlands Center Comments at p. 9.
[381] DEIS at pp. 4-461, 4-529.
[382] *See* Applicants' DEIS Comments at Attachment A at 9, 13-14.
[383] WELC Comments at p. 252.
[384] *Id*. at p. 253.

issue in those cases.[385] Here, however, the Forest Service specifically identified which requirements are likely to be directly related to each of the amendments.[386] Commenters' citations to recent court decisions focus on the Forest Service's failure in those cases to consider the purpose of the proposed plan amendments in determining that a substantive requirement was directly related.[387] Here, in each plan amendment discussion, the DEIS identifies the purpose of the plan amendment as a basis for which substantive requirements are directly related.[388]

One commenter claims that the DEIS does not adequately apply the substantive requirements within the scope and scale of the amendment, claiming that the DEIS contains very little site-specific analysis and fails to consider cumulative impacts, particularly with reference to the very limited extent of impacted acres across each national forest.[389] The DEIS appropriately considers and documents how the Forest Service proposes to apply each substantive requirement within the scope and scale of the amendment. Appendix F.2 contains tables that summarize the relevant information. For example, for amendment UNF-1 in the Umpqua National Forest, an amendment related to removal of effective shade on perennial streams, the table identifies the directly related substantive requirement, identifies the 3 acres of shading vegetation that the Pipeline would remove (noted to be 0.001% of the plan area), identifies project design features that would aid in addressing those impacts, and identifies several categories of compensatory mitigation (i.e., fish passage improvements at 11 sites, 7.2 miles of road decommissioning, and 11.4 miles of road storm-proofing).[390] This reflects an appropriate application of the substantive requirements within the scope and scale of plan amendments that affect tiny fractions of the areas addressed in each plan.

Some commenters claim that the Forest Service failed to propose new plan amendments that meet the resource protection needs of the forest plan provisions that the Pipeline cannot meet.[391] The commenters attack the DEIS for alleged vague references to the mitigation measures identified in PCGP's POD and design requirements that, the commenter asserts, are not tied to any specific amendments.[392] These comments ignore the Forest Service's detailed summary in Appendix F.2, where the Forest Service presents a suite of project design features and compensatory mitigation for each plan amendment. This appendix, and the corresponding discussions of plan amendments in the main text of the DEIS, refute the commenters' claims. For soil, water, and riparian areas in the Umpqua National Forest LRMP, for example, the DEIS discusses design features and mitigation measures in a variety of specific plans and technical documents, including the Erosion Control and Revegetation Plan, Right-of-Way Clearing Plan, Wetland and Waterbody Crossing Plan, Forest Service Site Specific Stream Crossing Prescriptions, Wetland Procedures, Best Management Practices for the State of Oregon, and industry best management practices and measures identified from the Technical Report on Soil

[385] *Sierra Club, Inc. v. United States Forest Serv.*, 897 F.3d 582, 601 (4th Cir.); *Cowpasture River Pres. Ass'n v. Forest Serv.*, 911 F.3d 150, 161-62 (4th Cir. 2018).
[386] *See* DEIS at pp. 4-445 to 4-486, DEIS Table 2.1.3.3-1, DEIS Table 2.1.3.4-1, DEIS Table 2.1.3.5-1.
[387] WELC Comments at pp. 250-252; Klamath Siskiyou Wildlands Center Comments at p. 3.
[388] *See e.g.*, DEIS at pp. 4-446, 4-449, 4-452 (Umpqua National Forest proposed amendments).
[389] Klamath Siskiyou Wildlands Center Comments at p. 3.
[390] *See* DEIS, Appendix F.2 at pp. 2-13 to 2-14.
[391] WELC Comments at p. 252.
[392] *Id*. at pp. 252-53.

Risk and Sensitivity Assessment.[393] These are not simply generic references. Returning to the above example, the DEIS identifies seven specific measures from the Erosion Control and Revegetation Plan and the Right-of-Way Clearing Plan for site-specific consideration (to be applied at 39 acres with certain soils with greater risk/sensitivity classifications).[394] This level of amendment-specific and site-specific analysis further illustrates how the Forest Service is appropriately applying the substantive requirements within the scope and scale of each amendment.

A commenter claims that the proposed plan amendments violate the NFMA because site-specific forest plan amendments are not, as the statute requires, incorporated in one document or set of documents.[395] The DEIS, however, is not intended to constitute the integrated plan for each of the affected forest plans; rather, it is a NEPA document meant to discuss the proposed actions, the alternatives to those actions, and the actions' environmental impacts. If the Forest Service ultimately decides to approve the project-specific plan amendments to the LRMPs following issuance of the final EIS, the Forest Service would prepare Records of Decision ("RODs"). Those RODs would set forth the integrated plans for the affected LRMPs. The NFMA does not require that draft NEPA documents themselves constitute the integrated plan.

Some commenters claim that the DEIS fails to identify the need for alleged additional plan amendments related to the Northwest Forest Plan's Aquatic Conservation Strategy ("ACS") and Survey and Manage.[396] The DEIS specifically assessed whether the Pipeline would prevent attainment of the ACS objectives, whether the Pipeline would affect the persistence of Survey and Manage species, and whether plan amendments were needed.[397] The Pipeline would cross six fifth-field watersheds in areas where the ACS objectives apply, and the DEIS summarizes the Forest Service's watershed-specific analyses supporting its conclusion that the Pipeline would not prevent attainment of ACS objectives and has incorporated measures consistent with the Riparian Reserve standards and guidelines.[398] This discussion includes consideration of short-term impacts, Project modifications to respond to ACS objectives, and additional on-site and off-site mitigation measures as a basis for the conclusion that Project-related impacts are within the range of natural variability in the affected watersheds.[399] As a result, the Forest Service concluded no ACS amendments are necessary.

Commenters limit most of their allegations of ACS deficiencies to vague topic areas (e.g., vegetation removal, sediments, water withdrawals, temperature impacts, turbidity, mercury) but fail to address the existing analysis in Appendix F.4 supporting the DEIS's conclusions.[400] One commenter focuses on construction in the Upper Cow Creek watershed, and the commenter claims that the DEIS finds a high potential for impacts that could prevent achievement of ACS objectives at that location.[401] However, the commenter ignores the rest of the discussion, which highlights

[393] DEIS at pp. 4-453 to 4-454.
[394] *Id*. at p. 4-454.
[395] WELC Comments at pp. 247-248.
[396] *Id*. at 253-254; Klamath Siskiyou Wildlands Center Comments at p. 4; Oregon State Agencies at p. 29.
[397] *See* DEIS Appendix F.1 at p. 302 (summary conclusions).
[398] DEIS at pp. 4-486 to 4-516, DEIS, Appendix F.4.
[399] DEIS at pp. 4-515 to 4-516.
[400] WELC Comments at pp. 253-254; Klamath Siskiyou Wildlands Center Comments at p. 4.
[401] Klamath Siskiyou Wildlands Center Comments at p. 4.

Project routing, site-specific best management practices, water temperature mitigation measures, and geochemical analysis of soils analyzing potential for mercury mobilization.[402] This discussion represents the kind of analysis undertaken to ensure that the Project would not prevent attainment of ACS objectives.

Challenges to the DEIS conclusions regarding Survey and Manage, and commenters' claims that additional Survey and Manage plan amendments are required,[403] are similarly lacking in merit. The DEIS extensively discusses the Pipeline's potential impacts on persistence of Survey and Manage species in section 4.6.4.3 and Appendix F.5 using site-specific analysis on known sites and surrounding protective buffers. As required under NEPA, the DEIS discusses incomplete and unavailable information as part of its analysis.[404] The DEIS concludes that the Pipeline could affect site persistence of 38 Survey and Manage species, with 37 of them having a reasonable assurance of species persistence.[405] For the one species without such reasonable assurance, the DEIS recommends a route variation to avoid the impact.[406] The plan amendments consider the Survey and Manage impacts and appropriately propose project design requirements tied to the scope and scale of the amendments without waiving the persistence objective for Survey and Manage species.[407] Commenters are incorrect that plan amendments relating to Survey and Manage have been ignored, as several of the plan amendments are specific to Survey and Manage species.[408]

3. The NFMA does not prohibit pipelines on national forest lands.

Some commenters claim that the National Forest Management Act bars routing of PCGP's Pipeline on national forest lands.[409] To the contrary, the Mineral Leasing Act explicitly authorizes rights-of-way through federal lands, with no exclusion for national forest lands, for the transportation of natural gas.[410] Forest Service regulations and the Forest Service Manual confirm that the Mineral Leasing Act grants authority for national forest lands for permits and easements to support oil and gas pipelines.[411]

B. Tribal Issues and the National Historic Preservation Act

Several commenters argue that the DEIS fails to comply with the NHPA.[412] Under the NHPA Section 106, the Commission must consider the effects of its undertakings on historic

[402] DEIS at pp. 4-503 to 4-504.
[403] Klamath Siskiyou Wildlands Center Comments at pp. 4, 10-11; WELC Comments at p. 253.
[404] DEIS at pp. 4-384 to 4-385.
[405] *Id*. at p. 4-399.
[406] *Id*.
[407] *See generally id*. at Section 4.7.3.4.
[408] *See, e.g.*, DEIS at pp. 4-445, 4-456, 4-473 (Amendment FS-1).
[409] Forest Service Employees Comments at pp. 1-2.
[410] *See* 30 U.S.C. § 185(a).
[411] 36 C.F.R. § 251.53(e); U.S. Forest Service Manual 2701.1(4) (1997).
[412] *See* Grand Ronde Comments at pp. 1-3; Band of Umpqua Tribe of Indians submits letter re the Draft Historic Properties Management Plan for the Pacific Connector Gas Pipeline Project, Accession No. 20190710-0006 at pp. 1-2 (July 10, 2019) Cow Creek Comments at p. 8; Letter regarding Landfill Closure and NHPA 106 Consultation of Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians, Accession No. 20190510-5056 at pp. 3-4 (May 10, 2019).

resources.[413] Suggestions that the Commission must withdraw the DEIS until it completes the Section 106 process are legally incorrect and conflate two separate processes. The Commission is not obligated to use the DEIS to fulfill its Section 106 obligations.[414] The Section 106 process remains underway, and additional consulting parties will have ample opportunity to participate in efforts to identify historic resources and evaluate measures to mitigate impacts to those resources.

The Commission does not violate either NEPA or the NHPA by completing the Section 106 process after the DEIS has been issued or even after issuing a certificate. Regulations implementing Section 106 explicitly contemplate scenarios where alternatives under consideration include corridors where property access is restricted and phased identification or evaluation is appropriate.[415] The DEIS explicitly discloses that Section 106 compliance has not been complete and recommends that the Commission not authorize the Project to commence any construction or use of all staging, storage, temporary work areas and access roads until the Section 106 process is complete.[416] Moreover, any FERC order that would be issued would be conditioned upon completion of the Section 106 process.[417] The Commission has previously affirmed that such conditional orders may be issued prior to completion of the Section 106 process because destructive construction activities would not commence until required surveys and consultation are complete.[418] This sequencing has been upheld in court.[419]

In addition, several comments argue that the DEIS fails to provide for meaningful government-to-government consultation with the various impacted tribes.[420] Again, the commenters confuse the Commission's obligations under NEPA and the NHPA. The Commission indicated that it would endeavor to work with Indian tribes on a government-to-government basis, including direct contact between agencies and tribes that recognizes the status of the tribes as governmental sovereigns.[421] However, this requirement is not to be conflated with that of NEPA. NEPA requires the identification of alternatives and environmental impacts. While the DEIS may be helpful context for government-to-government consultation, the DEIS suffers no deficiency for not itself engaging in such consultations. Moreover, because most of the tribes have intervened in this matter, the requisite government-to-government consultation cannot yet occur, as it would constitute improper *ex parte* communications.[422]

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[413] 54 U.S.C. § 306108.
[414] *See* 36 C.F.R. § 800.8(c).
[415] 36 C.F.R. § 800.4(b)(2).
[416] DEIS at p. 5-8.
[417] *See id*. at 4-655.
[418] *See Tenn. Gas Pipeline Co.*, 162 FERC ¶ 61,013, at P 8 (2018) (conditioning and order on completion of the Section 106 process before pipeline construction could begin); *Re Iroquois Gas Transmission System, L.P.*, 53 FERC ¶ 61,194, at PP 61,759-64 (1990) (required company to defer construction of its proposed loops until completion of the NHPA review process for each segment of the facility).
[419] *City of Grapevine, Tex.*, 17 F.3d at 1509 (upholding an agency's conditional approval for an airport runway when expressly conditioned on the completion of Section 106 process).
[420] *See, e.g.,* CTCLUSI Comments at p. 1; Grand Ronde Comments at p. 1.
[421] 18 C.F.R. § 2.1c.
[422] 18 C.F.R. § 385.2201 (prohibiting off-the-record communications).

V. *Geological Resources*

A. **Earthquakes and Tsunamis**

Certain other commenters expressed concerns related to a potential rupture of the offshore Cascadia Fault Zone, and subsequent impacts on the Project from related earthquakes and/or tsunamis.[423] These comments focus on impacts from a potential earthquake or tsunami to the LNG Terminal and port, as well as impacts from earthquakes on the operation and safety of the Pipeline. However, extensive information on the record related to earthquakes and tsunamis[424] supports the analysis in the DEIS and FERC's conclusion that Applicants' proposed construction and operation procedures, methods, and plans appropriately design for geological hazards and, through the implementation of minimization and mitigation measures, construction and operation of the Project would not significantly affect geology and would not be significantly affected by geologic hazards.[425] Applicants continue to review these comments which relate to the technical analysis in the DEIS and will provide a supplemental response as necessary. This supplement will refute claims made in DOGAMI's comments, and it will explain why the existing analysis, based on current standards and methods, is appropriate and reasonable.

The DEIS extensively evaluated the LNG Terminal's design to protect against tsunami inundation, flooding and sea level rise, hurricanes and storm surge, and seismic events to provide safety and protection to facility staff and the general public.[426] The LNG Terminal site will be elevated above the potential tsunami or storm surge run-up, so that equipment containing hazardous materials maintains its full integrity. The entire LNG Terminal is designed with a grade elevation intended to prevent inundation from the design tsunami wave height.

The LNG Terminal will be designed for seismic accelerations and wind loads in accordance with the applicable codes and standards,[427] as well as elevated above the potential tsunami or storm surge run-up, so that equipment containing hazardous materials maintains its full integrity. Regarding liquefaction and seismicity issues with the LNG Terminal site, Section 4.13.1.5 of the DEIS details soil densification, foundations, and other civil work and ground improvements designed to address seismic risks. As discussed therein, vibro-compaction will be the principal method utilized to condition soils that show potential for soil liquefaction under seismic activity. JCEP will use these methods, different piling solutions, and other proven methods of soil improvement as applicable to meet the LNG Terminal's seismic loading requirements.

Applicants disagree with many of DOGAMI's comments. Further, a significant number of DOGAMI's comments contain references to the Applicants' original resource reports from September 2017, rather than the DEIS, and deal with issues that were subsequently addressed in

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[423] *See, e.g.*, Comments of Waterkeeper Alliance, Accession No. 20190703-5041 at p. 1 (July 3, 2019) ("Waterkeeper Alliance Comments"); Comments of Timothy E. Cate, Accession No. 20190405-5101 at p. 1 (Apr. 5, 2019) ("Timothy Cate Comments"); *see also* Wim de Vriend Comments at pp. 8-9 (raising concerns related to tsunamis' impacts to LNG carriers in the port).

[424] *See* JCEP LNG Terminal Application, Resource Report 6; JCEP LNG Terminal Application, Resource Report 13; PCGP Application, Resource Report 6.

[425] DEIS at Section 4.1.4 at p. 4-40; *see generally* DEIS at Section 4.13.1.5.

[426] DEIS at pp. 4-12, 4-40, 4-734 to 4-740.

[427] *See generally* JCEP LNG Terminal Application, Resource Report 6; JCEP LNG Terminal Application, Resource Report 13; DEIS at Section 4.13.1.2; DEIS at pp. 4-733 to 4-734.

the DEIS. As noted above, Applicants are reviewing the comments from DOGAMI and others that relate to specific technical aspects of the DEIS, and will provide a supplemental response as necessary. However, given the progress made on the record, including updated analyses, since September 2017, Applicants will not respond to DOGAMI's comments on the adequacy of the resource reports.

B. **Blasting**

Certain commenters raise concerns related to blasting, arguing that there is a high likelihood that the proposed channel widening will involve underwater blasting to remove rock, which has the potential to permanently alter the bathymetry of Coos Bay and irreparably harm subtidal bedrock habitats.[428] Removal of bed materials at the four Navigation Reliability Improvement sites along the Federal Navigation Channel will be accomplished using mechanical or hydraulic dredging methods. Blasting at the Navigational Reliability Improvement areas is not in the proposed action. FERC Staff sufficiently analyzed the impacts from the four dredge areas and concluded that, even though the bathymetry is altered, the habitat remains the same, resulting in limited impacts during construction.[429]

C. **Terrain, Steep Slope, or Landslides**

Commenters assert that the Project may increase the risk of landslides in the Project area, which could result in erosion and/or subsequent stream and river pollution or blockage of water flow.[430] Others express concern regarding the presence of steep slopes on the Pipeline Route.[431] FERC Staff, in Section 4.1.2.4 of the DEIS, reviewed PCGP's route selection process, alignment of the Pipeline, and the modifications made to avoid landslide areas and areas susceptible to landslides. To minimize overall impacts, PCGP employed extensive routing and design efforts to ensure that the proposed route was feasible for the construction, safety, and reliability of maintaining and operating a large-diameter high pressure natural gas pipeline. The route was selected to ensure stability by avoiding landslides and areas of potential mass wasting and to minimize impacts to sensitive resources. The alignment follows ridgelines and slope contours where possible to ensure stability. FERC Staff evaluated Table B-2 from GeoEngineers (2017a), which indicates where reroutes were completed to avoid identified landslides. Similarly, FERC Staff evaluated Tables B-3a and B-3b from the same report, indicating where reroutes were incorporated into the proposed route to avoid moderate- and high-hazard RML hazard areas.[432] This evidence supports the DEIS's conclusion that "that construction and operation the Project would not be significantly affected by potential geological hazards including ground shaking, surface ruptures, soil liquefaction and lateral spreading, landslides, and slope failures."[433]

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[428] Comments of Oregon Shores, Accession No. 20190705-5176 at pp. 4-5 (July 5, 2019) ("Oregon Shores Comments").

[429] DEIS at p. 4-243. PCGP's ECRP was submitted as Appendix I to its Plan of Development. *See* Plan of Development of PCGP, Accession No. 20180123-5100 (Jan. 23, 2018) ("ECRP")

[430] Comments of Regna Merritt on behalf of 978 petition signees, Accession No. 20190627-5082 (June 27, 2019) ("Regna Merritt Comments").

[431] Comments of Cynthia Garrett, Accession No. 20190617-5181 at p. 3 (June 17, 2019) ("Cynthia Garrett Comments").

[432] DEIS at p. 4-22.

[433] *Id*. at p. 5-1.

The DEIS accurately notes that "the potential for construction-induced landslides would be avoided through appropriate construction techniques and [best management practices (BMPs)] included in the [Erosion Control and Revegetation Plan]."[434] Associated BMPs include, but are not limited to, sediment barriers (silt fence, straw bale, and straw wattle), slash-filter windrow, drivable berms/temporary sediment barriers adjacent to road crossings, temporary and permanent slope breakers, erosion control matting, trench breaker installation, and two-tone grading. Additional BMPs for steep side slopes requiring restoration are also included in the ECRP. In general, these additional BMPs include using well-drained structural fill placed in lifts and compacted for the side slope sites with gradients of 30 percent or greater. Each lift would be compacted by operating, hauling, and spreading equipment uniformly over the full width of each layer until there is no visible deflection under the load of the hauling and spreading equipment. If each lift of fill cannot be accessed by the hauling and spreading equipment to achieve compaction, then other suitable compaction equipment will be used to obtain the required compaction. Alternative compaction equipment and methods may include tamping with a trackhoe bucket, vibratory plate compactors (hoe-pack) or rollers.

D. **Other Geological Features**

One commenter raised concerns regarding boring under the Klamath Project.[435] These concerns have been, or will be, adequately addressed by PCGP's work with all affected irrigation districts in the Klamath Basin to address their specific concerns relative to the proposed Pipeline installation across Klamath Project facilities. All crossings of Reclamation facilities in the Klamath Project will be constructed in accordance with Reclamation's *Engineering and O&M Guidelines for Crossings*, December 2014 edition ("Reclamation Guidelines"). PCGP will also implement the Reclamation Guidelines for Pipeline installation in each of the affected irrigation districts.

As specified by the Reclamation Guidelines, PCGP will submit its Klamath Project Facilities Crossing Plan and the associated design package ("Design Submittal") for approval of the Klamath Basin Area Office. PCGP's Design Submittal will follow the Reclamation *Mid-Pacific Region Guidelines for the Review of Design Drawings and Specification and Oversight of Related Activities on Transferred Works*, April 2014. As requested by the Klamath Basin Area Office, all PCGP Design Submittals will utilize Reclamation form MP-620 – *Request for Review and Acceptance of Design Drawings and Specifications*. Submittal of the final Design Submittal will not occur until PCGP has contracted with an engineering, procurement, and construction contractor, who will be responsible for all final designs and submittals.

VI. ***Soils and Sediments***

A. **Erosion**

Some commenters express concern that Project activities would cause soil erosion.[436] The DEIS specifically analyzed potential impacts related to erosion, including turbidity, sedimentation,

[434] *Id*. at p. 4-22.
[435] Sandy Egleston Comments at p. 3.
[436] Oregon Physicians for Social Responsibility Comments at p. 3; Comments of Roberta Kaiser, Accession No. 20190627-0201 at p. 1 (June 26, 2019).

and channel and streambank integrity and stability.[437] The assessment included particular attention to streambank erosion and streambed instability potential at water crossings, and that analysis resulted in the application of additional best management practices at sites with greater erosion potential to protect stream and bank processes, as well as the development of specific crossing plans.[438] Additional efforts to minimize the impacts of erosion and sedimentation on surface waters, land-disturbing and construction activities would be conducted in compliance with the National Pollutant Discharge Elimination System (NPDES) Permit Number 1200-C for stormwater discharges during construction activities.[439] For example, the DEIS notes that erosion and sedimentation potential at the LNG Terminal site would be managed in accordance with a site-specific Erosion and Sediment Control Plan ("ESCP").[440] In all cases, the Applicants would install all necessary erosion and sedimentation control measures in compliance with the NPDES permits, as well as the provisions of FERC's Upland Erosion Control, Revegetation, and Maintenance Plan and FERC's Wetland and Waterbody Construction and Mitigation Procedures.[441]

Additionally, the DEIS includes numerous discussions regarding implementation of erosion and sediment control measures outlined in PCGP's ECRP that would be implemented through all phases of construction, including clearing and grading, as well as the restoration measures that would be implemented to enhance revegetation success on all lands crossed by the Pipeline.[442] The ECRP incorporates erosion control and revegetation recommendations provided by the USFS and BLM for their respective federally managed lands, and erosion control and revegetation guidelines provided by the Natural Resources Conservation Service (NRCS) have also been incorporated for use on private lands.[443]

B. **Dredging Sediments**

Several commenters express concern with the handling of dredged sediments, claiming that the DEIS does not adequately consider dewatering, the stability of the disposal locations, and impacts to adjacent wetlands.[444] A description of dredged and excavated material disposal for the Project is included in Section 2.1.1.8 of the DEIS. As stated in the DEIS, most of the material excavated and dredged during construction of the marine facilities would be used to raise the elevation of the terminal facilities above the tsunami inundation zone—the Ingram Yard, the access and utility corridor, and the South Dunes portions of the site, including temporary use areas, would receive material to raise their respective site elevations; and some material would also be deposited at the adjacent Roseburg Forest Products property, and at the Kentuck project mitigation

[437] *See, e.g.*, DEIS at pp. 4-57 to 4-59; 4-100 to 4-108; 4-266 to 4-268; 4-285 to 4-287.
[438] DEIS at pp. 4-101 to 4-102.
[439] *See* DEIS at p. 4-87.
[440] DEIS at pp. 4-254.
[441] See DEIS at p. 2-45.
[442] *See, e.g.*, DEIS at pp. 2-41 (discussing right-of-way revegetation and efforts to minimize runoff and sedimentation from access roads); 2-57 to 2-58 (discussing permanent erosion controls); 4-22 to 4-23 (discussing slope stability issues); 4-106 (considering the ECRP in the discussion of erosion impacts), 4-286 (considering the ECRP in the discussion of bank and bed erosion); 4-512 (considering the ECRP in analysis of surface erosion controls in a national forest).
[443] *See* PCGP's ERCP at 1.
[444] League of Women Voter Comments at pp. 30-31; Comments of Ann Turner, Accession No. 20190627-5025 at pp. 3-4 (June 26, 2019) ("Ann Turner Comments").

site.[445] Material dredged for the marine waterway modifications would be deposited at Al Pierce Company (APCO) Sites 1 and 2 or placed entirely at APCO Site 2 if shown to be feasible.[446]

To control upland soil erosion and potential sedimentation related to dredging activities, the DEIS considered as part of its analysis that JCEP would follow the measures outlined in its ESCP;[447] for marine waters, the DEIS considered as part of its analysis that JCEP would implement measures in its Dredge Material Management Plan.[448] As stated in the DEIS, implementation of JCEP's construction plans, including its ESCP, would prevent turbid water from on-land construction, dredge material placement, and slip formation to be discharged or allowed to flow into Coos Bay. All in-water work would be restricted to the in-water work window from October 1 to February 15, contributing to reducing effects on fish habitat and species.[449] Additionally, because all dredged material would be placed on land where runoff is controlled, there would be no effect on the estuary or marine environment from dredged material disposal.[450]

Dewatering and associated BMPs are outlined in the ESCP for the APCO 2 Site. This ESCP is included in JCEP's Dredging Pollution Control Plans, which were under development at the time of JCEP's application to the FERC but which JCEP anticipates submitting to the FERC in late July 2019 for consideration in preparation of the FEIS. These BMPs represent site-specific requirements imposed by ODEQ to meet the water quality requirements of the State of Oregon, including efforts to minimize potential impact of turbidity on all resources. BMPs to control runoff at the APCO Site 2 include, but are not limited to, construction of a disposal area levee (containment berm), discharge outfalls, cap/sediment traps, mulch / seed, truck wash-out facility, and discharge outfall weir.

Regarding stability concerns of the stockpiled dredge material, and effects on adjacent wetlands, JCEP's Dredging Pollution Control Plans reflect design choices that would address these concerns. For example, design of the containment berm at the APCO Sites will meet all local, state, and federal requirements. Use of USACE Dredge and Dredged Material Management Engineer Manual 1110-2-5025 for design criteria and ground improvements beneath the berm area would achieve the required safety factors for stability due to hydrostatic head levels and liquefaction. The dredged material would be deposited on land inside the containment berm to control runoff, and the berm would use outfall structures to minimize turbidity during the dredge slurry stacking and decant processes. The outfall pipes would be relocated frequently to allow for the even distribution of dredge spoils inside the containment berm and the collection and removal of decant water, thus further minimizing the potential for turbidity impacts to adjacent waters.

Commenters' concerns regarding impacts to adjacent wetlands from dredge disposal placement are unfounded, as no dredged material would be placed in wetlands at the APCO sites. The DEIS specifically considered temporary wetland impacts in the mudflat separating APCO Site

[445] DEIS at p. 2-16
[446] *Id*. at p. 2-17.
[447] *See id.* DEIS at p. 4-244. The DEIS refers directly to JCEP's ESCP, which is included as Appendix H.7 to JCEP Resource Report 7.
[448] *See* DEIS at p. 4-244. The DEIS refers directly to JCEP's Dredged Material Management Plan, which is included as Appendix N.7 to JCEP Resource Report 7.
[449] DEIS at p. 4-245.
[450] DEIS at p. 4-262.

1 and APCO Site 2, noting that less than one-tenth of an acre of estuarine wetlands would be impacted during placement of temporary bridge pilings.[451] The pilings would not impair flow or circulation. No permanent impacts to wetlands would result from Project activities at the APCO sites, and the DEIS has not overlooked the temporary impacts that would occur at and immediately adjacent to the APCO sites.

C. **Contaminated Soils and Sediments**

Some commenters express concern that dredging would stir up contaminated sediments from past industrial activities and that construction of the Project would expose toxic contaminants to the surrounding Coos Bay environment.[452] The DEIS explicitly considered the potential presence of contaminated soils and sediments, discussing potential contamination and the results of Phase I and Phase II Environmental Site Assessments associated with the LNG Terminal site in Section 4.2.1.2 of the DEIS, and results of sediment sampling from within Coos Bay starting in 2010 in Section 4.2.1.3 of the DEIS.[453] JCEP has performed extensive investigations regarding soil contamination throughout the LNG Terminal Project area, and as summarized in the DEIS, these investigations detected low levels of contamination in several areas of the LNG Terminal site.[454] The DEIS refers to JCEP's *Framework Contaminated Media Management Plan*, included as Appendix O.7 of Resource Report 7,[455] as the source of plans for how existing contaminants would be managed during construction as coordinated with the ODEQ.[456] If unanticipated soil contamination is discovered during construction of the LNG Terminal or use of the temporary construction areas, JCEP would abide by the conditions of the *Framework Contaminated Media Management Plan*. Any residually contaminated soil or sediment excavated during future site activities or development would be properly managed and disposed of in accordance with ODEQ regulations and the applicable permits. The DEIS provides a similarly defensible approach to the analysis of potentially contaminated sediments. The DEIS includes results of Portland Sediment Evaluation Team investigations as part of its assessment of contaminated soils and effects from the Project, and that team has repeatedly determined that sediments sampled from within Coos Bay are suitable for unconfined aquatic disposal and thus free from contamination risk.[457] In sum, the DEIS contains ample support for its conclusion that the Project is not anticipated to spread existing contamination, cause additional soil or sediment contamination, or create any risk to human health from the dredging or disposal of material.[458]

[451] DEIS Table 4.3.3.1-1 at p. 4-127.
[452] Comments of Patricia Kullberg, Accession No. 20190702-5015 at pp. 1, 7 (July 1, 2019) ("Patricia Kullberg Comments"); League of Women Voters Comments at pp. 35-36; Comments of William D. Merris Jr., Accession No. 20190411-0014 at p. 1 (Apr. 11, 2019) ("William Merris Comments").
[453] DEIS at pp. 4-44 to 4-50.
[454] DEIS at pp. 4-45 to 4-46.
[455] JCEP Resource Report 7 at Appendix O.7.
[456] *See* DEIS at p. 4-48.
[457] *See* DEIS at pp. 4-49 to 4-50.
[458] DEIS at pp. 4-49.

VII. *Water Resources and Wetlands*

A. **Drinking Water Supplies**

Several commenters claim that Pipeline routing, Pipeline river-crossings, and the spread of chemicals used during construction could harm drinking water supply sources.[459] Section 4.3.2.2 of the DEIS discusses Pipeline stream crossings, potential impacts, and mitigation measures to protect public drinking water supplies (including 12 identified surface water drinking water source areas).[460] The DEIS considered in its analysis that PCGP would implement its ECRP[461] to minimize potential adverse impacts along the construction right-of-way and at waterbody crossings during construction, restoration, and operation of the Pipeline.[462] Regarding potential impacts to channel stability, turbidity, sedimentation, and other mechanisms that Pipeline construction could affect a water supply intake, the DEIS discusses Project-specific stream crossing evaluations performed on streams suitable for this analysis following the U.S. Fish and Wildlife Service ("USFWS") Stream Crossing Screening Matrix, which included initial stream assessments and follow-up surveys, and which led to BMPs being incorporated for streams in certain risk categories (in addition to the use of BMPs that are industry standard for the conditions identified).[463]

Some commenters expressed concern regarding impacts from herbicides on surface waters used for drinking water.[464] The DEIS confirms that herbicides would not be applied by aerial or broadcast spraying, and would not be used in or within 100 feet of a waterbody's mean high-water mark or in certain riparian zones.[465] Sections 4.4.2.5 and 4.5.2.3 of the DEIS address the use of herbicides where necessary for targeted control of noxious species post-construction.

As stated in the DEIS, prior to construction, PCGP would consult with active surface water intake operators and establish a process for advanced notification of instream work.[466] A summary of these consultations would be filed with FERC prior to construction of the Pipeline. The DEIS considered in its analysis of potential impacts that, in the event of an inadvertent spill, a disruption of flow, or a possible introduction of sediments into waters upstream of the intakes, PCGP would notify potable water intake users of the conditions so that necessary precautions could be implemented.[467] Implementation of the ECRP, standard BMPs, site-specific additional BMPs, and construction monitoring would minimize the potential for impacts on public surface water supplies to occur during construction. Pre-construction consultation with suppliers would facilitate a quick response in the unlikely event an impact on a water intake occurs during construction. As the DEIS notes, if Pipeline construction results in impacts on a water supply's point of diversion,

[459] Comments of Doro Reeves, Accession No. 20190513-5000 at p. 1 (May 11, 2019); John Clarke Comments at p. 2; Cynthia Garrett Comments at pp. 1-2; Waterkeeper Alliance Comments at p. 1; *see generally* Regna Merritt Comments.
[460] DEIS at pp, 4-96 to 4-97, 4-100 to 4-4-118.
[461] PCGP's ECRP.
[462] DEIS at p. 4-100.
[463] DEIS at pp. 4-100 to 4-102.
[464] Bill Gow Comments at pp. 3-4; McLaughlin July 3 Comments at pp. 2-3.
[465] *See* DEIS at pp. 2-71, 4-303.
[466] DEIS at p. 4-117.
[467] *Id*. at pp. 4-117 to 4-118.

PCGP would work with the landowner to ensure a temporary water supply, and if deemed necessary, PCGP would provide a permanent replacement water supply.[468]

Neither would the Project significantly affect Wellhead Protection Areas or groundwater wells, which are discussed in Section 4.3.1.2 of the DEIS. The DEIS included in its analysis that PCGP would implement its *Groundwater Supply Monitoring and Mitigation Plan*[469] within 200 feet of any springs, seeps, and wells to protect groundwater resources.[470] The DEIS also discusses PCGP's implementation of its *Spill Prevention, Control, and Countermeasure Plan* (SPCC)[471] to minimize the potential for contamination of groundwater from inadvertent release of equipment related fluids.[472] In addition, the DEIS notes that PCGP would work with individual landowners to ensure that water supply wells are protected during and following construction, and if a groundwater supply is affected by construction, PCGP would work with the landowner to provide a temporary supply of water, and if necessary, a permanent water supply to replace the affected groundwater supplies.[473]

Based on employing all of the above noted measures, the DEIS contains ample support for its conclusion that the Project would not significantly affect impacts on public surface water supplies are anticipated.[474]

B. Potential Damage to Oregon Waterbodies and Wetlands

Numerous commenters raised concerns with potential impacts on water quality, relying in particular on aspects of ODEQ's review of the Project regarding water quality impacts from erosion, turbidity, sedimentation, contaminants, issues associated with Total Maximum Daily Loads ("TMDLs"), and similar concerns.[475] Underlying many of these comments is the general assertion that the Project would damage and pollute Oregon waters and permanently impact wetlands.[476]

As an initial matter, the Applicants are working with the ODEQ as Applicants prepare to submit a new request for water quality certification, pursuant to Section 401 of the Clean Water Act, following ODEQ's denial, without prejudice, of the Applicants' previous request. Discussions between the Applicants and the ODEQ center on resolving agency concerns identified in ODEQ's May 2019 denial letter, which ODEQ incorporated into its comments on the DEIS.[477]

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[468] *Id*.at p. 4-118.
[469] The Groundwater Supply Monitoring and Mitigation Plan was included as Appendix F.2 to PCGP Resource Report 2.
[470] *Id*.at p. 4-79.
[471] The SPCC was included as Appendix B.2 to PCGP Resource Report 2.
[472] DEIS at p. 4-81.
[473] *Id*.at pp. 4-81 to 4-82.
[474] *Id*.at p. 4-118.
[475] *See, e.g.*, Comments of Oregon Wild, Accession No. 20190702-5155 at pp. 9-10 (July 2, 2019); Jackson County Comments at p. 9; Comments of Cary and Karen Dohler Norman, Accession No. 20190703-5032 at pp. 2-3 (July 2, 2019); Ann Turner Comments at pp. 3-4.
[476] *See, e.g.*, Comments of 1,424 individual supporters of the Center for Biological Diversity, Accession No. 20190703-5157 (July 3, 2019) ("Center for Biological Diversity Comments"); Oregon Wild Comments at pp. 9-10; WELC Comments at pp. 63-76.
[477] Oregon State Agencies Comment at p. 20, Appendix C, Appendix D.

The Applicants addressed a majority of these concerns in materials submitted to ODEQ that ODEQ had not yet reviewed when it issued its May 2019 denial.

The DEIS assesses the potential impact of the Project on numerous water quality characteristics: turbidity and sedimentation;[478] temperature, chemical, and biological effects;[479] and potential impacts from spills, leaks, or the presence of contaminated water or sediments.[480] The DEIS specifically considered impacts on water quality from JCEP activities at the LNG Terminal from dredging in Coos Bay, propeller wash and wave effects from LNG carriers and tug boats, and LNG carrier discharges of ballast water and engine cooling water.[481] The DEIS also analyzed potential impacts from PCGP activities related to sedimentation risks from streambank erosion and scouring, runoff potential at construction sites and new road/stream crossings, potential impacts from HDD operations and inadvertent returns, use and discharge of water for hydrostatic testing and dust suppression, and stream temperature impacts from clearing in riparian areas.[482] Several of these water quality characteristics are even further analyzed in other sections of the DEIS, such as consideration of water quality impacts in the context of the Northwest Forest Plan's Aquatic Conservation Strategy ("ACS"), stream temperature issues on BLM and Forest Service lands, and water quality impacts on species in Coos Bay and in waterbodies crossed by the Pipeline.[483]

The DEIS is similarly comprehensive regarding potential impacts to wetlands.[484] The DEIS determined that construction of the LNG Terminal would result in the loss of 22.3 acres of wetlands and temporary impacts on 86.1 acres of wetlands, and that these impacts would be mitigated through the restoration and enhancement of 91.5 acres of wetlands at the Kentuck site, as well as another 9.3 acres of eelgrass mitigation.[485] As the DEIS discusses, construction of the Pipeline would impact 112.2 acres of wetlands, with only 4.9 acres impacted by operations.[486] The DEIS identifies numerous mitigation measures that would be implemented to address impacts to wetlands, including a discussion of the Applicants' Compensatory Wetland Mitigation Plan,[487] and the DEIS appropriately recognizes that additional mitigation may be required as part of other agency approvals, such as the U.S. Army Corps of Engineers and the Oregon Department of State Lands.[488]

The DEIS includes in its analysis the implementation of plans developed by the Applicants, in coordination with the applicable regulatory agencies, to minimize impacts on wetlands and waterbodies. Examples include the ECRP, Hydrostatic Test Plan, Integrated Pest Management

[478] *See* DEIS at pp. 4-83 to 4-87, 4-100 to 4-108, 4-116 to 4-117.
[479] *See id*. at pp. 4-88 to 4-92, 4-114 to 4-117.
[480] *See id*. at pp. 4-87 to 4-88, 4-95 to 4-96, 4-116.
[481] *See id*. at pp. 4-84 to 4-91.
[482] *See id*. at pp. 4-100 to 4-118.
[483] *See id*. at pp. 4-136 to 4-143, 4-229 to 4-304, 4-497 to 4-515.
[484] *See id*. at pp. 4-127 to 4-134.
[485] *Id*. at 4-127 to 4-130 and Applicants' DEIS Comments at Attachment B, p. 33. Although the DEIS notes that approximately 7.7 acres would be enhanced at the Eelgrass Mitigation site, Applicants submitted comments on the DEIS to revise this number to reflect the Compensatory Mitigation Plan, filed on January 29, 2019.
[486] DEIS at 4-132 to 4-133.
[487] Supplemental Information, Compensatory Wetland Mitigation Plan, Docket Nos. CP17-494-000 and CP17-495-000, submitted on January 1, 2019.
[488] *See* DEIS at 4-129 to 4-130, 4-133 to 4-134.

Plan, Overburden and Excess Material Disposal Plan, SPCC Plan, and Wetland and Waterbody Crossing Plans[489]. Additionally, PCGP has incorporated horizontal directional drill (HDD) crossings where feasible to avoid direct in-water impacts and developed an HDD Drilling Fluid Contingency Plan (Section VII.C, below).

Overall, the DEIS notes that the Project would result in permanent effects to about 27 acres of wetlands, with 99.1 acres of mitigation provided.[490] These impacts do not amount to wide-scale degradation, and the DEIS's conclusions that the Project would not significantly affect water quality or wetlands has ample support in the record.

Some commenters are particularly concerned with water quality impacts from hydrostatic testing, with a focus on water sourcing, discharge locations, and drought conditions.[491] The DEIS addressed the volumes, sourcing, and discharge locations for hydrostatic test water, and it appropriately incorporates by reference PCGP's Hydrostatic Test Plan designed to minimize impacts from this testing.[492] The DEIS also notes that water withdrawals would be governed by appropriations and withdrawal permits issued from the Oregon Water Resources Department that would respect priority and would protect existing users during times of limited water supply.[493] Commenters' concerns with potential impact on water quality and wildlife impacts would be addressed through review with relevant state agencies such as the Oregon Department of Fish and Wildlife regarding fish entrainment and potential effects on fish habitat, and the DEIS appropriately recognizes these mechanisms in its effects analysis. Concerns regarding the potential use of chlorine to treat water to prevent the spread of invasive species and pathogens would be subject to ODEQ review and requirements, which the DEIS notes are part of the Hydrostatic Testing Plan.[494] The DEIS specifically discusses the potential effects of these chlorine treatments and discharge locations.[495]

Other commenters are specifically concerned with groundwater impacts at marshes (such as Henderson Marsh).[496] The DEIS acknowledges potential effects to Henderson Marsh (which is immediately west of the LNG Terminal) and other areas in the immediate vicinity of the LNG Terminal. The DEIS discusses the shallow depth to groundwater at the LNG Terminal site, the permeability of overlying sands and gravels, and the resulting potential temporary and localized effects on groundwater movement during dewatering and excavation of the marine slip.[497] The DEIS also specifically notes that the Henderson Marsh may be affected by a minor reduction in water entering the marsh from the construction of the tsunami berm on the west side of the slip.[498] The DEIS cites to a 2017 groundwater study commissioned to evaluate the potential for dewatering activities during construction of the LNG Terminal to impact nearby groundwater users or to

[489] *See, e.g.*, DEIS at 4-57, 4-111, 4-167, 4-453 to 4-454.
[490] DEIS at 4-128, 4-130, 4-132.
[491] League of Women Voters Comments at p. 53; Snattlerake Comments at 9; Niskanen Center Comments at 12.
[492] *See* Applicants' DEIS Comments at Attachment B at 49-50.
[493] *See* DEIS at 4-298.
[494] DEIS at 4-109 and 4-111.
[495] *See* DEIS at 4-210 (impacts to terrestrial wildlife), 4-271, 4-298, and 4-301 (discussion of nuisance species and pathogens),
[496] Comment of Clarence and Stephany Adams, Accession No. 20190703-5053 (July 3, 2019); Comment of USEPA, Accession No. 20190708-5022 (July 5, 2019).
[497] DEIS at 4-76 and 4-77.
[498] DEIS at 4-128.

change the hydrology of aquatic resources, including wetlands and dunal lakes (includes Henderson Marsh).[499] That study estimates the magnitude and timing of dewatering-induced groundwater drawdowns in the vicinity of aquatic resources and water wells, and it evaluates the potential impacts to each including biological considerations. In sum, the DEIS considered potential impact at marshes and have sample support for its conclusions of minor impacts to groundwater and marshes near the LNG Terminal.

Some commenters raise concerns that LNG carrier ships would introduce invasive aquatic organisms that would harm Coos Bay, and that this issue is ignored in the DEIS.[500] To the contrary, the DEIS specifically discusses the potential for the introduction of nuisance species from LNG carrier ballast water discharges.[501] The DEIS analysis is not deficient because, as some commenters claim, it recognizes the imposition of certain performance standards (discussed in the DEIS as "D-1" and "D-2" performance standards) on LNG carriers likely to call on the Project. The DEIS reasonably determined that most ships that would call on the Project when it becomes operational in 2023 at the earliest would conform to the more stringent D-2 standards that protect against the introduction of nuisance species.[502] Furthermore, the DEIS considers the potential impacts of nuisance species introduced through ballast water even in the absence of all ships conforming to the D-2 standard. In this context, the DEIS discusses the application of the D-1 standards, as well as the 2012 USCG Final Rule on Ballast Water Discharges on all LNG carriers that would call on the Project, that require ships to exchange ballast water well in advance of entering the port[503] or using one of several USCG-approved ballast water management methods. In addition, the DEIS incorporates into its analysis the implementation of the requirements for all newly built large vessels to have systems that treat ballast water to kill potential non-native invasive species.[504] The DEIS does not ignore the potential for nuisance species introduced through ballast water exchanges; rather, it adequately discusses potential impacts.

C. **Inadvertent Returns of Drilling Fluids from Horizontal Directional Drilling**

Some commenters expressed concern regarding inadvertent returns of drilling fluid from HDD operations, claiming that the DEIS underestimates potential contamination and fails to adequately discuss aquatic impacts, containment efforts, and remediation strategies.[505] HDD construction, potential impacts, and mitigation are identified in Sections 2.4.2.2, 4.3.2.2, 4.5.2.3, and 4.9.2.8 of the DEIS. In particular, the DEIS addresses displaced soil and return flow of bentonite slurry associated with HDD as a potential source of sediment from HDD crossings in Section 4.5.2.3.[506] The DEIS provides an appropriate and reasoned analysis of potential contamination associated with inadvertent returns of drilling fluids during HDD operations. As

[499] DEIS at 4-128.
[500] WELC Comments at 72-73; Comment of William D. Merris Jr., Accession No. 20190411-0014 (Apr. 11, 2019).
[501] DEIS at 4-88 to 4-90, 4-238.
[502] *See* DEIS at 4-90.
[503] DEIS at 4-89.
[504] DEIS at 4-90.
[505] Comment of Trout Unlimited, Accession No. 20190703-5147 (July 3, 2019); Comment of Patricia Kullberg, Accession No. 20190702-5015 (July 1, 2019); WELC Comments at pp. 77-78; Comment of Katy Mallams, Accession No. 20190523-0010 (May 23, 2019); Comment of Klamath Tribes, Accession No. 20190705-5048 (July 4, 2019).
[506] *See* DEIS at 4-269 to 4-270.

explained in the DEIS,[507] PCGP completed HDD and Direct Pipe feasibility analyses[508] and developed an HDD Drilling Fluid Contingency Plan[509] to ensure that the potential for an inadvertent release of drilling fluid is minimized.

One commenter challenges the DEIS's statement regarding the likely dilution of drilling fluids that reach large water bodies or swift flowing rivers.[510] The DEIS specifically considered potential aquatic impacts and did not simply assume that all impacts would be ameliorated by dilution. For example, the DEIS considered impacts of bentonite sediment interfering with oxygen exchange, vision, and feeding of aquatic species; the potential of drilling fluid covering benthic organisms and estuarine food sources; and particular impacts on spawning habitat, eggs, and juvenile survival.[511] The DEIS notes that although much of any released bentonite would likely remain suspended and therefore ameliorated by tidal exchange or river flow, some could settle and then be contained and removed.[512] Indeed, the *Drilling Fluid Contingency Plan for Horizontal Directional Drilling Operations* referred to in the DEIS specifically discusses how returns in some areas, such as the intertidal mud flats in Coos Bay, could be contained and removed.[513]

One commenter claims that the DEIS fails to adequately discuss remediation activities, and that treatment plans should be in place prior to a release, not after.[514] The DEIS describes a host of response measures that would be implemented to address an inadvertent return.[515] It is not feasible to develop site-specific response plans or site-specific impact analysis given the inability to predict where an inadvertent return might occur along the varied topography of the HDD alignment. However, as noted in the DEIS, PCGP would actively monitor drilling activity to detect pressure drops and potential inadvertent returns in order to stop drilling operations and to commence response actions, and would use on-site environmental inspectors to monitor erosion controls and to direct repairs or the installation of additional controls as necessary based on site conditions.[516]

D. **Mitigation**

As described above, the DEIS notes that the Project would result in permanent effects to about 27 acres of wetlands and eelgrass beds, with 99.1 acres of mitigation provided.[517] Some commenters claim that the proposed compensatory mitigation is insufficient to compensate for the reasonably expected adverse impacts of the Project on water and wetlands resources.[518] As noted above and in the DEIS, the U.S. Army Corps of Engineers and the Oregon Department of State Lands would determine the specific type and amount of compensatory mitigation that would be required to offset the loss of wetland acreage and functions as part of the Clean Water Act Section

[507] DEIS at 4-270.
[508] Appendix G.2 of Resource Report 2, Docket No. CP17-494-000, submitted September 21, 2017.
[509] Appendix H.2 of Resource Report 2, Docket No. CP17-494-000, submitted September 21, 2017.
[510] Comment of Trout Unlimited, Accession No. 20190703-5147 (July 3, 2019).
[511] DEIS at 4-268 to 4-270; 4-284 to 4-285.
[512] DEIS at 4-269.
[513] See PCGP's Resource Report 2, Appendix H.2, Accession No. 20170921-4010 (Sept. 21, 2017).
[514] Comment of Trout Unlimited, Accession No. 20190703-5147 (July 3, 2019).
[515] *See* DEIS at 4-270.
[516] DEIS at 4-270.
[517] DEIS at 4-128, 4-130, 4-132, 4-187.
[518] *See, e.g.*, Comment of James Fereday, Accession No. 20190624-5027 (June 23, 2019).

404 permitting process and the Oregon removal-fill permit process.[519] The DEIS's discussion of impacts as offset by proposed mitigation is not deficient, notwithstanding the additional mitigation requirements that these agencies may impose using authorities outside of NEPA.

The DEIS incorporates by reference the Applicants' Compensatory Wetland Mitigation Plan filed with FERC and notes that it accounted for the short-term and permanent impacts of the Project and provides mitigation that offsets these impacts.[520] As discussed at length in that plan, the proposed mitigation at the Kentuck site would restore tidal and freshwater floodplain hydrologic function to the existing degraded wetlands by removing existing levees and regrading the site.[521] The mitigation acreage discussed in the DEIS relates to the Applicants' efforts to restore tidal connectivity to historic tide lands within the former golf course site, which would result in a diverse array of habitat types including mudflat, tide channels, salt marsh, and fringing freshwater wetlands. The DEIS refers to Table 4 of the Compensatory Wetland Mitigation Plan, which notes that approximately 91 acres of construction would be undertaken to achieve this goal, including approximately 18 acres of voluntary habitat improvements above the minimum requirements (based on a 3:1 ratio, where 3 units of enhanced wetlands are provided to complete for each unit of impacted wetlands). Additionally, this mitigation effort would provide substantially more vegetated habitat (e.g., salt marsh) than the minimum required because of salt marsh's higher productivity and historical loss within the watershed relative to mudflat. Pipeline wetland impacts would be compensated for by restoring ecological processes along a reach of Kentuck Creek and its adjacent, diked and grazed wetland floodplain. This would entail re-establishing floodplain connection with the historical floodplain adjacent to Kentuck Creek and establishing a mix of forested and scrub-shrub wetland habitats. As shown in Table 4 of the Compensatory Wetland Mitigation Plan, approximately 9.14 acres of mitigation would be undertaken to achieve this goal, including 6.41 acres of voluntary habitat improvements (above the minimum mitigation requirements). Based on the final wetland surveys and jurisdictional determinations if additional wetland mitigation is necessary, the 6.41 acres of voluntary habitat improvements at the Kentuck site would be used to offset any additional impacts requiring mitigation.

The DEIS is particularly justified in its conclusion that adequate mitigation is provided for the very small losses of wetlands associated with the Pipeline, which totals only 0.9 acre of permanent impacts over 229 miles of Pipeline. As indicated in the Compensatory Wetland Mitigation Plan, other impacts to wetlands requiring mitigation consist of small impacts spread over 229 miles in multiple watersheds where most impacts would be less than 0.1 acre and not in the service area of mitigation banks; therefore, it is not practical to provide local mitigation for each impact.[522] In addition, these impacts would primarily stem from a conversion of the type of wetland, and not permanent loss, since the wetlands would remain following construction, with functional losses being offset at the consolidated Kentuck site. In sum, the DEIS's assessment of proposed mitigation is amply supported in the record.

[519] DEIS at 4-129.
[520] DEIS at 4-130.
[521] *See* Attachment FERC-JCEP-RR2-1 in the Response to April 20 Data Request of Jordan Cove Energy Project L.P. under CP17-495, Accession No. 20180510-5165 at 4 (May 10, 2018) ("Compensatory Wetland Mitigation Plan").
[522] Compensatory Wetland Mitigation Plan at 25.

Some commenters raise concerns that the eelgrass mitigation site would most likely result in a net loss.[523] The DEIS and the referenced Compensatory Wetland Mitigation Plan explain how impacts to eelgrass from construction of the LNG Terminal would be mitigated at the Eelgrass Mitigation site, which is designed to establish a population of eelgrass equivalent to the impact acreage, plus the addition of a prescribed 3:1 regulatory ratio.[524] The DEIS and Compensatory Wetland Mitigation Plan provide ample support for the Eelgrass Mitigation site providing a greater acreage of restored eelgrass habitat than that impacted by the LNG Terminal.

One commenter claims that the eelgrass mitigation goals are too aspirational, particularly since Applicants rely on coverage and density as proxies for habitat function.[525] The Compensatory Wetland Mitigation Plan's use of this methodology, and the DEIS's reliance on that approach, represent a reasonable approach in the absence of an approved approach to measuring eelgrass function. As the Compensatory Wetland Mitigation Plan notes, the National Oceanic and Atmospheric Administration recommends using eelgrass distribution and density as a proxy for eelgrass habitat function in a 2014 policy document for use in California.[526] On this basis, eelgrass density and coverage data were collected from existing eelgrass beds within the proposed Access Channel and a selected reference site, and these metrics would be used as performance criteria to measure acceptable development of the eelgrass community at the mitigation site during the 5-year post-construction monitoring program.[527]

A commenter claims that the eelgrass bed location is in a depression and questions the adequacy of tidal flows through the site.[528] The DEIS explicitly acknowledges that the Compensatory Wetland Mitigation Plan is subject to final approval by resource agencies and that consultation is ongoing regarding refinements to the final mitigation plan.[529] As described in Section II.H, the DEIS is not rendered inadequate simply because the DEIS incorporates mitigation measures that are still in development. Here, for example, the Applicants continue to work with the resource agencies to refine the eelgrass bed design, including modifications that address the commenter's concerns. Indeed, Applicants plan to modify the current design to open the west end of the site and merge the -1.3-foot MLLW contour with the existing -1.3-foot line, which empties into an existing channel that trends to the southwest. The maximum depths of the existing channel are -3.8 feet MLLW. This modification will allow the site to drain and fill with each tidal cycle, alleviating the potential issues of stagnant water at lower tidal elevations.

One commenter suggests that the Kentuck site should not use dredged dune sand at the mitigation site because it is unlike the natural cohesive muds, silts, and clays that comprise salt marsh soils.[530] As the Compensatory Wetland Mitigation Plan describes, the purpose of elevating existing grades at the Kentuck site is to allow for a more complex array of habitats to establish,

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[523] *See, e.g.*, Comment of James Fereday, Accession No. 20190624-5027 (June 23, 2019); Comment of Nancy Shinn, Accession No. 20190514-5058 (May 14, 2019).
[524] DEIS at 4-130, 4-187, 4-241 to 4-249; Compensatory Wetland Mitigation Plan at 5-7, 10-12,
[525] Comment of James Fereday, Accession No. 20190624-5027 (June 23, 2019).
[526] National Oceanic and Atmospheric Administration, California Eelgrass Mitigation Policy and Implementing Guidelines (2014).
[527] *See* Compensatory Wetland Mitigation Plan at 10-12, 47-48.
[528] Comment of James Fereday, Accession No. 20190624-5027 (June 23, 2019).
[529] DEIS at 4-245.
[530] Comment of James Fereday, Accession No. 20190624-5027 (June 23, 2019).

including high and low salt marsh, fringing freshwater wetland, mudflats, and tide channels.[531] Wetland delineations and general field observations on the north spit show that salt marsh as well as freshwater wetland vegetation readily establishes in the sandy soils in those areas.[532] Furthermore, the approach at Kentuck is to scrape and stockpile the upper portion of the existing soil surface to then reapply it to the final graded surface, and the reused topsoil will be partially tilled into the sandy dredge material to provide an even transition from native silt loam to sandy material.[533]

A commenter also expressed concern that sea level rise was not considered in the mitigation design.[534] As described in the Compensatory Wetland Mitigation Plan, the design incorporated projected sea level rise into the design elevations for perimeter infrastructure (e.g., the access road).[535] Further incorporation of sea-level rise into adaptive management has not been conducted, since the typical site monitoring period is 5 years, which is not long enough a period to experience significant sea level rise. Once established, the site is intended to function like other salt marsh/mudflat habitats within the bay and will respond to sea level rise similarly.

VIII. *Land Use*

A. Residential Areas

Some commenters express concerns regarding temporary and permanent impacts to their properties from Pipeline construction, including disturbance from construction workers and construction equipment in close proximity to residences and permanent property damage.[536] The DEIS specifically considered potential impacts to these properties and identifies measures to minimize construction disturbance on residences in Sections 4.7.1.3 and 4.7.2.4. In particular, the DEIS discussed PCGP's development of site-specific drawings for residences within 50 feet of construction work zones and the special construction techniques and mitigation measures designed to minimize disturbance to these residents.[537] For example, the DEIS notes that PCGP would provide alternative sewer facilities if a septic system or related feature is disturbed during construction and would repair and restore septic systems affected by construction.[538] PCGP would preserve trees, vegetation, and landscaping where possible and will restore all lawn areas and landscaping within the construction work area.[539] Landowners would be compensated for the removal of any trees.[540] Other impacts on landscape plantings, where unavoidable, would be

[531] Compensatory Wetland Mitigation Plan at 7.
[532] Compensatory Wetland Mitigation Plan at 27.
[533] Compensatory Wetland Mitigation Plan at 16.
[534] Comment of James Fereday, Accession No. 20190624-5027 (June 23, 2019).
[535] Compensatory Wetland Mitigation Plan at 15, 17.
[536] Comment of Joan Dahlman, Accession No. 20190613-5017 at p. 2 (June 12, 2019) ("Joan Dahlman Comments"); Comment of Mitzi Kay Sulffridge, Accession No. 20190705-5209 at p. 4 (July 5, 2019) ("Mitzi Kay Sulffridge Comments"); Comment of Dr. Edgar Maeyens, Accession No. 20190614-0007 (June 14, 2019).
[537] DEIS at 4-420.
[538] DEIS at 4-420.
[539] DEIS at 4-420.
[540] DEIS at 4-420.

addressed in agreements with individual landowners.[541] The DEIS incorporated these various mitigation measures into its analysis.

The DEIS also includes numerous general measures to be implemented to reduce effects on residential property.[542] Landowners would be notified at least 45 days prior to construction via US Mail and telephone.[543] Within 50 feet of residences, the edge of the construction work area would be fenced for a distance of 100 feet on either side to ensure that construction equipment and materials, including the spoil pile, remain within the construction work area.[544] Fencing would be maintained, at a minimum, throughout the open trench phases of pipeline installation.[545] Where possible, the width of the construction ROW would be reduced near residences, and TEWAs would be located as far away from residences as practical. PCGP would also limit the period of time the trench remains open prior to backfilling in residential areas. PCGP has developed and will implement the Landowner Complaint Resolution Procedures for the Project, as stated in the DEIS.[546] Again, the DEIS acknowledges implementation of these measures when considering potential impacts to residences.

Commenters also expressed concerns regarding disruption of access to homes during construction and road damage from heavy equipment.[547] As stated in the DEIS, PCGP would maintain access and traffic flows in residential areas during construction, particularly for emergency vehicles, and access to residences will be maintained at all times.[548] The DEIS also notes that PCGP would implement the measures in its Transportation Management Plan to reduce impacts on affected roads and users.[549] Additionally, construction contractors would be required to follow the Traffic Management Plans for the Project and to comply with speed limits. Residential driveways would be restored post-construction.[550] Local roadways affected by the Project would be maintained during construction and restored post-construction in accordance with the applicable permits from the state agency.[551]

One commenter raises concerns regarding landowner notice of hydrostatic break testing and potential damage from such testing.[552] As stated in the DEIS, landowners would be notified at least 45 days prior to construction, which includes hydrostatic break testing.[553] The hydrostatic test water would be discharged in upland areas into erosion control devises typically constructed of hay bales and silt fence to minimize potential for scour and erosion, in accordance with PCGP's

[541] DEIS at 2-63.
[542] DEIS at 4-420 to 4-421.
[543] DEIS at 4-20.
[544] DEIS at 4-420.
[545] DEIS at 4-420 to 4-421.
[546] DEIS at 4-420.
[547] Comment of Dr. Edgar Maeyens, Accession No. 20190614-0007 (June 14, 2019); Mitzi Kay Sulffridge Comments at p. 4; Comment of Darcy Gunnell, Accession No. 20190705-5086 (Jul. 4, 2019); Joan Dahlman Comments at p. 2; Comment of Frank Adams, Accession No. 20190426-5112 (Apr. 26, 2019); Comment of Craig and Stacey McLaughlin, Accession No. 20190703-5206 (July 3, 2019).
[548] DEIS at 4-420.
[549] DEIS at 4-627.
[550] DEIS at 4-420 to 4-421.
[551] DEIS at 4-627.
[552] Mitzi Kay Sulffridge Comments at p. 3.
[553] DEIS at 4-420.

Erosion Control and Sedimentation Plan and Hydrostatic Testing Plan.[554] Hydrostatic test water discharge would be monitored by the construction contractor and overseen by the Environmental Inspector.[555] The dewatering structures will be placed in upland locations that are topographically appropriate to allow the flow to "pool" and dewater uniformly through the structure to promote infiltration of water.[556] In sum, the DEIS provides ample support for its conclusion that based on the proposed mitigation and minimization measures, the Project would not significantly affect residential land use.

B. Future Land Use

Several commenters express concerns regarding limitations on the use of their property because of the presence of the pipeline.[557] As stated in the DEIS, PCGP would negotiate with landowners and provide compensation for temporary and permanent affects, including timber and crop losses or land taken out of productive use as a result of pipeline construction.[558] Affected landowners would have use of the right-of-way after construction, provided it does not interfere with the easement rights granted to PCGP for construction and operation of the Pipeline.[559] In response to comments from landowners, PCGP has incorporated numerous route modifications to avoid planned improvements on parcels.[560]

Some commenters also express concern regarding the need to coordinate over the life of the Project with PCGP for heavy equipment crossing the Pipeline.[561] The DEIS addresses this concern by stating that ROW crossing locations would be designated for heavy equipment.[562] No coordination with PCGP would be required for these locations, provided that the load or equipment does not exceed the agreed upon load and pressure limits.[563] If an interested party has the need to cross the ROW with a load or equipment exceeding the agreed upon load and pressure limits, the interested party would be able to coordinate those crossings with PCGP and safety precautions would be implemented to protect the integrity of the pipeline.[564]

C. Livestock and Agriculture

Some commenters expressed concerns regarding livestock fencing during construction of the pipeline.[565] The DEIS addresses livestock fencing is addressed in Section 4.7.2.2. Landowners and fence owners would be notified prior to disturbance of any fencing and provided with an

[554] DEIS at 2-56, 4-285 to 4-286.
[555] DEIS at 4-109.
[556] DEIS at 4-301.
[557] Comment of Don and Shirley Fisher, Accession No. 20190610-5105 at pp. 1-2 (June 10, 2019) ("Don and Shirley Fisher Comments"); Mitzi Kat Sulffridge Comments at pp. 1-2.
[558] DEIS at 2-39; 4-60 to 4-61.
[559] DEIS at 2-39.
[560] DEIS at 4-421.
[561] Don and Shirley Fisher Comments at pp. 1-2; Comments of Cynthia Garrett, Accession No. 20190617-5181 (Jun. 17, 2019); Snattlerake Comments at p. 8.
[562] DEIS at 4-9.
[563] DEIS at 4-9.
[564] DEIS at 4-418.
[565] Cynthia Garrett Comments at p. 1; Snattlerake Comments at pp. 6-7.

opportunity to remove livestock from the construction ROW.[566] During clearing, existing fences crossed by the Pipeline route would be cut, braced, and secured to prevent slack wires, and temporary gates installed to control livestock access to the right-of-way.[567] The DEIS specifically notes that PCGP would erect temporary fences and gates to landowner specifications, and if construction activities break or destroy a natural barrier used for livestock control, gaps would be temporarily fenced to prevent passage of livestock.[568] After construction, fences, gates, and cattle guards, including any natural barriers broken, would be restored to their original state as soon as practical.[569]

One commenter expresses concern over long-term aerial surveys of the pipeline for maintenance that may "spook" livestock and cause damage.[570] As stated in the DEIS, aerial surveys would be conducted in compliance with USDOT requirements and would not occur at an altitude that would disrupt livestock.[571] Additionally, PCGP would implement its Air Noise and Fugitive Dust Control Plan to mitigate any potential impacts from aerial surveys.[572]

IX. *Recreation and Visual Resources*

A. Vessel Traffic Impacts

Some commenters have alleged that increased ship traffic in Coos Bay from the Project would negatively impact public recreation.[573] The DEIS discusses these potential impacts in Section 4.8.1.1, including specific consideration of potential impacts on recreations boaters, fishers, clammers, and crabbers from the Project both during dredging of the access channel for construction, and during facility operations.[574] In particular, the DEIS discusses potential water quality impacts from dredging activities, wake and propeller wash impacts from transiting LNG carriers, the total boat-use days in Coos Bay per year as well as particular species of interest to recreational anglers.[575] The DEIS also considers the impact on recreational users required to vacate areas near the transit route due to the moving security zone requirements around an LNG carrier, as specified in the USCG Waterway Suitability Report and Letter of Recommendation.[576] Moreover, the DEIS compares the impact from increased deep-draft LNG carrier traffic against the current transit of other deep-draft type ships.[577] In sum, the DEIS adequately considers potential impacts from LNG vessel traffic on recreational uses of Coos Bay.

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[566] DEIS at 4-417. PCGP plans to provide 14 days' prior notice to landowners and fence owners prior to disturbing any fencing.
[567] DEIS at 4-417.
[568] DEIS at 4-417.
[569] DEIS at 4-417. PCGP proposes to negotiate with landowners and provide compensation for relocation of livestock during construction, as applicable.
[570] Cynthia Garrett Comments at p. 4.
[571] DEIS at 4-302.
[572] DEIS at 4-213.
[573] Comments of Doro Reeves, Accession No. 20190513-5000, at 1 (May 11, 2019); Comment of Michael S. and Joy L. McDowell, Accession No. 20190423-0050 (Apr. 23, 2019), Comment of William D. Merris Jr., Accession No. 20190411-0014 (Apr. 11, 2019); WELC Comments at p. 81.
[574] *See* DEIS 4-539 to 4-541.
[575] *See* DEIS at 4-540.
[576] *See* DEIS at 4-541.
[577] *See* DEIS at 4-540 to 4-541.

B. **Aesthetics**

Some commenters expressed concern that the Project would impact visual and aesthetic resources in the Project area and that the visual resource analysis is insufficient.[578] The visual resource analysis made use of viewpoints determined from BLM and Forest Service visual resource guidelines.[579] NEPA allows federal agencies to rely on the determinations of "other agencies whose area of expertise is superior to their own."[580] Therefore, the Commission's reliance on the visual resource guidelines of the BLM and Forest Service is both reasonable and warranted.

Commenters suggested that the corridor right-of-way for the Pipeline should be considered as a permanent adverse visual impact due to maintenance strategies proposed for the right-of-way easement.[581] The visual impacts of the pipeline are discussed in Section 4.8.2.2 of the DEIS, where long-term impacts from the right-of-way are already noted and addressed.[582]

The DEIS addresses visual resources, visual simulations for the Project, and measures to minimize Project-related impacts on sensitive viewsheds.[583] Analyses are performed in the DEIS for various distinct viewpoints.[584] Additionally, the DEIS includes discussion of visual impacts from LNG carrier traffic, including considerations both for ship speed and size.[585] The DEIS specifically notes although the LNG carriers are large vessels, they are relatively close in size to the cargo ships transporting wood chips that currently transit Coos Bay, which average around 600 feet in length, and thus ships of this scale are already a regular occurrence in the waterway, and the presence of LNG carriers would not be a new type of visual feature on the waterway.[586] Although the Project would result in some short- and long-term visual impacts, the DEIS discusses mitigation measures to reduce visual impacts along the Pipeline route from PCGP's Aesthetics Management Plan, as well as JCEP measures to minimize visual effects from the LNG storage tanks.[587] Therefore, the DEIS adequately contemplates visual impacts and mitigation measures.

C. **Public Land / Recreation Area**

Some commenters express concern about reduction in groundwater levels from the Project and the subsequent impact on local lakes and wetlands.[588] Commenters' concerns are misplaced. The DEIS notes that the Project could affect groundwater sources, and it discusses the source and quantity of water likely necessary for the Project;[589] however, the DEIS also discusses mitigation

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[578] Sandy Egleston Comments at p. 1.
[579] *Id.* DEIS at p. 4-557.
[580] *Save the Bay, Inc. v. United States Corps of Engineers*, 610 F.2d 322, 325-326 (5th Cir. 1980).
[581] *See* Grand Ronde Comments at Attachment 2.
[582] DEIS at pp. 4-576 to 4-577.
[583] DEIS at pp. 4-557 to 4-587.
[584] *See, e.g.*, DEIS at 4-561 to 4-563.
[585] DEIS at pp. 4-564 to 4-565.
[586] DEIS at 4-565.
[587] DEIS at 4-566, 4-578 to 4-579. *See also* Appendix A to the Plan of Development, Docket No. CP17-494, submitted on January 23, 2018.
[588] WELC Comments at p. 78; Comment of Francis Eatherington, Accession No. 20190705-5077, at p. 7 (July 4, 2019).
[589] *See* DEIS at pp. 4-75, 4-78 to 4-79, 4-81.

measures from the Project's Groundwater Supply Monitoring and Mitigation Plan.[590] Regarding surface water sources, such as lakes, streams, and wetlands, the DEIS discusses the impact of water withdrawal on waterbody volume.[591] The DEIS also discusses discharge and dewatering plans to allow any removed water to be returned to waterbodies.[592] Moreover, the DEIS makes repeated reference to the contents of the Project Application's Resource Report 2.[593] A detailed groundwater study discussed in Resource Report 2 indicates that dewatering associated with the Project is likely to have little, if any, effect on the nearest dunal lakes or other lakes further north.[594] That groundwater study is also discussed in the current DEIS.[595] The groundwater study concludes that impacts to nearby groundwater wells would be temporary and localized, and there would be no long-term impacts to nearby groundwater wells or existing pumping rates. Moreover, the groundwater study includes a framework for hydrologic monitoring to establish baseline conditions and monitor changes. This includes baseline, construction, and operational monitoring to assess the timing, magnitude, and duration of construction related efforts on surface water levels, groundwater levels, and water quality.Therefore the DEIS adequately considers and addresses potential impacts to groundwater and surface water levels from the Project.

Some commenters expressed concern that construction and operation of the LNG Terminal would affect recreational use of the Oregon Dunes National Recreation Area.[596] The DEIS considers impacts to this area specifically, including noise, visual impacts, site access, traffic congestion, and recreational interference,[597] Additionally, the DEIS includes analysis of proximity and screening on impacts to visual resources.[598] Taking a wide array of considerations into account, the DEIS finds that impacts to visual resources are expected to be insignificant or temporary.[599]

Additionally, off-highway vehicles ("OHVs") that are allowed on the beach and dune trails are significant contributors to the existing ambient noise levels on the North Spit. The DEIS compares the noise limit for OHVs in the Oregon Dunes, which is 93 dBA at 20 inches from the exhaust outlet, and notes that for riders and other people in close proximity to the OHVs, OHV sound levels would exceed the predicted LNG Terminal construction and operational noise levels.[600] Distance, topography, coastal wind, and vegetation would help to minimize the noise from the construction (and operation) of the LNG Terminal in the portions of the Oregon Dunes where OHVs are not allowed (between the Trans Pacific Parkway and Horsfall Beach Access Road, which is the area immediately north of the LNG Terminal site).

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[590] *See* DEIS at p. 4-81.
[591] *See* DEIS at p. 4-109.
[592] *See* DEIS at p. 4-109.
[593] *See, e.g.* DEIS at pp. 2-45, 4-77, 4-79, 4-81, 4-106.
[594] JCEP Resource Report 2, Sections 2.1.1 and 2.1.2; GSI "Technical Memorandum", 2015; GSI "Technical Memorandum", 2017.
[595] *See, e.g.*, DEIS at p. 4-75.
[596]League of Women Voters Comments; Comment of Rogue Climate, Accession No. 20190705-5182 (July 5, 2019).
[597] *See* DEIS at pp. 4-535, 4-538, 4-548 to 4-549, 4-557.
[598] DEIS at p. 4-558.
[599] *See* DEIS at pp. 5-6 and 5-7.
[600] DEIS at 4-538.

Some commenters expressed concern about increased OHV use from the Project.[601] However, the DEIS provides an adequate discussion of these impacts. The DEIS discusses the potential for increased OHV use due to the right-of-way, as well as measures to mitigate the impacts of any such increased use.[602] The DEIS also references PCGP's Recreation Management Plan,[603] which describes measures to be employed on both public and private lands to control OHV use.[604] The analysis in the DEIS includes discussion of erosion control, vegetative screening, and various other measures to limit the impact of the Project on various recreation areas.[605]

X. *Socioeconomics*

A. Environmental Justice

Some commenters suggested that the DEIS does not contain an adequate discussion of environmental justice.[606] Although it does not apply to the Commission,[607] Executive Order 12898 directs certain federal agencies to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."[608] An accompanying Presidential Memorandum directs those agencies to promote environmental justice through the NEPA process.[609]

Section 4.9.1.9 of the DEIS addresses environmental justice impacts of the Terminal, and section 4.9.2.9 addresses environmental justice impacts of the Pipeline. The Commission followed the three-step process laid out in EPA guidance and "reviewed the Project to determine if resulting impacts would be disproportionately high and adverse for minority and low-income populations and appreciably exceed impacts on the general population or other appropriate comparison group."[610]

First, the Commission identified the composition of the potentially affected population.[611] The Commission used data at the census tract level to confirm the identification of environmental

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[601] Comment of Jackson County Oregon, Accession No. 20190702-5135 (July 2, 2019); Comment of Oregon Women's Land Trust, Accession No. 20190702-5054 (July 1, 2019).
[602] DEIS at pp. 4-544 to 4-555.
[603] DEIS at p. 4-549.
[604] DEIS at pp. 4-549 to 4-550.
[605] *See, e.g.*, DEIS at pp. 4-544 to 4-545.
[606] NRDC Comments at pp. 45-53.
[607] *See, e.g., Florida Southeast Connection, LLC*, 154 FERC ¶ 61,080, at P 260 (2016).
[608] Exec. Order No. 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Fed. Reg. 7629 (Feb. 11, 1994) ("Exec. Order 12898"). The Executive Order lists the agencies that must comply in section 1-102 and the Commission is not one of the agencies listed nor is the order binding on the Commission, although Section 6-604 further explains that independent agencies are requested to comply with the executive order.
[609] Presidential Memorandum: Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 11, 1994), *available at* https://www.epa.gov/sites/production/files/2015-02/documents/clinton_memo_12898.pdf.
[610] DEIS at p. 4-599; *see also* Exec. Order 12898 at § 1-101.
[611] DEIS at p. 4-600.

justice communities.[612] This identification of environmental justice communities follows EPA and CEQ guidance that recommends using data from the Bureau of the Census.[613]

Second, FERC examined the impacts of the Project to determine whether there will be any high and adverse impacts to these populations.[614] The DEIS concludes that the only high and adverse impacts from the terminal site are to the visual character of Coos Bay and the demand for housing from the influx of workers.[615] The DEIS concludes that there are no high and adverse impacts from the pipeline.[616]

Next, the Commission analyzed whether the Project will have disproportionate impacts on environmental justice populations.[617] The DEIS concludes that "none of the potential low-income populations are located within 1 miles of the terminal site . . . and the potential for these populations to be disproportionately affected relative to other populations within 3 miles of the site is low."[618] The DEIS acknowledges that tribal populations have the potential to be disproportionately affected by the terminal site; however, these impacts will be addressed in the ongoing consultation with the tribes under section 106 of the National Historic Preservation Act.[619] The DEIS also concluded that there is a low likelihood that environmental justice communities will be disproportionately affected relative to other populations in the census tracts crossed by the pipelines.[620]

FERC sufficiently analyzed environmental justice concerns. Although the EPA and CEQ guidance is not binding, FERC followed this guidance in the DEIS. No further analysis is required.

B. **Jobs and Workforce**

As described above, in Section III.A, the Project will provide a sustained economic boost to local businesses of all types, including $95.7 million in direct local spending by employees during each year of construction and $14.2 million per year when operating, as summarized in ECONorthwest's March 2019 report, *Jordan Cove Project Worker Spending Impacts on Coos, Douglas, Jackson, and Klamath Counties*.[621] In addition, the Project will provide more than $500 million to local Community Enhancement Plan partners by directing eligible Enterprise Zone tax savings to local governments, benefitting Coos Bay, North Bend, Coos County, and Port residents. The DEIS evaluated data from the Oregon Employment Department, U.S. Bureau of Economic Analysis, and U.S. Census Bureau, as well as ECONorthwest 2017 studies submitted in the

[612] *Id.* at pp. 4-600 to 4-601.
[613] Counsel on Environmental Quality, Environmental Justice Guidance Under the National Environmental Policy Act, at p. 14 (Dec. 10, 1997), *available at* https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf.
[614] DEIS at pp. 4-603, 4-618.
[615] *Id.* at p. 4-603.
[616] *Id.* at pp. 4-618 to 4-619.
[617] *Id.* at pp. 4-603, 4-619.
[618] *Id.* at p. 4-603.
[619] *Id.*
[620] *Id.* at p. 4-619.
[621] Applicants plan to submit this updated report in a supplemental filing.

record.[622] This analysis sufficiently supports the conclusions in the DEIS related to the positive impacts from the Project on the local economy and employment.[623]

Despite these economic benefits, certain commenters expressed concern regarding impacts related to job creation in the Project area, including the potential for an increase in traffic or crime and the potential for a decrease in the availability of affordable housing.[624] Information provided on the record supports the analysis in the DEIS in Section 4.9 and FERC's conclusions therein. The proposed workforce housing at the South Dunes site is addressed throughout the DEIS, including Section 2.1.1.10, Section 4.8.1.1, and Section 4.9.1.2. As stated in the DEIS, parking would be provided at the Workforce Housing Site and shuttle buses would be provided to and from local communities to reduce traffic impacts after working hours. As stated in in Section 4.9.1.1 of the DEIS, attempts to estimate Project-related increases in crime would be speculative, but were they to occur, such increases would likely be commensurate with the relative increases in population.[625] Applicants' contractors will sign worker expectation agreements, and a no-tolerance policy will be in place for Project workers who fail to abide by local rules and regulations.

Potential Project-related impacts on the availability of affordable housing are addressed in Section 4.9.2.2 of the DEIS. To minimize impacts on rental rates and the potential displacement of other residents seeking rental accommodations, Applicants propose to construct a temporary workforce housing facility within the South Dunes portion of the LNG Terminal site that could accommodate facilities and 200 to 700 beds.

C. Farms, Fishing, and Recreation Business Impacts

Numerous commenters express concern regarding navigational conflicts within the channel and Coos Bay and potential impacts on local fishing or recreational business.[626] These concerns are adequately addressed in Sections 4.9.2.7 and 4.9.2.8 of the DEIS and JCEP's responses to the April 20, 2019 data request.[627]

D. Property Values

Certain commenters expressed concern that presence of the Pipeline will lessen the value of affected landowner properties.[628] FERC evaluated a number of studies that previously sought to determine the impacts of the presence of a pipeline on property values.[629] This information sufficiently supports the DEIS's discussion of pipeline-related effects on property values in Section 4.9.2.3. As stated in the DEIS, based on review of available studies and property valuation, the likelihood of the Pipeline resulting in a long-term decline in property values is low.[630]

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[622] DEIS at Section 4.9.2.4.
[623] DEIS at Section 4.9.2.4.
[624] *See, e.g.*, League of Women Voters Comments at 17-18, 81, 89; WELC Comments at pp. 49-51.
[625] DEIS at p. 4-590.
[626] *See, e.g.*, Center for Biological Diversity Comments at p. 54; League of Women Voters Comments at pp. 18, 89.
[627] Responses to April 20 Data Request of JCEP, Accession No. 20180510-5165 (May 10, 2019) ("April 20 Data Request Response").
[628] *See, e.g.*, Niskanen Center Comments at 22-24; WELC Comments at 109.
[629] DEIS at 4-607.
[630] DEIS at 4-608.

XI. *Transportation*

Commenters expressed concerns related to transportation including marine traffic concerns, construction-related traffic on local roadways, and concerns regarding air traffic and the nearby Oregon Regional Airport.[631] The DEIS discusses impacts from marine traffic and references the United States Coast Guard's Letter of Recommendation, which found the Coos Bay Channel suitable for the type and frequency of LNG marine traffic.[632] The Commission may rely on these conclusions by the Coast Guard in conducting its own independent assessment.[633] Additionally, the DEIS addresses potential Project-related impacts and mitigation for marine traffic, motor traffic, railroad traffic, and air traffic.[634]. Moreover, the DEIS includes a condition requiring JCEP to work with applicable local agencies (e.g., Oregon Department of Transportation, Coos County, and the City of North Bend) prior to construction to minimize traffic impacts on local roadways to the extent practicable.[635] Therefore, the DEIS adequately contemplates transportation impacts from the Project.

XII. *Cultural Resources*

Many commenters expressed concern regarding Project impacts on ancestral lands of Native American Tribes.[636] The Section 106 process is addressed in Section IV.B herein, and the DEIS contains an adequate discussion of cultural resources for the purpose of NEPA.[637] Because it is not possible for FERC to determine the effects of every Project activity over the course of the Project lifetime, FERC requires Applicants to develop and implement Historic Properties Management Plans ("HPMPs") for the Project.[638] The purpose of the HPMPs is to provide direction for the avoidance or mitigation of potential effects to historic properties throughout the life of the Project in coordination with the Oregon State Historic Preservation Office ("SHPO"), federal agencies, and appropriate Tribes.[639] The Applicants anticipate that the need for these HPMPs would be further stipulated in an anticipated forthcoming Project memorandum of agreement to be signed by FERC and relevant state and federal agencies.[640]

The HPMPs for the Project would reference an Unanticipated Discovery Plan ("UDP"), which provides the procedures the Applicants would follow if unanticipated discoveries of historic properties, archaeological objects, archaeological sites, or human remains, funerary objects, sacred items and items of cultural patrimony are made during the construction and operation of the Project.[641] Moreover, the DEIS includes a condition that final HPMPs and avoidance plans be

[631] *See, e.g.*, League of Women Voters Comments at 72-73.
[632] *See* DEIS at 1-13 to 1-14, 2-10, 4-622 to 4-623.
[633] *Sierra Club v. Clinton*, 746 F. Supp. 2d 1025, 1038 (D. Minn. 2010) (agency utilizing another agency's assessment of particular impacts as support for its independent NEPA assessment).
[634] DEIS at 4-622 to 4-631.
[635] DEIS at 5-19.
[636] *See, e.g.*, Regna Merritt Comments at p. 1; League of Women Voters Comments at pp. 90-91.
[637] *See* DEIS at 4-632 to 4-655.
[638] *See* DEIS at 4-652.
[639] *See* DEIS at 4-652 to 4-653.
[640] DEIS at 4-654.
[641] *See* DEIS at 4-652 to 4-653.

filed prior to the Project beginning construction.[642] As such, the DEIS adequately considers impacts to cultural resources.

XIII. *Air Quality and Noise*

A. Air Quality

Some commenters expressed concerns about air pollution from the LNG Terminal, noting that homes located near similar plans in Texas and Washington have reported lower air quality as a result of fumes.[643] Other commenters similarly asserted that the PCGP compressor station would increase exposure to hazardous air pollutants associated with health hazards to communities in the vicinity of Malin, Oregon.[644]

These concerns are misguided. With respect to the compressor station, PCGP obtained and will comply with the terms of all applicable air permits. The Commission is entitled to rely on Jordan Cove's future compliance with applicable permits.[645] Moreover, as noted in the DEIS, the total hazardous air pollutant emissions from the compressor station "are estimated to be just 1.3 [tons per year]."[646] This qualifies the compressor station as a minor source of hazardous air pollutants.[647]

Concerns about air pollution from the LNG Terminal are similarly misguided. JCEP will be required to obtain a Title V Operating Permit for the LNG Terminal and will comply with any conditions of this permit.[648] The Commission is entitled to rely on Jordan Cove's future compliance with other applicable permits.[649] Further, section 4.14.1.10 of the DEIS discusses the Project's cumulative air quality impacts. The other projects in the construction air emissions geographic and temporal scope of the LNG Terminal are the COE Coos Bay Navigation Channel Maintenance Dredging Project (for routine maintenance dredging in the Federal Navigational Channel) and the Southwest Oregon Regional Airport Extension. The cumulative impacts analysis conducted for the USACE's routine maintenance dredging, which analyzed the airport extension and the original LNG Terminal, found that no substantial cumulative effects would occur (as documented in the 2015 environmental assessment referred to the in DEIS[650]). Additionally, the DEIS extensively addresses air quality issues associated with both construction and operation, including specific analysis of emission sources and volumes and comparisons with potential emissions and applicable air quality standards.[651] Moreover, the Applicants would implement a host of BMPs and facility design techniques to minimize the air quality impacts during

[642] *See* DEIS at 5-19.
[643] *See, e.g.*, Comments of Karen Saxton, Accession No. 20190408-5117 at p. 1 (Apr. 8, 2019); Comments of Tanya Bond, Accession No. 20190521-0006 at p. 1 (May 20, 2019).
[644] League of Women Voters Comments at p. 14; *see also* Regna Merritt Comments at p. 1.
[645] *See supra* Section II.A.5.
[646] DEIS at 4-675.
[647] *Id.*
[648] DEIS at 4-804.
[649] *See supra* Section II.A.5.
[650] DEIS at 4-803.
[651] DEIS at 4-668 to 4-678.

construction and operation of the LNG Terminal and Pipeline.[652] Based on this analysis, the DEIS reasonably concluded that the Project would not significantly impact air quality.

B. **Noise Quality**

Commenters raise a number of noise related issues. One commenter asserts that the DEIS fails to discuss noise-related impacts on humans from the Project, limiting its analysis to estimates of predicted noise levels without any mention of what these noise levels might do to humans.[653] In the view of these commenters, the DEIS improperly focused on "the extent to which the Project complies with existing regulations and FERC guidelines."[654]

This concern misunderstands the DEIS's noise analysis, found in Section 4.12.2. As stated in the DEIS, FERC analyzed "potential noise impacts on human receptors" and adopted its noise-level criterion based on EPA guidance.[655] EPA is the federal agency charged with protecting human health; as such, FERC established its noise criteria based on the levels determined by EPA to protect the public. Compliance with existing noise regulations and FERC Guidelines is included in the DEIS to evaluate Project effects on human health based on estimated Project noise levels and the regulatory thresholds determined by EPA to protect the public from noise-related health effects.

Commenters also expressed concern that the DEIS improperly assumes that JCEP will implement noise mitigation measures.[656] These concerns are unfounded. Noise mitigation and FERC staff recommendations are included in Section 4.12.2 of the DEIS. The Applicants anticipate that FERC staff recommendations regarding noise mitigation would be conditions of any Certificate for the Project issued by the Commission. As a condition of the Certificate, the Applicants would be required to implement these mitigation measures. Conditions of the Certificate, presented as staff recommendations in Section 4.12.2 of the DEIS, would be in place to ensure compliance with the FERC's noise thresholds. These measures include monitoring noise during construction, filing weekly noise reports to FERC, ceasing activities to implement noise mitigation if thresholds are exceeded, and receiving written concurrence from FERC to resume the noise producing activity.

Finally, commenters asserted that the DEIS improperly characterized the Project's noise impacts by overly relying on cumulative descriptors, rather than on single event measures.[657] In the commenters' view, analysis of construction noise, which is highly intermittent and often impulsive (e.g., rock blasting), should be supplemented by single event measures, such as the Lmax or maximum level.[658] These concerns are, again, misguided. Measures to assess noise exposure are

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[652] *See* DEIS at 4-669 t 4-670, 4-673 to 4-674, 4-678.
[653] *See, e.g.*, Comments of Dr. Alice H. Suter, Accession No. 20190617-5140 at pp. 1-2 (June 17, 2019) ("Dr. Alice H. Suter Comments"); *see also* WELC Comments at pp. 60-61.
[654] *See, e.g.*, Dr. Alice H. Suter Comments at 1-2; WELC Comments at p. 60.
[655] Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Mar. 1974), *available at* https://nepis.epa.gov/Exe/tiff2png.cgi/2000L3LN.PNG?-r+75+-g+7+D%3A%5CZYFILES%5CINDEX%20DATA%5C70THRU75%5CTIFF%5C00000239%5C2000L3LN.TIF
[656] Dr. Alice H. Suter Comments at p. 4; *see also* WELC Comments at p. 60; Jackson County Comments at p. 8.
[657] Dr. Alice H. Suter Comments at p. 5; *see also* WELC Comments at p. 62.
[658] Dr. Alice H. Suter Comments at p. 5; *see also* WELC Comments at p. 62.

described in Section 4.12.2 of the DEIS. To evaluate impulsive sound sources, Lmax levels for pile driving are included in Table 4.12.2.3-2 of the DEIS. Further, no blasting is anticipated to be required for construction of the LNG Terminal because the site area consists of sand. The Blasting Plan (filed as Appendix C of the POD) for the Pipeline includes mitigation measures to minimize charge-related blast noise.

APPENDIX 2.D.

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF ENERGY PROJECTS
888 FIRST STREET, NE
WASHINGTON, DC 20426

In Reply Refer To:
OEP/DG2E/Gas Branch 3
Jordan Cove Energy Project, L.P.
Pacific Connector Gas Pipeline, L.P.
Docket Nos. CP17-494-000
CP17-495-000

VIA ELECTRONIC MAIL

July 29, 2019

Joe Zisa
U.S. Fish and Wildlife Service - Oregon Office
Joe_Zisa@fws.gov

RE: Jordan Cove Energy Project - Request to Initiate Formal Consultation

Dear Mr. Zisa:

In accordance with Section 7 of the Endangered Species Act (ESA), the environmental staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared a Biological Assessment (BA) for the Jordan Cove Energy Project (Project). This BA has been transmitted to you electronically and will be entered into the Commission's administrative record.

The BA will be available to the public for viewing and downloading and can be accessed using eLibrary. Click on the "eLibrary" link from the Commission's website (www.ferc.gov), then choose "General Search", and enter CP17-495 or CP17-494 into the Docket Number field. Be sure to select the appropriate date range. For assistance, please contact FERC Online Support at FERCOnlineSupport@ferc.gov or by phone, toll free at (866) 208-3676, or for TTY, contact (202) 502-8659.

As described in the BA, based on our review of potentially affected federally-listed threatened and endangered species (and proposed species) and associated critical habitats subject to your jurisdiction, we have concluded that constructing and operating the Project would result in determinations of *no effect; may affect, not likely to adversely affect;* and *may affect, likely to adversely affect* (see enclosed summary table). Because the Project is likely to adversely affect federally-listed threatened and endangered species, we respectfully request the initiation of formal consultation with your office for the Project.

If you have any questions regarding this request, please contact Mr. John Peconom, Environmental Project Manager, at (202) 502-6352; or by email at john.peconom@ferc.gov.

Sincerely,

Paul Friedman

for James Martin, PhD
Branch Chief
Gas Branch 3

Enclosure

Jordan Cove Energy Project Federally-Listed Threatened and Endangered Species			
Species	**Federal Status**	**Portion of the Project Area Where Species May Occur**	**Effect of Proposed Project on Species, Critical Habitat a/**
Mammals			
gray wolf *Canis lupus*	Endangered – Critical Habitat	Pacific Connector pipeline	NLAA, NE
Pacific marten (Coastal DPS b/) *Martes caurina*	Proposed Threatened	Jordan Cove terminal	NJ/LAA c/
Pacific fisher (West Coast DPS b/) *Pekania pennanti*	Proposed Threatened	Pacific Connector pipeline	NJ/LAA c/
Birds			
short-tailed albatross *Phoebastria albatraus*	Endangered	LNG carrier transit route in the waterway	NLAA
Western snowy plover *Charadrius alexandrinus nivosus*	Threatened – Critical Habitat	Jordan Cove terminal, navigation reliability improvements dredge area	NLAA, NLAA
marbled murrelet *Brachyrampus marmoratus*	Threatened – Critical Habitat	LNG carrier transit route in the waterway, Pacific Connector pipeline	LAA, LAA
northern spotted owl *Strix occidentalis caurina*	Threatened – Critical Habitat	Pacific Connector pipeline	LAA, LAA
Fishes			
Lost River sucker *Deltistes luxatus*	Endangered – Critical Habitat	Stream crossings of Pacific Connector pipeline	LAA, NLAA
shortnose sucker *Chasmistes brevirostris*	Endangered – Critical Habitat	Stream crossings of Pacific Connector pipeline	LAA, NLAA
Amphibians and Reptiles			
Oregon spotted frog *Rana pretiosa*	Threatened –Critical Habitat	Pacific Connector pipeline	NLAA, NLAA
Invertebrates			
vernal pool fairy shrimp *Branchinecta lynchi*	Threatened – Critical Habitat	Pacific Connector pipeline	LAA, NLAA
Plants			
Applegate's milk-vetch *Astragalus applegatei*	Endangered	Pacific Connector pipeline	LAA
Gentner's fritillary *Fritillaria gentneri*	Endangered	Pacific Connector pipeline	LAA
Western lily *Lillium occidentale*	Endangered	Jordan Cove terminal Pacific Connector pipeline	NLAA
large-flowered woolly meadowfoam *Limnanthes pumila* ssp. *grandiflora*	Endangered – Critical Habitat	Pacific Connector pipeline	NLAA, NLAA
Cook's lomatium *Lomatium cookii*	Endangered – Critical Habitat	Pacific Connector pipeline	NLAA, NE
Kincaid's lupine *Lupinus suphureus* var. *kincaidii*	Threatened – Critical Habitat	Pacific Connector pipeline	LAA, NE
rough popcornflower *Plagiobothrys hirtus*	Endangered	Pacific Connector pipeline	NLAA

a/ Effects Key: NLAA = Not likely to adversely affect, LAA = Likely to adversely affect, NE = No effect, NJ = not likely to jeopardize the continued existence for proposed species

b/ DPS=Distinct Population Segment

c/ This represents a provisional effect determination for this ESA proposed species. This provisional effect determination would apply if the species becomes listed prior to the completion of consultation on the Project.

Document Content(s)

Initiate Formal Consultation 2 - FWS.PDF.....1-3

Oregon State Agency Comments
Jordan Cove Energy and Pacific Connector Gas Pipeline Project
Draft Environmental Impact Statement
(Docket # CP17-494-000 and CP17-495-000)
December 23, 2019

Introduction

The State of Oregon is currently reviewing the final Environmental Impact Statement ("final EIS" or "FEIS") to ensure it provides a full and fair disclosure of the significant environmental impacts that may result from the siting and operation of the Jordan Cove LNG export terminal facility and the Pacific Connector Pipeline project (hereinafter collectively referred to as, the "Project") as well as the comparative impacts resulting from a reasonable range of alternatives to the proposed action. *See* 40 C.F.R. § 1502.1; *see also* 40 C.F.R. § 1502.1 ("An environmental impact statement is more than a disclosure document. It shall be used by federal officials in conjunction with other relevant material to plan actions and make decisions.").

The State provides these consolidated comments on the behalf of certain agencies that filed comments on the Draft Environmental Impact Statement ("DEIS"). Because the State's review is ongoing, either these agencies, or other agencies who commented on the DEIS but are not included in these consolidated comments on the FEIS, may have additional comments at a later date.

If a State agency has determined that the FEIS adequately addresses a specific DEIS comment made by that agency, the agency will note that in the comments that follow. Otherwise, the State's position is that its consolidated comments on the DEIS, dated July 3, 2019, were either not addressed or inadequately addressed in the FEIS. The State therefore reiterates its consolidated comments on the DEIS except as specifically noted below.

Oregon Department of Fish and Wildlife

Contact: Sarah Reif, Energy Coordinator
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The Oregon Department of Fish and Wildlife (ODFW) submits the following comments on the FERC Final Environmental Impact Statement (FEIS) for the Jordan Cove Energy Project (JCEP) and the Pacific Connector Gas Pipeline (PCGP).

ODFW is statutorily charged with the management of the State of Oregon's fish and wildlife resources (ORS 496.012, ORS 506.109, ORS 509.140, and ORS 509.580 through 509.910). ODFW has an interest in federal actions affecting these resources.

Upon review of the FEIS and the various elements of the associated Comprehensive Mitigation Plan (September 2019). ODFW finds the proposed federal action insufficient in the following ways:

- Inconsistency with ODFW Fish and Wildlife Habitat Mitigation Policy (ORS 496.012 and ORS 506.109; OAR 635-415-0000 to -0025):
    - Proposed impacts to nesting habitats for marbled murrelet and northern spotted owls cannot be mitigated. The plans are inconsistent with the Category 1 mitigation standards of the policy.
    - Documents provide insufficient detail with regard to proposed mitigation actions. Since the project's inception, ODFW has recommended FERC and the federal land management agencies crosswalk the federal land compensatory mitigation plans with the standards in the ODFW mitigation policy to ultimately ensure that fish and wildlife impacts are avoided, minimized, and mitigated. As of the date of this letter, this crosswalk has not been included in the FEIS, and therefore ODFW does not have the information it needs to ensure the project's impacts will be offset to State of Oregon standards.
    - Where information has been provided, ODFW finds the proposed compensatory mitigation for impacts to estuarine environments, wetlands and waterbodies, and uplands does not fully meet the state's standards for offsetting the proposed pipeline's impacts to fish, wildlife, and their habitats.
- Incomplete or missing Fish Passage Plans (ORS 509.580 through 509.910; OAR 635-412-0005 through -0040).
    - At this time, ODFW has received Fish Passage Plans for the portion of the project located in the Coastal Zone Management Area (CZMA), however ODFW has requested additional information from the Applicant in order to finalize those approvals.
    - ODFW has not received fish passge design plans for the rest of the proposed pipeline and its associated infrastructure.
- In-Water Blasting Permit applications (ORS 509.140) have not been submitted to ODFW despite their mention in the FEIS.
- The FERC selection of the Blue Ridge Variation as its Preferred Alternative is inconsistent with the Biological Assessment, which analyzes the Applicant's preferred route. Furthermore, FERC has not obtained Section 7 Consultation from the US Fish and Wildlife Service or National Oceanographic and Atmospheric Adminsitration's (NOAA) Endangered Species Act Section 7 Consultations for the Blue Ridge Variation.

ODFW stands by its original comments on the FERC Draft EIS, which provide greater detail supporting the points raised above. Please continue to refer to the *Oregon State Agency Comments on FERC's Draft Environmental Impact Statement for Docket Nos. CP-17-494-000 and CP17-495-000 dated July 3, 2019*.

ODFW also requests FERC give equal consideration to the comments and recommendations ODFW provided to the BLM on December 20, 2019 in *Oregon Department of Fish and Wildlife Protest of the Bureau of Land Management Proposed Resource Management Plan Amendments: Jordan Cove Natural Gas Liquefaction Terminal and Pacific Connector Gas Pipeline Plan (DOI-ORWA-M000-2017-0007-EIS).*

Please be advised that ODFW intends to submit supplemental comments on this FEIS in the coming weeks. Should you have any questions or require additional information, I am your primary contact for this project and my contact information is provided above.

Oregon Department of Energy

Siting Division

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The FEIS addresses Oregon Department of Energy comments regarding State jurisdictional components of the LNG terminal by asserting that none are proposed. This is factually inaccurate. The applicant still proposes to construct a thermal energy production facility with the capacity to generate more than 25 MW. As proposed, the applicant would still utilize 3 STG's capable of producing 30 MW each. While the updated RR 13 and now FEIS assert that the applicant will purchase power from "the grid" reducing their need for on-site power production, this does not change the jurisdictional nature of the facility which is defined by its **generating capacity** (ORS 469.300(27)). Barring final engineering which describes how the facility will be incapable of generating more than 25 MW, or a fully executed agreement between the applicant and the State establishing that this is the case, Jordan Cove will still require approval from Oregon's Energy Facility Siting Council and will be responsible for meeting Oregon siting standards found in Oregon Revised Statute and Administrative Rules. In addition to other standards, these include Oregon's CO2 emissions standards, the provision of a legally enforceable retirement bond for the project, and a comprehensive discussion of, and preparation for, emergency situations that could endanger humans and the environment from construction and operation activities.

Emergency Preparedness

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The Oregon Department of Energy anticipates submitting comments on safety and security issues in the FEIS in the near future. In the interim, the Oregon Department of Energy reiterates the safety and security comments it provided on the DEIS.

Parks and Recreation Department, Oregon Department of, State Historic Preservation Office (Oregon SHPO)

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Section 4.11 addresses Cultural Resources in the FEIS. FERC outlines the steps in the Section 106 implementing regulations (36CFR800) of the NHPA as: "1) consultation, 2) identification of historic properties, 3) assessment of effects; and 4) the resolution of adverse effects." Below, comments on the level of effort in terms of these steps are provided, in addition to communications in Appendix L.

Consultation with SHPO

Section 4.11.1 states: "Consultations for the current Project began with the issuance of the NOI on June 9, 2017". As our office previously commented for the Draft Environmental Impact Statement (DEIS) the NOI is a scoping document. The Title of the June 9, 2017 NOI includes: "Request for Comments on Environmental Issues, and Notice of Public Scoping Sessions". The document is not evidence of consultation under Section 106 of the National Historic Preservation Act (NHPA), and really should not be referenced as such in the Final Environmental Impact Statement (FEIS). As has been previously stated in our comments to the DEIS, the NOI stated: "The project-specific Area of Potential Effects (APE) will be defined in consultation with the SHPO as the Project develops." Consultation with the SHPO on the APE is addressed in 36CFR800.4, where it states: "In consultation with the SHPO/THPO, the agency official shall determine and document the area of potential effects as defined in §800.16." As of this writing, consultation on the APE has yet to occur. Our office responded to the NOI on June 27, 2017 stating that we looked forward to consulting with FERC on the APE.

If consultation began on June 9, 2017 with the issuance of the NOI as FERC states, it is confusing that correspondence between FERC and SHPO prior to that time, under different iterations of the project that are no longer applicable, are included as actual consultation. The five additional references to correspondence in Appendix L-1 prior to June 9, 2017, are all in reference to a 2011 Memorandum of Agreement (MOA) regarding a five-year review and termination. It is the responsibility of FERC to consult with SHPO, as well as other consulting parties on the current undertaking. Since the June 9, 2017 letter, we have received one other letter from FERC regarding the project. The remaining three listed in Appendix L-1 consist of letters from SHPO to FERC. Other letters discussed later are omitted.

As mentioned above, the June 21, 2017 letter to FERC from SHPO indicated that we looked forward to consulting on the APE, which has not yet happened. The October 18, 2017 letter from FERC to SHPO was an invitation to assist with development of the EIS, which is not consultation, nor is it the role of SHPO to produce such documents. The January 18, 2018 letter to FERC included our concurrence with eligibility determinations for a portion of the project received from the contract archaeologist. The

September 24, 2018 letter to FERC concurred with eligibility determinations for a portion of the project received from the contract archaeologist. Finally, the July 19, 2019 letter to FERC was written at the request of one of FERC's consulting parties, to inform FERC of a property that had been determined eligible through the state process, and further determined eligible by SHPO. Since June 2017, our office has submitted four letters to FERC (three in Table L-1), against one invitation to produce the EIS.

It is additionally unclear why Applicant Communications are included in Appendix L and Table L-2. For example, the December 14-22, 2017 email chain (listed as three entries in Table L-2) from Jordan Cove to SHPO is described as "Future investigations at the former mill site at the South Dunes portion of the terminal". Review of the email chain responses documents two concerns from the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI) over potential impacts to cultural resources. However, in that email chain, Jordan Cove states the initial email was part of their voluntary 30-day notifications of ground disturbance, that "is not part of the FERC 'undertaking' and Section 106 concurrence is not required".

Shortly after the December 14-22 2017 email, the Advisory Council on Historic Preservation (ACHP) sent a letter on January 25, 2018 to FERC due to "expressions of concern from the CTCLUSI regarding geo-technical testing planned for portions of the project site for the Jordan Cove LNG project." In the letter, the ACHP requested "that FERC clarify for the Indian tribes, the proponent, and other consulting parties [which would include SHPO] the relationship of this testing to the undertaking subject to Section 106. We also ask that FERC show how it has considered the potential for effects to historic properties from the proposed testing." The January 25, 2018 letter from ACHP to FERC is not included in the FEIS Appendix L.

On August 8, 2018, Oregon SHPO sent a letter to FERC as a follow-up to the ACHP January 25, 2018 letter reiterating the request from ACHP. The August 8, 2018 letter from SHPO to FERC is not included in Appendix L or Table L-1. As of this writing, Oregon SHPO has not received a response to the August 8, 2018 letter.

For the remaining steps, while our office has concurred with some eligibility determinations, it was due to submissions by the contractor. Assessment of some effects and resolution of effects has also been through the contractor and the project proponent. Our office is unaware of any delegation of authority under 36CFR800 from FERC to the applicant. Other than the correspondences referenced above, consultation in terms of 36CFR800 from the lead federal agency has not addressed the APE, determinations of eligibility, findings of effect, or resolution of adverse effects.

Oregon Department of Land Conservation and Development

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- DLCD has determined that many concerns and recommendations were not addressed in the FEIS.
- Section 1.5.2.7 states "Applicants for certification of CZMA consistency are encouraged by the ODLCD to obtain state and local permits and other authorizations required by enforceable policies. The requirements of the CZMA are applicable to NPDES permits and must be included in the NPDES permit for the Jordan Cove industrial wastewater treatment facility." This statement is not accurate. The following is a comprehensive list of state permits or authorizations that are required for this project and applicable to the coastal zone:
    - ODEQ: Air Contaminant Discharge Permit (JC)
    - ODEQ: CWA Section 401 Water Quality Cert (JC and PCGP)
    - ODEQ: 1200-C Construction Stormwater (JC Terminal)
    - ODEQ: 1200-C Construction Stormwater (Kentuck Slough)
    - ODEQ: 1200-C Construction Stormwater (US HWY 101/TPP)
    - ODEQ: NPDES General Permit 1200C (PCGP)
    - ODEQ: 1200-C Construction Stormwater (APCO)
    - ODEQ: Individual WPCF- Hydrostatic Testing (PCGP) in CZ
    - ODEQ: NPDES- Wastewater Treatment Plant
    - ODFW Fish Passage Plans Kentuck/APCO
    - ODFW Fish Passage Plan Access Road Steam Crossing in CZ
    - ODFW Fish Passage Plans Pipeline Stream Xings in CZ
    - DSL Removal-Fill Authorization (All)
    - DSL Proprietary Authorizations: Easements (JC)
    - DSL Proprietary Authorizations: Sand and Gravel Licenses JC
    - DSL Proprietary Authorizations: Waterway Use JC
    - DSL Proprietary Authorizations: Mitigation JC
    - DSL Proprietary Authorizations: State-owned land Xing's PCGP
    - DSL Proprietary Authorizations: Special Use
    - OWRD: Limited License: Coos River
    - OWRD: Limited License: East Fork Coquille
    - OWRD: Limited License: Middle Fork Coquille

    - OPRD/SHPO: State Archeological Permits(Various) JC Terminal
    - OPRD/SHPO: State Archeological Permits (Various) PCGP in CZ
    - OPRD/SHPO: State Archeological Permits(Various) JC Terminal
    - OPRD/SHPO: State Archeological Permits (Various) PCGP in CZ
    - ODOE Energy Facility Siting Certificate
- Given that the federal consistency review could result in state-imposed conditions to modify the project, the FERC must know the outcome of this review before issuing a decision. However, most importantly, if the FERC does issue a license provisioned on obtaining a concurrence from Oregon, it is a matter of federal regulation that the applicant does not begin construction prior to a federal consistency decision. Based on these requirements of the CZMA, DLCD requested that the recommended condition at section 4.7.1.2 be changed to reflect Condition #30 (Section 5.2, pg 5-19) and language altered to be consistent throughout the EIS. The FERC did not clarify that pursuant to CZMA § 307 (c)(3)(A), the FERC license is not effective until Oregon concurs with the applicant's consistency certification and that any conditions included with the concurrence will become conditions of the FERC license.

Table of narrative comments made by DLCD relating to the DEIS

Issue	DEIS Comment	Addressed in the FEIS
Recommendation, rather than requirement for CZMA decision to be made prior to a potential FERC license to be effective. Oregon must concur with activity, any state conditions must also be included as conditions within the potential FERC license.	"Given that the federal consistency review could result in state-imposed conditions to modify the project, the FERC must know the outcome of this review before issuing a decision. However, most importantly, if the FERC does issue a license provisioned on obtaining a concurrence from Oregon, it is a matter of federal regulation that the applicant does not begin construction prior to a federal consistency decision. Based on these requirements of the CZMA, DLCD requests that the recommended condition at section 4.7.1.2 be changed to reflect Condition #30 (Section 5.2, pg 5-19) and language altered to be consistent throughout the EIS. The FERC should clarify that pursuant to CZMA § 307 (c)(3)(A), the FERC license is not effective until Oregon concurs with the applicant's consistency certification and that any conditions included with the concurrence will become conditions of the FERC license."	Not addressed in the FEIS – language outlines a recommendation that FERC avoid decision making until CZMA decision is made.
Necessary information and agreements made after the issuance of CZMA decision – leaving necessary state agencies without necessary information for review.	Sweeping mitigation and inventory recommendations that rely on the applicant providing the FERC information after issuance of the certificate order for the proposed project. That approach denies other permitting processes at the federal and state level, including federal consistency review, necessary information. Oregon created a networked coastal program, which means coastal partners and their state authorities are part of the federal consistency review currently under way. Relying on mitigation agreements after the certificate order, leaves partner state agencies without the information necessary to process permits and make decisions, including DLCD. A particular example is Recommendation #6 (pg. 5-13), which allows major alterations order issuance, aside from minor field adjustments. Such alterations would likely require permit modifications by various state agencies in the coastal zone and depending upon the significance of the change, implicate an additional federal consistency review per 15 CFR § 930.66. Similar challenges exist for Recommendation #33 for cultural resource inventories and	Not addressed in the FEIS

	associated plans and comments. Many of these 'post-order' conditions circumvent the state's opportunity to analyze impacts and provide the FERC comments on the extent of impacts and adequacy of mitigation for a broad array of issues in order to inform the final EIS.	

DLCD: Topics identified in Notice of Intent or in scoping period comments and remaining deficiencies in the DEIS with relationship to the CZMA federal consistency review process.

Issues	Source	Extent Analyzed in 2019 DEIS	Missing from 2019 DEIS	Relationship to CZMA Analysis	Addressed in the FEIS
Reliability and safety of LNG carrier traffic and natural gas pipeline	Commission Staff in NOI	Section 4.10.1.1 Marine Traffic Section 4.13.1.3 Safety and Reliability focuses on collisions with LNG carriers. Conclusion Section 5.1.10: Increased marine traffic would be less than historic ship traffic and so no significant impact to other marine traffic.	--Safety of other commercial and recreation vessels, aside from collisions with LNG carriers (*i.e*. increased wait times to enter Coos Bay in changing weather conditions because of LNG carrier security zone) --Time of year 70 construction vessels or 120 LNG carriers will be present. If all year, how will vessels safely navigate winter weather conditions or location of anchorage if within Territorial Sea if not able to enter bay. --Locations where marine traffic can wait safely in bay while LNG carrier passes. See Figure 1 based on a carrier 50 yards wide. --No discussion regarding what maximum size carrier the bay can accommodate safely.	Coastal effects evaluation for local coastal economies.	No
Impacts to aquatic resources from dredging access channel and slip and pipeline crossings	Commission Staff in NOI	Section 4.3 Water Resources and Wetlands	--Please see DEQ comments for detailed information for missing analysis regarding water quality.	Coastal effects evaluation for impacts to natural/cultural resources and related	No

		Section 4.6 T&E Species Appendix H: Lists temporary and permanent impacts Conclusion Section 5.1.3.1; 5.1.3.2; 5.1.3.3: No significant impacts	--Please see ODFW comments for detailed information on missing analysis regarding: --Fish, wildlife, and associated habitats; e.g. the deepwater draft slip; salinity intrusion from dredging; impacts to aquatic organisms; and other aquatic concerns. Lack of assessment of riparian and steep slope impacts of the pipeline project. --Mitigation for temporary impacts to aquatic resources is a concern. Applicant and DEIS have specified mitigation actions for permanent impacts, however, the DEIS does not identify the temporary impacts fully for both JCEP and PCGP or propose mitigation. (*i.e.* impacted wetlands on pipeline route may take 4+ years to recover ecological function from pipeline impacts). --Mitigation for temporally related habitat function impacts. --Without specified mitigation that is tailored to address fish and wildlife habitats/ecology, it is not possible to balance impacts with offsets and come to a conclusion regarding total	local coastal economies.	

			environmental impacts for the project.		
Potential impacts on the LNG terminal resulting from an earthquake or tsunami	-Commission Staff in NOI -State of Oregon scoping period comments; DOGAMI comments August 15, 2017; pg 8	Section 4.1 Geological Resources Section 4.13 Reliability and Safety	-- Please see DOGAMI comments for detailed information regarding missing analyses including the following topics: -- Geologic hazards have not been comprehensively identified, addressed in the DEIS, nor mitigation proposed for impacts. -- Dependencies on existing infrastructure, such as roads and levees, which may fail during disasters causing public and environmental safety concerns have not been included. --Tsunami hazards analyses, including tsunami hazards with the proposed channel and estuarine modifications from related Port project, specifically how currents, debris and ballistics may negatively impact the surrounding areas and safety of people, have not been included. --An explanation of how the applicant will design, engineer, construct and operate the facility to integrate disaster resilience design	Coastal effects evaluation for impacts to local coastal economies and natural/cultural resources.	No

			to ensure recovery of operations after major disasters. --An assessment of future climate conditions for the expected life span of the proposed facility and the potential impacts of those conditions on the proposed facility -- ASCE 7-16 (issued 2016) design standards include tsunami requirements, while the older versions do not. No discussion regarding new tsunami requirements or why most recent standards were not used.		
Impacts of pipeline construction on federally listed threatened and endangered species including northern spotted owl, marbled murrelet, and salmon	Commission Staff in NOI State of Oregon scoping period comments; ODFW comments August 15, 2017; pg 15-34	Section 4.6 lists impacts to federally listed species throughout. May affect and likely to adversely affect 12 species. Section 4.7 lists total late successional (old) forest acres on BLM land. 159.19 acres, BLM Coos Bay District, Section 2.1.7 Non-federal land	--Please see ODFW comments for detailed information regarding missing analyses. --The DEIS notes some mitigation (*i.e.* older stand management); however, without specific assessment of impacts in relation to mitigation it is difficult to balance effects and come to a conclusion regarding total environmental impacts for the project.	Coastal effects evaluation for impacts to natural/cultural resources and local coastal economies (salmon; recreational and commercial).	No

		mitigation still in development. Section 5.1.6 states no mitigation has been proposed by applicant to date.			
Impacts of pipeline construction to private landowners including the use of eminent domain	Commission Staff in NOI	Section 2.3.2 Statement of ability for Project to use the right of eminent domain	--Entire analysis of impacts of exercising eminent domain on landowners, livelihoods, land-associated businesses, and property values.	Coastal effects evaluation for impacts to coastal economies.	No
Cumulative effects from additional large-scale projects in Coos Bay; particularly related Channel Modification project.	State of Oregon scoping period comments; ODFW comments August 15, 2017; pg 15	Section 4.14: Statements acknowledge cumulative effects of the Port's Channel Modification throughout. Acknowledged project is likely to have the largest contribution to cumulative impacts on Coos Bay. (pg 4-794) Appendix N lists total acres whether upland or aquatic) from all regional projects.	--Please see ODFW comments for detailed information regarding missing analyses including: --Limited analysis of impacts and lack of quantification of mitigation to offset impacts including, but not limited to: cumulative cubic yards, cumulative duration of disturbance in the waterway, cumulative conversion of shallow to deep-water habitat, cumulative changes in water current, cumulative changes to natural and conservation estuary management units in Bay, cumulative mitigation for permanent aquatic habitat changes including oyster, clam, shrimp, crab and other aquatic ecosystem-dependent economies.	Coastal effects evaluation for impacts to natural/cultural resources and economics.	No

			--Unable to locate Table 4.14.2.3-1 as reference in Section 5 (pg 5-11). Projects with largest estuarine impacts warrant deeper, quantifiable cumulative analysis.		
Impacts to non-listed species and upland habitats and associated mitigation for impacts.	State of Oregon scoping period comments; ODFW comments August 15, 2017; pg 28	Section 2.1.7 Non-federal land mitigation still in development. Section 4.6 briefly describes state listed species.	-- Please see ODFW comments for detailed information regarding missing analyses including the following: -- No analysis for state species of concern, habitats of concern, state protected wildlife, associated mitigation for species habitats via state's habitat mitigation policy.	Coastal effects evaluation for impacts to natural/cultural resources	No

Table 2. Additional deficiencies of the DEIS identified by DLCD.

Topic	Sections/Pages	Missing from 2019 DEIS	Relationship to CZMA Analysis	Addressed in the FEIS
Impacts of spatial restrictions of channel use to recreational and commercial fisheries. Please see Figure 1.	Section 4.8.1.1 JC Terminal Recreation and Visual Resources: Acknowledges impacts to crabbing/clamming, boating, and fishing because of LNG carrier security zone (pg 4-540-541) Section 4.9.1.7 Recreation/Tourism and 4.9.1.8 Commercial Fishing: Acknowledges impacts from LNG carrier security zone (4-596-598).	Analysis regarding economic impacts from LNG carrier security zone requirements (*i.e*. missing preferred fishing times, tides, or other critical natural resource timing issues due to 2-3.5 hour delay (page 2-14) while LNG carrier is in navigation channel). The time estimation in Section 4.8 (pg 4-541) conflicts with information on pg 2-14 and also on pg 4-598 (20-30 minutes). Bar pilots guiding commercial ships report passing approx. 6 recreational boats (pg 4-541) and 2 commercial fisheries boats (pg 4-597) per trip. The width of carrier plus security zone (likely 500 yard radius	Coastal effects evaluation for impacts to local coastal economies from safety considerations and associated delays	No

	Sections 5.1.8.1 and 5.1.9 Conclusion: No significant impacts commercial or recreational fisheries vessels or economies.	around moving ship (pg 4-623)), is approximately ¾ of a mile (See Figure 1). No spatial analysis of security zone for LNG carrier including pinch points, safe waiting areas, vessel delays, and associated impacts to fisheries-dependent economies. The security requirements for LNG carriers are not similar to other deep-draft vessel use of the channel, warranting additional analysis.		
Impacts to regional resources and economy from global climate change due to additional atmospheric carbon inputs	Section 4.14: Cumulative Impacts Acknowledges broad impacts to nation from climate change. (pg 4-804-807).	Analysis does not include unique challenges to coastal region from: climate change and sea level rise, decreased income for natural resource-dependent economies, or increased wildfire. Analysis does not include alternative to require stricter emission mitigation, or mitigation to offset regional impacts.	Coastal effects evaluation for impacts to local coastal economies and natural resources.	No
Impacts to culturally-important resources in project area (Terminal and pipeline)	Section 4.11 Cultural Resources; Acknowledges the TCP nomination document as part of an impending ethnographic study (pg 4-637). Appendix L: Tables within list many sites in need of further survey and testing or that are currently unevaluated. L-13 mentions TCP and need to assess.	The DEIS does not include relevant information compiled in the traditional cultural property historic district nomination document or the impending ethnographic study from the applicant. Without the information, impacts cannot be assessed, or alternatives identified to avoid, minimize, or mitigate impacts to resources.	Coastal effects evaluation for impacts to cultural resources.	No

Oregon
Kate Brown., Governor

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February 5, 2020

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, D.C. 50426

RE: Oregon Department of Fish and Wildlife Supplemental Comments on FERC's Final Environmental Impact Statement for Docket Nos. 17-494-000 and CP 17-495-000 (Jordan Cove Energy Project LP and Pacific Connector Gas Pipeline LP)

Dear Ms. Bose:

The Oregon Department of Fish and Wildlife (ODFW) submits the following comments as a supplement to its December 23, 2019 letter[1] to the Federal Energy Regulatory Commission (FERC) on the Jordan Cove Energy Project (JCEP) and Pacific Connector Gas Pipeline Project (PCGP) Final Environmental Impact Statement (FEIS; Docket Nos. CP-17-494-000 and CP-17-495-000).

In addition to the comments ODFW provided in its December 23, 2019 letter and herein, ODFW recommends its July 3, 2019[2] comments to FERC regarding the Draft Environmental Impact Statement (DEIS) be considered still relevant and in need of remedy to sufficiently avoid, minimize, and mitigate impacts to the State of Oregon's fish and wildlife resources. Furthermore, ODFW recommends FERC give equal consideration to the comments and recommendations ODFW provided to the Bureau of Land Management on December 20, 2019[3] and to the U.S. Forest Service on January 6, 2020[4].

ODFW is statutorily charged with the management of the State of Oregon's fish and wildlife resources (ORS 496.012, ORS 506.109, ORS 509.140, and ORS 509.580 through 509.910). ODFW has an interest in federal actions affecting these resources. The manner in which the State of Oregon's fish and wildlife resources would be affected by the JCEP/PCGP projects is described in the aforementioned letters, and is discussed in further detail below.

These supplemental comments are focused on the following fish and wildlife resource issues:

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[1] *Oregon State Agency Comments on FERC's Jordan Cove Energy and Pacific Connector Gas Pipeline Project Final Environmental Impact Statement (Docket # CP17-494-000 and CP17-495-000) December 23, 2019.*
[2] *Oregon State Agency Comments on FERC's Draft Environmental Impact Statement for Docket Nos. CP-17-494-000 and CP17-495-000 dated July 3, 2019*
[3] *Oregon Department of Fish and Wildlife December 20, 2019 Protest of the Bureau of Land Management Proposed Resource Management Plan Amendments: Jordan Cove Natural Gas Liquefaction Terminal and Pacific Connector Gas Pipeline Plan (DOI-ORWA-M000-2017-0007-EIS).*
[4] *Oregon Department of Fish and Wildlife January 6, 2020 Protest of the United States Forest Service's Proposed Forest Plan Amendments (#28132) to the Umpqua, Rogue River-Siskiyou, and Fremont-Winema National Forests Jordan Cove Natural Gas Liquefaction Terminal and Pacific Connector Gas Pipeline Projects.*

- Incomplete fish passage plans (ORS 509.580-.910 and OAR 635 Division 412)
- Inconsistent information regarding the need for- and location of in-water blasting (ORS 509.140)
- Inadequate avoidance, minimization, and mitigation of impacts to fish and wildlife (ORS 496.012, OAR 635-415-0000 to -0025), particularly as it relates to:
    - JCEP Terminal Impacts
        - Estuarine:
            - Impacts associated with dredging and construction of the terminal
            - Eelgrass mitigation plan insufficiencies
        - Upland:
            - Impacts associated with the terminal facilities
            - Upland habitat mitigation plan insufficiencies
            - Kentuck Slough wetland mitigation plan insufficiencies
    - PCGP Pipeline Impacts
        - Upland habitat mitigation insufficiencies
        - Forest habitat loss and mitigation for marbled murrelet and northern spotted owl
        - Horizontal directional drilling risks
        - Wetland/waterway impacts and mitigation
        - Water quality and quantity impacts.

Each of the bulleted items are discussed more fully below.

Fish Passage

It is the policy in the State of Oregon to provide upstream and downstream passage for native migratory fish (see ORS 509.580 through 509.910 and corresponding Administrative Rules OAR 635-412-005 through 0040). Fish passage is required in all waters of Oregon in which native migratory fish are currently or were historically present. With some exceptions defined in ORS 509.585, a person owning or operating an artificial obstruction may not construct or maintain any artificial obstruction across any waters of this state that are inhabited, or historically inhabited, by native migratory fish without providing passage for these fish. Projects that construct, install, replace, extend, repair or maintain, and remove or abandon dams, dikes, levees, culverts, roads, water diversion structures, bridges, tide gates or other hydraulic facilities can be "triggers" to Oregon's fish passage rules and regulations.

ODFW has received fish passage plan submittals for project components within the Oregon Coastal Zone Management Area (CZMA) and has met with the Jordan Cove Energy Project, L.P. and Pacific Connector Gas Pipeline Project L.P. (hereafter, the applicant) on multiple occasions to address insufficiencies in their applications. ODFW has received sufficient information for the Kentuck and APCO Mitigation actions within the CZMA. These actions include the East Bay Drive Bridge, Golf Course Lane Culvert, Kentuck Tide Gate, Kentuck Creek Restoration and the APCO Bridge. The information we have received for these sites is adequate for our review and approval and ODFW is working on the final fish passage authorizations for these restoration actions.

However, the following CZMA fish passage plan items need to be updated and re-submitted to ODFW for final review and determinations on fish passage and compliance with the state's rules and regulations. These items include:

a. Updated Appendix 3 of the applicant's fish passage application (Horizontal Directional Drill Plans – CZMA) to understand current drilling strategies, potential impacts, and appropriate In-Water Work Windows, and
b. Updated Appendix 6 of the applicant's fish passage application (Stream Crossing Risk Assessment - CZMA) – Stream Restoration actions. This information is critical in the development of site specific stream crossing restoration plans.

These two appendices are necessary for ODFW's final review, evaluation and determination of fish passage authorizations for the project components within the CZMA authority and where the state has fish passage authority (ORS 509.585).

ODFW has not received fish passage plan information on project components situated outside of the CZMA authority. ODFW is unable to proceed forward with our review, evaluation, and fish passage authorization for these project components. These project components include:

a. the proposed new LNG Pipeline and the associated fish bearing waterway crossings subject to the state's fish passage authorities, as per ORS 509.585, and
b. the transportation road infrastructure to access, install, maintain and monitor the project where these actions will cross fish bearing waterways subject to the state's fish passage authorities, as per ORS 509.585, and
c. associated plans for fish salvage and release.

In-Water Blasting

The PCGP Blasting Plan (FEIS Appendix F.10 Part C) states that in-water blasting is not anticipated during construction of the pipeline project, but that blasting may occur near waterbodies or within dry stream beds. ODFW in-water blasting permits will be required for blasting activities that occur in or adjacent to the bed of a fish-bearing stream regardless of whether it is dry or not (ORS 509.140 and OAR 635 Division 425). At this time, the applicant has not coordinated with ODFW on in-water blasting permits and the applicant's planning documents do not suggest any intent to do so.

The purpose of the in-water blasting permit is to further the State of Oregon's Wildlife Policy (ORS 496.012 and 496.138) and the Food Fish Management Policy contained in ORS 506.109 by applying consistent standards for reviewing and issuing in-water blasting permits as required by ORS 509.140. These rules establish procedures that ODFW will use to review and make decisions on applications for in-water blasting activities, including any permit conditions necessary to prevent injury to fish, wildlife, and their habitat.

Per OAR 635-425-0010 (7), 'in-water blasting' means the use of explosives on, under or in waters of this state, or in any location adjacent to the waters of this state where blasting would have an impact on fish and wildlife or their habitat. The PCGP Blasting Plan discusses blasting adjacent to waters of this state, and therefore triggers the ODFW in-water blasting rules. Additionally, the applicant discusses blasting within dry stream beds. However, the plan is not clear which stream beds or when blasting would occur. Some dry stream beds are fish-bearing in the wet season and may also trigger state fish passage requirements (see the section above,

regarding fish passage, within this letter). Diversion of water around a blasting site to make a streambed dry still requires an in-water blasting permit. It will also require maintenance of fish passage consistent with ODFW fish passage criteria (see above), and a mitigation plan to address potential direct and indirect impacts to terrestrial and aquatic habitat consistent with the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635 Division 415). Manipulation of a stream to divert water around a work site will also require a removal-fill permit from Department of State Lands.

The Blasting Plan discusses using 25-foot setbacks of 2-pound charges in bedrock to avoid hydrostatic pressure exceeding 7.3 psi from reaching known wet areas containing listed salmonids. The Blasting Plan cites research and guidelines from Alaska Game and Fish in its justification for using this minimization strategy. ODFW acknowledges this minimization measure may be appropriate for some blasting activities in proximity to waters of this state. However, this may not be adequate in all cases. ODFW will require that additional site-specific information be provided to ensure consistency with state statute and rule. For example, ODFW will require documentation of fish presence or absence and specific geology for any waters crossed or adjacent to blasting areas.

In one particular case, the Blasting Plan specifically discusses the diverted open-cut stream crossing at the South Umpqua River. The document states (pg. 8) "*as the trench proceeds across the stream bed, the trench blasting will approach the diverted portion of the stream crossing. This will likely result in blasting right up to the bladder dam edge which is used to divert the stream flow. If instantaneous hydrostatic pressure differentials cannot be maintained at acceptable levels during construction in critical habitat locations, additional mitigation measures, such as modified blast design or bubble curtains may be employed. Bubble curtain mitigation involves the use of bubblers placed within the waterbody between the source and receptor to help attenuate pressure changes. Additionally, where blasting may need to occur within stream beds, mitigation measures to minimize impacts to aquatic species are provided in the Fish Salvage Plan included as Appendix L to the POD*". This example most certainly would trigger both ODFW's in-water blasting permit rules and fish passage rules, and DSL's removal-fill rules. The application will need to address impacts to any fish and wildlife of concern along this section of the South Umpqua River. It is also not clear whether there are other examples of proposed crossings similar to the one described for the South Umpqua River.

Avoidance, Minimization, and Mitigation of Impacts to Fish, Wildlife, and their Habitats

One of ODFW's consistent comments to FERC throughout this environmental analysis is that the JCEP/PCGP projects could have significant impacts to fish and wildlife and their habitats, and that the applicant's plans for avoidance, minimization, and mitigation were not meeting the standards set forth by the Oregon Fish and Wildlife Commission in the OAR 635 Division 415 Rules. This insufficiency has not been rectified in the FEIS.

ODFW acknowledges FERC's response to ODFW comments in the FEIS Appendix R Part 2, and appreciates FERC's response to ODFW's recommended technical corrections throughout. However, whenever ODFW DEIS comments would identify mitigation insufficiencies in meeting state regulatory standards, FERC repeated the following response "*It is not the role or scope of the federal EIS to assess the Project's compliance with State regulations. We assume*

that the State would determine if the Project is in compliance with the State requirements during their review of the Applicant's State permit applications. As disclosed in Section 5 of the EIS, any authorization from the Commission would be conditional on the Applicant acquiring all applicable federal and federally designated permits."

Notwithstanding FERC's response, the Oregon Fish and Wildlife Commission directs ODFW to recommend avoidance, minimization, and/or mitigation for any impacts to fish and wildlife and their habitats in accordance with the Wildlife Policy (ORS 496.012) and to the standards set forth in the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635-415). Given that mitigation plans for this project do not fully meet state standards (as outlined in multiple sections below), ODFW is obligated to continue to raise these issues for FERC's attention as well as the attention of other federal and state regulatory agencies, and for the citizens of Oregon for whom ODFW manages fish and wildlife in the public trust.

JCEP Terminal Aquatic Impacts and Mitigation

General Comments

The FERC FEIS (November 2019) does not include sufficient detail about the proposed mitigation measures designed to offset the environmental impacts of the JCEP terminal project. The proposed Compensatory Wetland Mitigation Plan (CWMP) for impacts to estuarine environments, wetlands and waterbodies does not include sufficient information required to fully meet the state's standards for offsetting the impacts to fish, wildlife, and their habitats.

The FERC FEIS concludes that "*constructing and operating the project would result in temporary, long-term, and permanent impacts on the environment. Many of these impacts would not be significant or would be reduced to less than significant levels with the implementation of proposed and/or recommended impact avoidance, minimization, and mitigation measures. However, some of these impacts would be adverse and significant*" (FERC FEIS; Executive Summary, ES-6). The conclusion reached by FERC is premature, because specific mitigation measures have not been presented in sufficient detail in the FEIS to convey the level of confidence required to support the FERC finding of no significant impact.

More specifically, the FERC FEIS states that "*the applicants' Compensatory Wetland Mitigation Plan would satisfy the COE's regulatory requirements to mitigate unavoidable impacts on wetlands and waters of the U.S."* This statement is also premature at this time, because several essential components and details of the CWMP have not yet been finalized and are not presented in the FEIS. Consequently, it is not possible to fully evaluate the adequacy of the proposed CWMP and its capacity to satisfy federal or state regulatory requirements, particularly when the specific mitigation measures and habitat accounting details have not yet been developed, identified, or presented in the FEIS.

Several acres of intertidal and shallow subtidal habitats will be lost or converted to deeper water habitats in association with the proposed dredging, construction, and maintenance of the Navigation Channel, access channel, LNG Terminal and berth, and related LNG infrastructure. It is not clear that the proposed CWMP provides sufficient in-kind mitigation measures required to offset losses of the high-value (ODFW Fish and Wildlife Habitat Mitigation Policy / Category 2 and 3) estuarine habitats, or that the proposed mitigation measures can be implemented or

maintained in a manner that does not create new impacts to existing intertidal and subtidal habitats at the proposed mitigation sites.

The FERC FEIS states that "*we recommend that the Project-specific impact avoidance, minimization, and mitigation measures that we have developed (included in this EIS as recommendations) be attached as conditions to any Authorization and Certificate of Public Convenience and Necessity issued by the Commission for the Project* (FERC FEIS; Executive Summary, ES-7). While many of the measures identified in the EIS are essential in offsetting impacts, many are not sufficiently detailed or supported by adequate contingency planning at this time to support the FERC conclusion of no significant impact. The details supporting this concern are provided more fully below.

Impacts to the Coos Bay Estuary

Construction and operation of the proposed JCEP project will result in a complex combination of temporary, long-term, and permanent impacts to the estuarine environment of Coos Bay. The FEIS identifies that some of the impacts would be "*adverse and significant*" (FERC FEIS; Executive Summary, ES-6). The unique landform of North Spit and the Coos estuary tidal basin provide a semi-protected aquatic and coastal environment that is inhabited by diverse communities of fish and wildlife. Coos Bay is the largest estuary located entirely in Oregon and currently supports populations of fish and shellfish that contribute to economically and culturally significant commercial and recreational fisheries. In addition, the aquatic and upland habitats encompassed by the JCEP Terminal and associated facilities have been subjected to a long legacy of a number of landscape and waterway alterations including: dredging, rip- rap installation, leveling, and removal of native coastal pine forest, filling of wetlands, and other development related impacts. These habitats historically would have been primarily characterized as ODFW Category 2 or 3 habitats, (providing essential, important, and/or limited habitat function for fish and wildlife) under the ODFW Fish and Wildlife Habitat Mitigation Policy. Although negatively impacted historically, much of the tidal, subtidal, and upland habitats at the proposed Project site have received only minimal disturbance over the past two decades, and substantial recovery of ecological function has occurred.

The subtidal, tidal, intertidal, and shoreline features of the Coos Bay estuary tidal basin provide critical habitat for numerous culturally and economically important game and non-game species including, but not limited to: Dungeness crab (*Metacarcinus magister*), red rock crab *(Cancer productus*), cockles (*Clinocardium nuttallii*), gaper clams (*Tresus capax)*, butter clams (*Saxidomus giganteus)*, littleneck clams (*Protothaca staminea*), rockfish (*Sebastes spp.*), lingcod (*Ophiodon elongates*), greenling (*Hexagrammos decagrammus*), California halibut (*Paralichthys californicus*), English sole (*Parophrys vetulus*), Pacific sand dabs (*Citharichthys sordidus*), ghost shrimp (*Neotrypaea californiensis*), mud shrimp (*Upogebia pugettensis*), starry flounder *(Platichthys stellatus)*, smelts (Osmeridae family), (Engraulidae family), sardines (Clupeidae family), fall run Chinook salmon *(Oncorhynchus tshawytscha)*, green sturgeon *(Acipenser medirostris)*, white sturgeon *(A. transmontanus)*, (OC) ESA threatened coho salmon *(O. kisutch)*, and possibly Pacific lamprey (*Entosphenus tridentata*). The Coos Bay estuary is designated as Essential Fish Habitat (EFH) for all groundfish and salmon species included in the Pacific Fisheries Management Council's Pacific Coast Groundfish Fishery Management Plan (FMP) and the Salmon FMP, respectively (PFMC 2019, PFMC 2014). Under the EFH provision of the MSA, estuaries such as Coos Bay are further considered as Habitat Areas of Particular Concern

(HAPC) in recognition of their inherently high habitat value for breeding, rearing, foraging and shelter for fish and widlife. There is some potential that Pacific smelt (eulachon) (*Thaleichthys pacificus)* may also occur in the JCLNG area of Coos Bay. Additionally, the tideflats and subtidal regions of the lower Coos estuary are also sites for the commercial harvest of bay clams (gaper clams, butter clams, cockles) and mudflats in the JCLNG area support a commercial fishery for ghost shrimp (*Neotrypaea californiensis*).

Scattered populations of the native Olympia oyster (*Ostrea lurida*) have recently become re-established within the marine and polyhaline regions of the Coos Bay estuary where they typically occur as individuals or small clusters attached to rip-rap, rock, shell, or other hard substrata. The recovering populations of *O. lurida* are considered as a Strategy Species by the Oregon Nearshore Conservation Strategy. These at-risk populations of Olympia oysters are particularly sensitive to smothering and burial by silt and other suspended materials, and it is likely that they will be exposed to heavy loads of suspended sediment and excessive siltation during dredging activities associated with excavation of the new JCEP terminal.

The proposed JCEP terminal will create a new deep-water backwater basin for the LNG vessels that will likely result in several localized but significant biological effects (e.g., conversion of terrestrial habitat to aquatic habitat, conversion of intertidal habitat to subtidal habitat, change to estuarine tidal water flow patterns, alteration of salinity regime, elevated turbidity associated with initial dredging and subsequent maintenance dredging, loss of eelgrass and infaunal invertebrate communities from the intertidal and shallow subtidal zones, etc.). New numerical hydrodynamic models constructed for the Coos Bay estuary tidal basin provide technical forecasts regarding the predicted physical changes that are expected to occur throughout the estuarine tidal basin (see the modeling work by D. Sutherland at the University of Michigan, funded by the National Estuarine Research Reserve System). Comparable effort should be expended by JCEP to develop empirical data and model forecasts regarding the biological changes and ecological impacts that are expected to occur in association with the JCEP construction and operation activities. Without the generation of new empirical data and advanced modeling simulations, it is not currently possible to accurately identify the suite of direct and indirect impacts that are likely to occur, nor the spatial scale over which the impacts are likely to be significant or substantial.

Dredging Impacts to Estuarine Habitats and Communities

The FEIS describes the location and extent of dredging and removal of unconsolidated sediment from the intertidal and subtidal zones of the Coos Bay estuary, but only superficially considers the potential effects of dredging on aquatic habitat and species that are expected to occur in response to construction of the different components of the JCEP Terminal (Section 4.5.2.2). Direct impacts to estuarine habitats associated with construction of the vessel slip, access channel, temporary material barge berth, the material offloading facility, and rock pile apron (Table 4.5.2.2-2) are expected to be long-lasting and substantial. In particular, the estuarine portion of the JCEP LNG facilities would include direct impacts to about 37 acres of estuarine habitat, including 2 acres of eelgrass habitat, 13 acres of intertidal un-vegetated habitat, 4 acres of shallow subtidal habitat, and 18 acres of deep subtidal habitat. The JCEP also includes dredging and excavation of four submerged areas of the sub-tidal zone in Coos Bay (total 40 acres) along the Federal Navigational Channel and vessel access route to improve navigation reliability for the LNG carriers.

Unconsolidated soft-sediment habitat is widespread in the Coos Bay estuary tidal basin where it occurs extensively throughout the intertidal zone and sub-tidal zone along the bottoms, sides, and margins of primary and secondary tidal channels (Cortright *et al*., 1987; Rumrill, 2003). Soft-sediment habitats provide a series of diverse, productive, and dynamic ecological functions in the estuary, including provision of habitat and forage areas for invertebrates, fish, birds, and marine mammals, as well as serving as an important source of detritus. Soft-sediments also play an important role in the microbial and biogeochemical transformations of organic materials and nutrient cycling, and they typically serve as a sink or reservoir for the deposition of water-borne particles. Diverse communities of motile, epifaunal, and infaunal invertebrates inhabit the soft-sediments, and the communities of crabs, shrimp, amphipods, polychaete worms, copepods, hydroids, anemones, clams, and other invertebrates are specifically adapted to survive, feed, grow, and reproduce themselves in the unconsolidated sediments (Simenstad 1983; Emmett *et al*., 2000). Microbial activity and deposition of organic matter associated with fine-grained sediments together support a complex food web that includes multiple resident (infaunal, epifaunal, motile) and transitory (seasonal, migratory) species.

Mixed communities of shellfish, such as Dungeness crab, red rock crab, bay shrimp, gaper clams, butter clams, littleneck clams, softshell clams, cockles, and many other species are year-round residents of the intertidal and sub-tidal areas of the Coos estuary. Some of these shellfish are motile (*i.e.*, crabs and shrimp) and periodically move to different locations or migrate through the intertidal and sub-tidal zones, while others are stationary (*i.e.*, bivalves) and remain largely in place over the duration of their adult lives. The mixed communities of living bivalves and the beds of their non-living shells (*e.g.*, shell rubble or shell hash) are particularly important, because they function to stabilize unconsolidated sediments and provide heterogeneous habitat for numerous species of adult and juvenile fishes, crabs, shrimp, amphipods, worms, and other estuarine organisms. Moreover, filter-feeding by dense populations of living clams can sometimes play an important role in the removal of phytoplankton and smaller particulate materials, thereby decreasing turbidity and increasing light penetration through the estuarine water column. Consequently, maintenance of suitable soft-sediment habitat is essential for survival of the moderately long-lived (life-span 10-15 years or longer) gaper, butter, and cockle clams, particularly in the sub-tidal zone. When soft-sediment habitat is chronically disturbed and altered by dredging of the subtidal zone, there may be a permanent loss and impact to benthic invertebrate populations and a decline in the biodiversity of benthic communities. Loss of some or all of these sub-tidal populations of bay clams has implications for both the ecological functioning of sub-tidal habitats and the ability of the bay clams to serve as broodstock to support the recreational and commercial shellfish fisheries in Coos Bay (D'Andrea 2012).

Dredging and removal of the soft-sediments will likely have substantial and immediate local impacts on the sub-tidal populations of benthic invertebrates and shellfish, such as gaper clams, butter clams, and cockles. This may include the physical removal of the clams and their surrounding sediments, as well as a disruption of the mixed ecological communities of shellfish, mobile and infaunal invertebrates, and fish that make use of the sub-tidal habitats. The FEIS states that dredging would directly remove benthic organisms (e.g., worms, clams, benthic shrimp, starfish, and vegetation) from the bay bottom within the access channel and navigation channel modifications. Mobile organisms such as crabs, many shrimp, and fish could move away

from the region during the process, although some will be entrained during dredging so that direct mortally or injury could occur (FEIS Section 4.5.2).

The JCEP FEIS acknowledges that dredging, removal, and disturbance of the soft-sediment habitats will directly remove benthic organisms from the bay bottom, and that it is likely that recovery would occur in about one year for benthic resources particularly in the area of navigation channel modifications. This estimate of the rapid rate of community recovery is problematic, however, because the technical references cited by the JCEP FEIS (Section 4.5.2) are drawn from earlier investigations of dredging impacts that generally studied a group of small-bodied, rapidly-growing invertebrates (including amphipods, polychaete worms, small bivalves, etc. that have life-spans on the scale of months to a few years) as the focal species to provide metrics for the estimates of species and habitat recovery. These small opportunistic species are not representative of the large-bodied, long-lived bay clams that typically exhibit episodic recruitment and have life-spans on the scale of 10-20 years in the Oregon estuaries. Moreover, large-scale dredging modifications that include subsequent maintenance dredging every 5-10 years may not provide the opportunity for bay clams and other shellfish to recruit successfully and fully re-colonize after the repeated disturbance events. It is also likely that benthic food resources may also be impaired or lost for other estuarine species (*i.e.*, forage fish, salmonids, crab) as a result of dredging actions. Consequently, dredging activities that significantly disturb and/or remove the mixed communities of long-lived bay clams from soft-sediment habitat in the sub-tidal zones of Coos Bay are expected to have longer-term impacts that extend well beyond a time period of many years.

Despite notification by ODFW during the DEIS review process, the JCEP FEIS still incorrectly illustrates the major known oyster and shrimp habitat and clamming and crabbing areas in the bay relative to the Project activities (Figure 4.5-2). In particular, mixed communities of bay clams (*i.e.*, gaper clams, butter clams, cockles, and other species) are known to occur throughout the intertidal zone in the area immediately west and north-west of the airport runway (ODFW 2009; area AP). These areas are illustrated only as "Shrimp Habitat" and "Oyster Habitat" in FEIS Figure 4.5-2. It is not clear why the known clam beds located nearest the JCEP project area were omitted from Figure 4.5-2 when the map incorporates spatial information about the other clam beds throughout the intertidal zone of the Coos estuary tidal basin further distances away from the JCEP project area. The known clam beds within ODFW area AP (Airport Runway) are located within 50 m of the Temporary Dredge Line for the Federal Navigation Channel and within about 500 m of the proposed JCEP Access Channel, as illustrated in Figure 4.5-3 of the JCEP FEIS. In addition, it is also unclear what species of oyster is intended to be represented by the broad polygon that extends throughout the intertidal zone as "Oyster Habitat" in Figure 4.5-2. Commercial mariculture of Pacific oysters (*Crassostrea gigas*) does not occur anywhere in the intertidal zone near the airport runway, and patchy clusters of Olympia oysters (*Ostrea lurida*) only occur on the rocky rip-rap that extends around the periphery of the airport runway. The spatial distribution for major clam beds and shrimp beds should be corrected and updated with relevant information generated by ODFW for Coos Bay (2009).

As proposed, the JCEP also includes extensive dredging and excavation of four submerged areas of the sub-tidal zone in Coos Bay along the Federal Navigational Channel and vessel access route to improve navigation reliability for the LNG carriers. These actions include dredging of 27 acres of deep subtidal habitat at bend areas along the Federal Navigation Channel, and the

dredge lines for this additional activity would include disturbance and modification of another 13 acres of mostly deep subtidal habitat. The JCEP FEIS points out that these additional dredging activities and follow-up maintenance dredging would disturb the 40 acres of subtidal habitat and result in a short-term reduction in the ecological function of these areas by disturbance of the benthic and epibenthic organisms.

Ecological Importance and Impacts to Eelgrass

Beds of native eelgrass (*Zostera marina*) occur at several locations throughout the Coos estuary tidal basin where they provide numerous beneficial ecological functions, including heterogeneous habitat for a number of fish and wildlife species, nursery habitat for invertebrates and fish, forage areas for shorebirds and waterfowl, primary production and a source of organic-rich detritus, stabilization of unconsolidated sediments, trapping of suspended sediments, and contribute to improvements to estuarine water quality (Thom et al. 2003; Kentula and DeWitt 2003). In particular, the emergent canopy, blades and rhizomes of eelgrass beds provide complex and heterogeneous multi-dimensional habitat within the unconsolidated soft-sediments in the intertidal and shallow subtidal zones. In many cases, the abundance and species composition of macroinvertebrate, shellfish, and fish communities differ within eelgrass beds in comparison with un-vegetated areas where eelgrass is absent. Eelgrass beds are known to provide habitat for numerous species of invertebrates, including polychaete worms, cockles, gaper clams, butter clams, littleneck clams, Dungeness crab, grass shrimp and epibenthic invertebrates such as harpacticoid copepods, isopods, and gammarid amphipods. In addition, eelgrass beds also provide habitat for a diverse community of fishes, including juvenile salmonids, sculpin, English sole, shiner perch, lingcod, rockfish, pipefish, and herring. Native eelgrass is designated as Essential Fish Habitat (EFH) for all groundfish and salmon species managed under the PFMC Groundfish Fishery Management Plan and the PFMC Salmon Fishery Management Plan. Eelgrass beds are further designated as Habitat Areas of Particular Concern for groundfish and salmon due to their particular importance to ecosystem function and intrinsic habitat value for rearing, foraging and shelter.

Long-term efforts to remove root wads, large woody debris, and other natural structures embedded in the un-vegetated soft sediment of Coos Bay in order to facilitate commercial shipping and recreational boating have greatly exacerbated the lack of structural complexity along the shoreline and further increase the ecological importance of existing eelgrass beds. The heterogeneous canopies of eelgrass beds provide both primary complexity and an ecological edge-effect that presents an important biophysical transition zone for fish and invertebrates that forage in adjacent un-vegetated habitats.

The JCEP project includes dredging and construction of a new access channel to connect the terminal to the Federal Navigation Channel at about RM 7.3 (FEIS Section 2.1.1.7; Figure 2.1-7). The access channel will be about 700 feet in length, and about 2,200 feet wide at confluence with the Navigation Channel and about 780 feet wide at the Terminal. The access channel would be approximately 45 feet deep and would cover about 22 acres below the highest measured tide elevation of 10.3 feet (NAVD88). The proposed JCEP dredging activities will permanently destroy about 2 acres of established native eelgrass located in the intertidal and shallow subtidal zones of the project area. Dredging in the intertidal and shallow subtidal zones within the JCEP area is expected to have significant deleterious effects on native eelgrass habitats and the species found therein.

In addition to the direct removal of eelgrass at the JCEP dredging sites, it is likely that dredging operations carried out to implement the JCEP may also result in indirect impacts to adjacent eelgrass beds located in the vicinity of the JCEP area. For example, nearby eelgrass beds will likely experience periods of increased turbidity, sedimentation, and attenuated light levels resulting from dredging during construction and during subsequent periods of maintenance dredging. In this regard, the indirect effects of the JCEP to adjacent eelgrass beds have not been adequately addressed by the FEIS or Comprehensive Wetland Mitigation Plan.

Native eelgrass is recognized by ODFW as a Category 2 Habitat. The ODFW goal is no net-loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or quality (OAR 635-415-0025). To achieve the mitigation goal, ODFW recommends avoidance of the impacts through alternatives to the proposed development action, or effective mitigation of the impacts (if unavoidable) through reliable in-kind, in-proximity habitat mitigation to achieve no net loss of either pre-development habitat quantity or quality.

The proposed eelgrass mitigation plan within the CWMP does not give adequate consideration to the difference in habitat quality that is anticipated between the eelgrass impact area and the eelgrass mitigation site. The plan proposes to excavate about 9 acres of existing algae/mud-sand algae habitat located in the intertidal zone near the North Bend Airport to an elevation of -2.00 ft NAVD, and to convert the algae/mud-sand habitat into about 6 acres of eelgrass. The proposed conversion of algae/mud-sand habitat to eelgrass habitat is problematic, because algae-mud-sand is also recognized as Category-2 value habitat under ODFW Fish and Wildlife Mitigation Policy. Eelgrass habitat and algae/mud-sand are both considered as Category-2 habitat, but they provide different habitat functions and values for aquatic organisms. Accordingly, diminishing the quantity and quality of algae/mud-sand habitat in order to offset the loss of eelgrass habitat is not ‘in kind’ and does not create a ‘net benefit’, and therefore does not meet the ODFW Fish and Wildlife Mitigation Policy goals for Category 2 habitat.

In order to offset the loss of 2 acres of eelgrass the JCEP includes a proposed eelgrass mitigation plan that relies on the “best case scenario” for full success by creating 6 ac of eelgrass (3:1 ratio) within a 9 acre site in the intertidal zone near the impact area.

ODFW has noted several potential problematic issues associated with the proposed JCEP eelgrass mitigation plan that have not been fully considered and addressed by the applicant. In particular, ODFW previously raised the concern that the excavated JCEP mitigation basin may refill with sediment, and that the rate of sedimentation may not be conducive to survival, growth, and propagation of the planted eelgrass plants. For example, Mills and Fonseca (2003) conducted a series of field experiments to determine the susceptibility of eelgrass to burial by estuarine sediments. Results from the study demonstrate that eelgrass plants experience an increased likelihood of mortality and decreased productivity under burial conditions, and that the threshold level of burial tolerance for *Z. marina* is extremely low. Burial of eelgrass to depths as low as 25% of the aboveground plant height (4 cm) substantially increase mortality of eelgrass, causing death of >75% of the plants. Moreover, the probability of eelgrass mortality reached 100% for burial depths of 50% (8 cm) to 75% (12 cm) of plant height, depending on the types of sediment (e.g., sand, silt, combined) in which the plants were buried. These empirical observations indicate that eelgrass can only tolerate rapid sedimentation events that cover less than half of its

photosynthetic surfaces, and that small levels of rapid sedimentation are detrimental to survival of *Z. marina*.

Earlier research (Thom et al. 2018) has shown that eelgrass beds are typically limited by the availability of proper substrata, light, heat stress, and desiccation. Survival of the transplanted eelgrass within the excavated mitigation site will be dependent upon several ecological factors, including characteristics of the excavated sediment, sedimentation rate, erosion, light availability, nutrient availability, grazing upon seeds, seedlings, and blades, and a suite of inherent physical factors (*i.e.*, current velocities, wind fetch, slope, depth, seawater temperature, air temperature, humidity, desiccation, etc.). The proposed mitigation actions for eelgrass should be designed to retain the full array of ecosystem services provided by eelgrass beds in the JCEP area, and to achieve no-net loss of eelgrass over the entire lifespan of the JCEP operation in Coos Bay. In this regard, the planned mitigation activities should follow established in-kind, in-proximity standards established by the state of Oregon, and require long-term monitoring and remedial replanting of eelgrass as needed to compensate for losses that may occur over the entire lifespan of the Project.

The JCEP proposes to remove existing eelgrass in the Project area, and to offset the loss of eelgrass habitat by excavation of an eelgrass mitigation area coupled with replanting of eelgrass taken from a nearby donor bed. The JCEP proposes to monitor the effectiveness of the replanting effort for a period of only five years. It is important to note that failure of eelgrass replanting efforts is common in the Pacific northwest region (Thom et al., 2008), and that five years is an insufficiently short time period to adequately evaluate long-term mitigation success.

The CWMP does not adequately demonstrate that all efforts were made to identify optimal eelgrass transplant sites. The CWMP does not describe the alternative sites that were considered, characterize the location, species composition, and abundance of the eelgrass and other submerged aquatic vegetation at the alternative sites, and provide a more detailed rationale for rejection of the alternative sites and acceptance of the proposed site. The applicant has shared technical memoranda with ODFW describing some of the alternative sites considered in Coos Bay. However ODFW is aware of other potential sites that were not considered by the applicant. Furthermore, ODFW has not seen a revised version of the CWMP that incorporates the analysis shared in the technical memo.

Earlier attempts to mitigate for the damage or loss of eelgrass beds have met with limited success in Pacific Northwest estuaries. For example, Thom et al. (2008) conducted a review of 14 eelgrass mitigation and transplant projects, and they concluded that it is sometimes possible to restore eelgrass under favorable site conditions and when the reason for the initial loss of eelgrass is understood and corrected. The authors also noted, however, that eelgrass restoration science is hampered by knowledge gaps which reduce restoration success. The underlying mechanisms for recent eelgrass loss in the Pacific Northwest region are not obvious, which suggests that the scientific understanding of eelgrass biology and ecosystem conditions is currently inadequate to fully support environmental management actions (Thom et al. 2008).

Local complexities in hydrologic flow regimes are known to affect potential for success in eelgrass restoration efforts. These local complexities include considerations of the following:

- Habitat conditions created through excavation or filling are often ephemeral and subject to

subsequent deposition/erosion that results in movement of conditions outside of the range of preferred variability for eelgrass.

- Flow regimes including severity of wave action and current speed contribute to the potential success of a site for eelgrass establishment and growth. Sites that are created through excavation or fill are an artificial modification of conditions that have formed through the geomorphological features that drive flow regimes. Factors such as water depth reflect deposition/erosion rates from water transported sediments. Excavation or filling to a specific elevation is attempting to alter the natural elevation conditions in relation to hydrologic conditions for many sites that might serve as potential mitigation. Consequently, the potential for success is limited for projects that modify water depth/elevation of the substrates for creating conditions appropriate for eelgrass mitigation unless the site chosen has substrate elevation that has been artificially created from previous disturbance or the conditions are dominated by factors other than hydrology.
- Use of eelgrass sites immediately adjacent to or within the mitigation area for obtaining plants/shoots results in impacts to these locations, potentially weakening the vigor of eelgrass at these locations which is counter to goals.
- Excavation of locations adjacent to existing eelgrass beds can result in hydrologic changes such as erosion of surrounding substrates resulting in impacts to currently productive stands.
- The monitoring plan should be amended to include more robust methods such as diver or low tide visual count surveys with established known planting densities at time-0 and subsequent measurable surveys with quantifiable methods.
- Due to the potential for minimal success the eelgrass mitigation ratio is likely insufficient to offset impacts at the JCEP project impact location.

For all of the reasons listed in the discussion above, ODFW recommends the eelgrass mitigation strategies be re-evaluated to favor avoidance.

Dredging of the Navigation Channel and Impacts to Adjacent Estuarine Habitats

The FEIS also includes a description of excavation activities for four submerged areas (NRI Areas 1-4; removing about 700,000 cubic yards of material) that are located adjacent to the existing federally-authorized Coos Bay Navigation Channel. In particular, the JCEP will include dredging of four submerged areas that directly abut the current boundary of the Navigation Channel between RM 2 to RM 7 (FEIS Figure 2.1-1). These dredging activities will modify and alter the physical morphology of the Navigation Channel by widening four turns to allow for more efficient transit of LNG carriers.

It is likely that dredging of the four submerged areas (NRI Areas 1-4) will have indirect impacts to side slopes and soft sediment habitats located adjacent and in close proximity to the dredged areas. For example, the JCEP will include significant dredging and removal of unconsolidated sediment from NRI Area 2 (RM 4.5), NRI Area 3 (RM 6), and NRI Area 4 (RM 7), coupled with erosion of sediment from the adjacent subtidal and intertidal areas. The FEIS states that while the banks of the dredged areas are intended to be stable, some insignificant side slope equilibration may occur over about a 6-year period (see FEIS section 4.5.2). Loss of sediment from these immediately adjacent areas, however, will likely be substantial (*i.e.*, loss of 1-2 ft (30-60 cm) in depth over the first 3 years). Loss of the upper 30-60 cm of sediment from the side slopes located adjacent to the NRI dredged areas during the equilibration process is certainly not insignificant, and may result in further impacts and loss of eelgrass, infaunal invertebrates, and degradation of

the habitat for shellfish and fish. Loss of the upper 30-60 cm of sediment from the side slope of NRI Area 4 is particularly alarming, because this side slope is located in the immediate vicinity of the important eelgrass donor bed and eelgrass reference bed identified as essential components of the proposed JCEP eelgrass mitigation activities.

Potential loss or disturbance of the eelgrass donor bed and eelgrass reference area in the vicinity of NRI Area 4 puts the proposed JCEP eelgrass mitigation plan in jeopardy. The FEIS is deficient, because it does not adequately address the potential for loss of sediment adjacent to NRI Areas 2-4, and because it does not give adequate consideration to loss or disturbance of the important eelgrass donor bed and reference bed located adjacent to NRI Area 4.

Impacts of Maintenance Dredging

It is likely that marked changes will occur to the species composition, abundance, and productivity of benthic invertebrate communities that inhabit soft-sediments in the dredged areas of the Coos Bay tidal channel, and little recovery is expected over time due to the continual need for maintenance dredging. The JCEP proposes to conduct maintenance dredging about every 3 years, including removal of about 115,000 cy of material per dredging interval for the first 10 years of operation. Subsequent maintenance dredging will be carried out about every 5 years with removal of up to 160,000 cy of materials during each dredging event. For the marine waterway modification projects within the channel, maintenance dredging would also be conducted about every 3 years with about 27,900 cy of materials removed during each dredging event. It is likely that maintenance dredging operations of this magnitude will result in a continually disturbed condition for the soft-sediment habitat, preventing recruitment, growth, and survival of long-lived bay clams and other shellfish, and curtailing recovery of fish and invertebrate communities in the affected areas.

JCEP Terminal Freshwater/Estuarine Wetland Impacts and the Kentuck Slough Habitat Mitigation Plan

The JCEP terminal at Ingram Yard and South Dunes workforce housing/staging area will impact a number of habitats that provide critical function for fish and wildlife (see Jordan Cove CMP Attachment 3 Terminal Upland Mitigation Plan, Table 3). There is a total of 27.34 acres of permanent impact to estuarine and freshwater wetland associated with the terminal (7.32 acres freshwater).

The Kentuck Project is part of the JCEP/PCGP Compensatory Wetland Mitigation Plan (CWMP), and is the applicant's proposed mitigation offset for estuarine and freshwater wetland impacts of the JCEP/PCGP projects. ODFW has reviewed the Kentuck Project both in terms of its consistency with the ODFW Fish and Wildlife Habitat Mitigation Policy and its consistency with Fish Passage Rules, and provided substantive input to the applicant since concept inception. ODFW finds that the Kentuck Slough Mitigation Plan is missing some final key pieces of information in order to be consistent with state habitat mitigation standards.

ODFW reviewed the CWMP that the applicant included in its Comprehensive Mitigation Plan (CMP; submitted to the FERC Docket Numbers C17-494-000 and C17-495-000 in September 2019). ODFW also compared the impacts of the terminal to the offsets at Kentuck using Tables 1 and 2, and Appendix A-1, and sheet C-151 from the CMP, Resource Report 3 documents, and a David Evans and Associates JCEP project memo from 2013. The purpose of this comparison

was to ensure that the Kentuck Project would provide mitigation sufficient to meet the state standards outlined in OAR 635-415.

ODFW has determined the Kentuck Project will serve as in-proximity habitat mitigation at the HUC 4 scale for the wetland impacts of the JCEP terminal. The Kentuck Mitigation site has geomorphology, elevational, and hydrological ability to produce in-kind habitat features as defined under OAR 635-415. The historical actions at the site have altered its functional value from a Category-2 habitat of primarily algae-mud-sand and saltmarsh habitats to a minimally-functional freshwater wetland that is considered Category-5, which demonstrates sufficient restoration potential. The estuarine habitats altered/degraded by the JCEP as categorized under OAR 635-415 are able to be functionally reproduced through the design features of the Kentuck Project. There is sufficient land area to reproduce the habitat features impacted to offset affected Category-2-4 estuarine habitats.

However, the remaining issue is that ODFW has requested, but has not yet received, a long-term management plan for the Kentuck mitigation site, including:

- Long-term protection and stewardship strategies to ensure the mitigation site will be durable for the life of the project's impacts
- Long-term water management strategies for the Kentuck Creek water control structure.

Without this information, ODFW does not consider the Compensatory Wetland Mitigation Plan complete, in accordance with the ODFW Fish and Wildlife Habitat Mitigation Policy.

The applicant has verbally committed to redesigning the Kentuck mitigation elevation plan to develop additional acreage that will be below elevation +5.5 NAVDD88 *(*the elevation threshold for saltmarsh development) on the site. This will offset loss of Category-2 Algae/Mud/Sand habitats that will be dredged and regraded at the eelgrass mitigation site south of the North Bend Airport runway. The exact acreage (6.81 acres + slope area) of grading/dredging at the eelgrass location has of yet not been finalized. ODFW will need design plans and associated written information the final eelgrass site dredging/grading plan and the mitigation designs for the Kentuck site in order to determine if the loss of the Category-2 Algae/Mud/Sand will be offset. The expectation is the information would be in a revised Compensatory Wetland Mitigation Plan, but would be essential for ODFW to determine sufficiency and likely essential in the Oregon Department of State Land removal-fill permit as well.

The Kentuck site is slated for disposal of 300,000 cubic-yards of dredge spoils from development of the JCEP access channel. The applicant has not updated plans to describe where fill proposed to be disposed of at Kentuck will be relocated in order to allow the Kentuck grading plan to produce the additional acres below elevation +5.5ft. There would also be a need to update the grading and erosion control plans for both the eelgrass mitigation site and Kentuck Mitigation site, which may have additional or different impacts to fish and wildlife. These types of significant alterations to project plans are not addressed in the FEIS.

With regard to fish passage requirements at Kentuck, ODFW has received sufficient information for the Kentuck fish passage applications. These actions include the East Bay Drive Bridge, Golf Course Lane Culvert, Kentuck Tide Gate, and Kentuck Creek Restoration. The information we

have received for these sites is adequate for our review and approval and ODFW is working on the final fish passage authorizations for these restoration actions.

JCEP Terminal Upland Impacts and Mitigation

The construction of the JCEP slip, terminal, LNG storage tanks, workforce housing area, and staging areas are expected to degrade or remove 345.8 acres of wildlife habitat on the North Spit, Coos Bay (Jordan Cove LNG Comprehensive Mitigation Plan – Terminal Upland Mitigation Plan, Table 2). ODFW concurs with the habitat categorization provided in Table 2 of the CMP Terminal Upland Mitigation Plan, and finds it consistent with the ODFW Fish and Wildlife Habitat Mitigation Policy, except for the habitat categorization of coastal dune forest.

A total of 125.8 acres of Category 2 coastal dune forest will be impacted by construction of the JCEP Terminal and South Dunes workforce housing. In 2017, ODFW conveyed to JCEP that coastal dune forest is considered Category 2 habitat given its function and value for the coastal marten *(Martes caurina).* Coastal marten are an Oregon State Sensitive Species (OAR 635-100-0040), because they have low survival rates in fragmented forests, they occupy a significantly small area relative to their historic range, and because significant information gaps exist for the species. Coastal marten select for and show higher survival rates within multi-aged, multi-storied coastal dune forests with a higher percentage of older trees (Slauson et al. 2019). The portion of coastal dune forest west of Highway 101 and in the JCEP project area near Tenmile Creek is unique relative to other coastal dune forest in Oregon because of the presence of shore pine (*Pinus contorta*), approximates the multi-aged description above, and it is an area with known marten detections (ODFW District Wildlife Biologist, Stuart Love, Pers. Comm.). These coastal dune forests and the mixed understory vegetative dynamics are considered as essential and limited Category 2 habitat for the coastal marten in Oregon. Therefore, ODFW recommends no net loss plus a net benefit of habitat quantity or quality through reliable in-kind, in-proximity mitigation. Despite the Category 2 recommendation from ODFW, the applicant did not update its plans. Table 2, Table 4, and Table 5 of the Terminal Upland Mitigation Plan incorrectly identify coastal dune forest as Category 3. JCEP's proposed mitigation for these impacts is insufficient to meet the standards in ODFW's Fish and Wildlife Habitat Mitigation Policy (OAR 635-415).

Additionally, 1.6 acres of riparian forest and 7.6 acres of un-vegetated sand (Category 3 habitat; see Tables 4 and 5) will be impacted by the project. Riparian habitats are relevant for amphibians, neo-tropical migrant birds, and raptors. Un-vegetated sands are used by many species of shorebirds, small mammals, mesocarnivores, and raptors. The mitigation goal for unavoidable impacts to Category 3 habitats is reliable in-kind and in-proximity mitigation to achieve no net loss in habitat quantity or quality.

The remaining habitats that will be impacted at the JCEP terminal site are Cateogory4; shrub (9.3 acres), herbaceous shrub (63.5 acres), herbaceous (126.5 acres), and unvegetated sand that has been somewhat degraded from past impacts (4 acres). These Category-4 habitats are considered "important" for fish and wildlife species. The mitigation policy for unavoidable impacts to Category 4 habitat is no net loss.

From 2010 through 2016, ODFW staff worked with the JCEP consultant, David Evans and Associates to categorize JCEP terminal habitats according to their function and importance for fish and wildlife under OAR 635-415. This information was captured initially in the David

Evans and Associates *ODFW Habitat Categorization, Jordan Cove Energy Project Memo,* September 9th 2013; and is reiterated in the CMP Main Body and CMP Attachments (Supplemental info Attachment A Figures). ODFW has determined that implementation of the JCEP terminal project will eliminate/degrade upland habitats and their function for production of fish/wildlife, and that mitigation is necessary to offset losses.

During this same period, ODFW coordinated with David Evans and Associates in an effort to identify appropriate mitigation lands/actions in alignment with OAR 635-415. There were three primary mitigation projects discussed: 1) Panhandle Site, 2) North Bank Lane Parcel S, and 3) Access management within the Dunes National Recreation Area (Dunes NRA) or vicinity. The purpose of the third project was to manage all-terrain vehicle (ATV) activity to reduce disturbance to coastal marten and other species that use coastal dune forest as habitat.

Ultimately, David Evans and Associates informed ODFW that after extensive investigations and landowner contacts, the options to replace terminal upland habitats with in-kind and in-proximity habitat were very limited.

The current mitigation proposal in the JCEP CMP Terminal Upland Mitigation Plan identifies three sites with associated actions:

1). Panhandle Site 59.3 acres: Acquisition/conservation and uplift actions including management of non-native invasive plants, primarily Scotch broom. Local ODFW staff coordinated extensively concerning the identification of the Panhandle site for mitigation and have been on the property on several occasions to assess the proposed habitat improvements. Invasive Scotch broom currently dominates the site and reduces habitat quality and function for native fish and wildlife. The site is considered in-proximity and the treatments are partially considered in-kind as noted in Figure 2 (CMP; Terminal Upland Habitat Mitigation Plan). ODFW is generally in agreement with the details specified in Figure 2. Conservation of this parcel and preventing future development and current access by ATV's would be considered beneficial for coastal dune forest function on the properties.

2). North Bank Parcel S site 156 acres: Acquisition/conservation; provides middle-age timber stands on lands that are several miles east of coastal dune forest habitats. Mitigation actions would include conservation of land, forest management to promote late seral habitats, removal of gorse and Scotch broom, and seeding with wildlife seeding mixtures.

As stated above, the JCEP project will impact 125.8 acres of coastal dune forest (Table 4; CMP Terminal Upland Habitat Mitigation Plan), which are classified by ODFW as Category 2 according to the Fish and Wildlife Habitat Mitigation Policy.

The North Bank Parcel S is 17.1 acres of Category 2 shrub/scrub wetland, 133.8 Category 2 managed coastal dune forest dominated by Douglas fir (*Pseudotsuga menzeisii*), and 5.2 acres of riparian forest. This parcel is east of- and outside of - the largely unmanaged, coastal dune forest dominated by shore pine that is currently occupied by coastal marten. The mitigation site has an even-aged, evenly-spaced, mid-seral forest condition whereas the impacted forest has greater diversity and maturity in forest structure.

North Bank Lane mitigation actions (wildlife forage planting, control of gorse, and stand management) have been determined by ODFW to have potential to provide uplift benefits for coastal marten, their sciurid prey base, and other wildlife using coastal dune forest. The seeding with wildlife forage will offset loss of the Ingram Yard site for small mammals, deer, and perhaps foraging raptors. If timber management of stands at the North Bank site create forest attributes more similar to late-seral stand features, this will trend the 92.7 acres of coastal forest toward Category 2 function.

While the North Bank site may trend toward providing coastal dune habitat useful to coastal martens and other species, the mitigation ratio of impact to offset does not meet the ODFW Fish and Wildlife Habitat Mitigation Policy goal of no net loss in quantity. The 92.7 acres of incremental improvement at North Bank is not equivalent to loss of function of 125.8 acres at the JCEP site.

ODFW recommends additional consultation to more adequately address coastal dune forest habitat loss not offset by the North Bank Parcel S. One potential for uplift discussed previously that would be considered sufficient would be restriction of ATV access on 50-70 acres of coastal dune forest from Hwy 101 west to the beach and from the JCEP project area to Tenmile Creek. This would reduce disturbance on these additional acres, and improve habitat function for coastal marten.

3). Lagoon Site 41.2 acres: Acquisition/conservation or easement of the old Weyerhaeuser Paperboard Plant wastewater treatment ponds. Associated uplift actions include a) burying of power lines that are a bird strike risk, and b) long-term assurance of management control of the property in order to manage for fish and wildlife.

The Lagoon Site properties (Figure 4; CMP Terminal Upland Habitat Mitigation Plan) are ponds that were utilized historically for processing of the Weyerhaeuser Paperboard facility that was located at the South Dunes site wastewater. The lagoons have undergone healing since the closing of the paperboard facility in the 1990's. Willow, alder, and vegetative plants are now present. The Lagoon site is currently degraded, but recovering wetland functions. The proposed mitigation uplift actions are burying an above-ground powerline, which would eliminate bird strikes.

ODFW acknowledges that bird strikes do occur with the presence of overhead powerlines. The Lagoon site has high levels of waterfowl use and placement of the powerline underground will eliminate this loss. Placing powerlines underground would provide direct in-kind mitigation for the extensive powerlines that will be constructed to serve the JCEP LNG terminal. However, it is unknown if heavy metals remain in the soils at the site. ODFW recommends a toxicity survey prior to considering this site fully as a mitigation area.

In-perpetuity stewardship of the parcel is considered highly valuable for preventing development impacts that potentially might occur. However, the parcel offers no immediate offset for the impacts at the JCEP site and does not result in added benefit ecologically for degraded function. ODFW does consider re-seeding beneficial, however, this will only involve a small portion of the property. It is unclear if a brownfield survey needs to be completed to ascertain if there could be improvement of the site through removal of toxic chemical compounds. ODFW previously

recommended a number of actions that could provide uplift at the site including planting of waterfowl desirable plant species (e.g. wapato, wild rice, American sloughgrass), which would in part replace lost function for disturbance impacts to waterfowl in Henderson Marsh adjacent to the JCEP Terminal that will be degraded/eliminated. Function of the site for fish and wildlife could improve with several actions that are not proposed such as: 1) planting of Sitka spruce *(Picea sitkensis)* at appropriate elevations; 2) management of non-native beach grass combined with planting of native species; and 3) in-perpetuity control of non-native plants 4) placement of wood-duck nest boxes. If public access were allowed in perpetuity, ODFW recognizes the highly valuable benefits for recreational resources that the Lagoon Site could provide.

Overall, ODFW appreciates the JCEP project numerical accounting of upland impact quantity the long-term coordination through time with David Evans and Associates, and other consultants, to develop habitat categorization (Tables 4 and 5) in accordance with the ODFW Fish and Wildlife Mitigation Policy, as well as extensive efforts to locate appropriate mitigation. There are, however, discrepancies in the acreages between the Terminal Upland Habitat Mitigation Plan and Resource Report 3 (Table 1 in Appendix A; RR-3 Table 3.3.2). Resource Report 3 indicates 194.1 acres of habitats will be permanently impacted and another 227.4 acres will be temporarily impacted for construction staging for a total of 427.9 acres. In the body of the CMP the impacts (Tables 4 and 5) are listed as 345.8 acres of impact. It is also unclear if the accounting tables include impacts at the South Dunes site where workforce housing will be located and construction staging for the LNG terminal will be partially based.

PCGP Pipeline Impacts and Mitigation

General Comments

The PCGP (pipeline) portion of the project proposes construction of a 36" steel gas pipeline from the North Spit of Coos Bay, Oregon (229 miles) to Malin, OR in order to connect the JCEP export facility to the Ruby Pipeline carrying gas primarily from the Rocky Mountain region. The pipeline will cause significant direct and indirect impacts to fish and wildlife habitat, as well as the indirect impacts to water quality associated with an increase in watershed runoff caused by this project, particularly in areas where the pipeline is proposed on slopes exceeding 50%, and where vegetation will be removed from riparian corridors. Impacts are likely within the Coos, Coquille, South Umpqua, Upper Rogue, Upper Klamath, and Lost River watersheds.

ODFW remains concerned that mitigation planning for the pipeline has not adequately addressed impacts to state standards. Again, please see the ODFW letters referenced on Page 1 of this letter for a more thorough articulation of the impacts and mitigation insufficiencies.

While the applicant and federal agencies have attempted to address habitat mitigation needs for the marbled murrelet, northern spotted owl, and for wetlands and waterways, there is still no habitat mitigation planning for the other upland wildlife habitats impacted by the proposed pipeline. For example, in addition to conifer forests, the pipeline also passes through sagebrush shrub-steppe, juniper woodland, and oak woodland habitats. These habitats are important for a number of Oregon Conservation Strategy Species and as winter range for big game species. It is anticipated that the pipeline would have both temporary and permanent impacts to habitat quantity and quality in these vegetation communities, and yet offsets have not been proposed to

meet state standards. This is a significant deficiency in the project proposal, both within- and outside of – the Coastal Zone Management Area.

Please refer to the sections below for a more detailed discussion of pipeline impacts and mitigation insufficiencies.

Pipeline Impacts to Water Quality and Quantity

It is the policy of the State of Oregon to maintain all species of fish and wildlife at optimum levels and prevent serious depletion (ORS 496.012, ORS 506.109). Water quality and quantity is an important need for all Oregon's fish and wildlife.

In many Oregon statutes and rules, ODFW is directed to provide comments to Oregon Water Resources Department (OWRD) regarding water use applications, permit extensions, or transfers of use (OAR 690-033, especially sections 120-140, 230, and 330) for new water applications; OAR 690-315 for extensions, and OAR 690-380 for transfers). As the state agency with fish and wildlife expertise, ODFW provides technical assistance to OWRD to ensure water use applications adequately protect fish and wildlife. ODFW also provides technical assistance to Oregon Department of Environmental Quality (ODEQ) related to water quality standards and Total Maximum Daily Loads (TMDLs) for their 401 Water Quality Certification permit program (ORS 468 and 468B; OAR 340-048; OAR 340-041). Many ODFW rules come into play in the development of this technical assistance, but the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635-415) provides the overarching framework and is used as the implementing rule for ORS 496.012 and 506.109.

It is ODFW's understanding that the JCEP/PCGP applicants will be applying for OWRD applications after FERC's decision and prior to construction. It is also ODFW's understanding that the JCEP/PCGP applicants have not yet submitted their ODEQ 401 Water Quality Application. While ODFW does not have a comment on the sequencing of permit applications per se, FERC should be aware that some of the approaches outlined in the FEIS do not currently align with state standards. ODFW provides the following comments to FERC in an effort to address the expected impacts to water quality and quantity in the project area, and to highlight for you the insufficiencies in the project's current plans.

In order to review the potential impacts to water quality and quantity, ODFW reviewed the applicant's response to ODFW's DEIS comments, the FEIS (Part 1 – 3), FEIS Appendix R Part 2, the Jordan Cove Comprehensive Mitigation Plan (CMP) Main Document, and CMP attachments 5 (Conservation Measures), 12 (Groundwater Monitoring and Mitigation Plan), and 21 (PCGP Hydrostatic Testing Plan). ODFW's comments herein largely pertain to water withdrawals for the hydrostatic testing and dust control measures.

Water availability: In FERC's response (comment # SA2-225; Appendix R part 2) to ODFW DEIS comments, and elsewhere in the FEIS, FERC states "*We have included a limitation on water withdrawal to no more than 10 percent of the flow at the time of withdrawal. This flow reduction even in low flow would be adequate to protect resources. The flow restrictions process is handled through the State permitting. The State through this process can implement requirements deemed necessary to meet the State's permit requirements*". Again on page 79 of the CMP, the applicant states "overall change in any specific reduction in streamflow from [dust

abatement] would likely be unsubstantial". ODFW does not find this response adequately addresses state standards. There are specific periods of time each year that instream flow targets in Project area streams are unmet. When instream flow targets are not met, a further reduction of 10% of the flow will impair or be detrimental to aquatic life. The response does not describe a contingency plan for when the State (through OWRD) determines water is not available or would harm aquatic life (through comments from ODFW or ODEQ). If a State permit is denied, water should not be withdrawn, even if limited to 10% of flow. Mitigation may also be required by OWRD, and the applicant should contact OWRD for more information.

Identification of instream water rights: When instream flow targets are not met, a further reduction of any flow will impair aquatic life, and OWRD may deny an application or require mitigation for new water use. Oregon statute requires transfers that injure an instream water right to provide a net benefit to the resource. Mitigation for a reduction of flow and impacts to fish and wildlife can be expensive and difficult to obtain. In FERC's response to ODFW DEIS comments, FERC states "*We assume that the State would determine if the Project is in compliance with the State requirements and OARS during their review of the Applicant's State permit applications. The State can include the requested information and mitigation as part of their State Permit requirements*". FERC is correct that it is the State's authority to determine compliance. However the applicant should be aware that a denial from OWRD could impact their construction timing. Preliminary identification of mitigation options in the project plans would lessen this risk.

Hydrostatic Testing and Dust Abatement: ODFW identified a number of issues associated with the PCGP's plans for hydrostatic testing and dust abatement. Those are outlined below.

The CMP (p. 15) states an intent to *"[include] screening intake hoses to prevent the entrainment of fish and other aquatic organisms, meeting NMFS screening criteria, and regulating the rate of withdrawal to avoid adverse impact on aquatic resources or downstream flows*". ODFW acknowledges the intent to meet screening criteria. However, regulating the rate of withdrawal should comply with OWRD permitting requirements, which may determine that withdrawal is not allowable. Contingency plans for any denials from OWRD have not been provided in the project's plans.

The CMP – Attachment 5 Conservation Measures states (p. 5; and again in the PCGP Hydrostatic Testing Plan) that all hydrostatic test water will be obtained from commercial or municipal sources, private supply wells, or surface water sources permitted through OWRD. The PCGP applicant should check with OWRD to ensure hydrostatic testing is a permitted use of targeted water rights. Oregon statute requires transfers that injure an instream water right to provide a mitigation net benefit to the resource. If mitigation cannot be obtained, OWRD may deny the application.

ODFW understands PCGP will release water within the same basin from which it was withdrawn, or will use pump screening to prevent invasive species transmission. ODFW believes consideration should also be given to the reduction in water quantity from the out-of-basin transfer of water.

The CMP – Attachment 12 Groundwater Monitoring and Mitigation Plan does not cover impacts to habitat from the diminishment of the quality or quantity of seeps and springs, only to water right holders. Seeps and springs play a crucial role for aquatic life in the State of Oregon.

Risks of Horizontal Directional Drilling

ODFW does not find that the risks of the pipeline's proposed horizontal directional drilling (HDD) under Oregon's waterways have been adequately assessed, nor that plans have adequately demonstrated that impacts to fish and wildlife would be avoided, minimized, or mitigated according to state regulatory standards (OAR 635-415; ORS 496.012; ORS 506.109).

While HDD can be less impactful than open-cut methods of crossing waterways, there are still risks for aquatic habitats associated with HDD including: 1) potential frac-out (the unintentional leak of drilling fluids through fractured rock) and subsequent drilling fluid "mud" delivery to the water column; 2) drill bore site soil rutting/denigration and soil erosion to the waterway; 3) drill bore site impacts to wetlands and riparian habitats. Release of drilling fluid ("mud") into waterways can result in heavy sediment plumes that potentially embed in fish spawning gravels, reduce fish ability to pursue food items due to poor visibility, and impact fish respiration by covering gill filaments.

ODFW's experience with other pipeline HDD projects in southwestern Oregon has shown that frac-outs can and do occur, as was the case on the 2003 Coos County Gas Pipeline HDD which had multiple frac-outs that spilled harmful chemicals and drilling mud into fish-bearing streams.

To address this risk, ODFW recommends that monetary bonds be retained at all the HDD sites on this project to cover mitigation costs associated with a frac-out event and the resulting fish/wildlife losses and habitat damages. The ODFW Fish and Wildlife Habitat Mitigation Policy states "the Department may recommend or require the posting of a bond, or other financial instrument acceptable to the Department, to cover the cost of mitigation actions based on the nature, extent, and duration of the impact and/or the risk of the mitigation plan not achieving mitigation goals" (OAR 635-415-0020(6)).

HDD in Coos Bay: In a meeting between the applicant and ODFW on January 3, 2020, the applicant noted that they will be revising the Coos Bay HDD plan to include: 1) that there will not be a need for dredging of equipment access channels to the drill bore site; 2) that the language will be adjusted in the HDD plan for the dual HDD with tie-in option. This revised written plan is necessary for ODFW to determine if the plan will sufficiently address concerns.

In the applicant's HDD plans, ODFW notes a limited number of geotechnical borings along the two-mile HDD line under Coos Bay. ODFW remains concerned that the frac-out risk may not have been adequately analyzed. This concern needs to be resolved prior to ODFW having sufficient information to determine if the proposed crossing strategy is considered a "reliable" method under OAR 635-415.

ODFW and the applicant are currently in discussions concerning the IWWW timing for the Coos Bay HDD. ODFW recommends the standard October 1 to February 15 IWWW for drilling. In addition, ODFW has strongly encouraged the applicant to construct the preparatory bore site pads during drier months, and to include access construction with rock base to prevent site

rutting and sediment transport during wetter months. ODFW needs resolution of Coos Bay HDD construction timing prior to full assessment of the ability to meet the standards of the ODFW Fish and Wildlife Habitat Mitigation Policy.

Rogue River HDD Crossing: ODFW is highly concerned with the potential for frac-out risk at the Rogue River HDD site. The project engineering/design plans identify the pipeline crossing for the Rogue River is at milepost 122.6. The geotech survey indicates the pipe will be 56ft below the surface of the lowest thalweg location of the Rogue River, which may provide substantive overburden protection. However, a release of drilling fluid through the riverine and streambank portions of the 4,200+ft HDD would deliver drilling fluids directly to active Rogue River flow.

This reach of the Rogue River is just downstream from Trail Creek, and provides critical spawning habitat for endemic Rogue Basin spring Chinook *(Oncorhynchus tshawytscha).* Construction of William Jess Dam/Lost Creek Reservoir reduced the amount of spawning habitat available for spring Chinook salmon on the Rogue River. Spring Chinook spawning habitat is now limited to approximately 30 miles of the river just downstream of a barrier dam at Cole Rivers Fish Hatchery. Spring fed Big Butte Creek is the only tributary of the Rogue that is used by spawning spring Chinook on an annual basis. Because of dam construction, habitat volume is considered a limiting factor for the population in the Rogue Spring Chinook Salmon Conservation Plan (ODFW 2007).

Surveys conducted by ODFW during 2016-2018 found that, unlike some other rivers on the west coast, the Rogue spring Chinook population maintains a strong component of fish that are homozygous for the allele(s) that determine spring migration. Introgression with fall chinook genetic material is limited. Therefore, despite the limited habitat volume described above, the Rogue River maintains a genetically healthy population of spring Chinook. This knowledge has further increased the need to protect the ecological function of habitat that remains for this important population. A mistake here could have profound consequences.

Coos, Umpqua, Rogue, and Klamath Rivers HDD Work Timing: In addition to the monetary bonding recommended above to cover fish/wildlife population or habitat mitigation costs in the event of a frac-out, ODFW recommends the following as it pertains to ODFW In-Water Work Windows (*see ODFW 2008 "Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources*).

- Coos HDD: The applicant has proposed performing the Coos River HDD during the October 1 to February 15th In-Water Work window (BA, Appendix M pdf pg 3). The PCGP proposed crossing at Lillian Creek of the Coos River is 2.3 miles downstream from the location where the prescribed ODFW In-Water Work window is July 1 to September 15th. ODFW considers the risks associated with equipment/drill bore soil disturbance during wet weather as the greater habitat function risk for this site and recommends the July 1 to September 15th In-Water Work window period for this HDD.
- Umpqua #1 Direct Pipe: The applicant has proposed the South Umpqua River Direct Pipe installation for July 1 to August 31st, (BA, Appendix M pdf pg 25), which is the standard In-Water Work window for this reach of river. ODFW concurs with use of this window for the Umpqua Direct Pipe.

- Rogue HDD: The applicant has proposed the Rogue HDD for June 15th to August 31st, (BA, Appendix M pdf pg 40), which is the standard ODFW In-Water Work window for this location. ODFW concurs with use of the proposed In-Water Window for the Rogue HDD crossing.
- Klamath River HDD: The applicant is proposing to implement this HDD during the July 1 to January 31st period (BA, Appendix M pdf pg 55). ODFW concurs with use of the proposed In-Water Window for the HDD crossing.

Pipeline Impacts to Forest Habitats in the Coast and Cascade Ranges

The comments in this section address the following impacts of the proposed pipeline to terrestrial wildlife that would be authorized by federal decisions from FERC, BLM, and USFS:

- Incomplete analysis of the Blue Ridge Variation
- Marbled murrelet habitat impacts and mitigation
- Northern spotted owl habitat impacts and mitigation
- Sufficiency of proposed mitigation in offsetting habitat loss for marbled murrelet, northern spotted owl, and other wildlife.

Incomplete Analysis of Blue Ridge Variation

In order to assess the impacts of this project on fish and wildlife, ODFW reviewed a number of sections within the FEIS. To the extent ODFW was able to review the tremendous volume of information, and the various versions of documents that have been submitted to the FERC docket, ODFW reviewed FEIS Sections 2.1.3, 2.1.4, 2.1.5, 2.6.3, 4.6, FEIS Appendices F.1 through F.12, and the Comprehensive Mitigation Plan provided by the Applicant to FERC and Cooperating Agencies in September 2019. ODFW also reviewed the FERC Biological Assessment (filed July 29, 2019, and included as part of Appendix I of the FEIS).

The FEIS Section 2.1.3 discusses impacts of the PCGP pipeline on Late Successional Reserve (LSR) and wildlife habitat in terms of acres, miles, and extent. However, it is not clear in every case that the numerical estimates represent the original proposed action in the DEIS or the newly-recommend Blue Ridge Variation. In some cases, for example in the BLM's summary of impacts (Section 2.1.4 and Section 4.6), the impact of the Blue Ridge Variation on total acres of impact for marbled murrelet suitable habitat and total acres of impact for the northern spotted owl are not provided. An acreage summary is only provided for those portions of the LSR crossed by the PCGP project where NSO and marbled murrelet habitats overlap. In this case, ODFW is unable to accurately assess habitat loss and address that loss in its comments.

ODFW also observed that the Biological Assessment in the FEIS, which was recently analyzed by the USFWS and NOAA, does not include the Blue Ridge Variation (NOAA Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response issued January 10, 2020; USFWS Biological and Conference Opinion issued by USFWS on January 17, 2020).

Without complete information quantifying the wildlife impacts of the Blue Ridge Variation, ODFW cannot fully assess the impacts and compare the consistency of the proposed mitigation with state standards.

Marbled Murrelet Habitat Impacts and Mitigation

The PCGP pipeline would cross occupied suitable habitat for the marbled murrelet. Marbled murrelet occupied suitable habitat would be impacted by both route variations under consideration, including the originally-proposed route analyzed in the DEIS and the new Blue Ridge Variation.

Marbled murrelets in Washington, Oregon, and California were listed as threatened under the federal Endangered Species Act in 1992, and were subsequently listed as state-threatened in Oregon under the Oregon Endangered Species Act in 1995. The species is listed as state-endangered in both Washington and California.

Nesting habitat loss and degradation is one of the primary threats to sustaining populations of the marbled murrelet. There is strong evidence of large-scale loss of older forests since European settlement within the marbled murrelet range in the Pacific Northwest and northwestern California (e.g., Booth 1991, Teensma et al. 1991, Bolsinger and Waddell 1993, Ripple 1994, Perry 1995, USFWS 1997, Wimberly et al. 2000, McShane et al. 2004, Strittholt et al. 2006, Ohmann et al. 2007, Davis et al. 2015). In the Oregon Coast Range, Wimberly and Ohmann (2004) estimated that large-conifer forests declined by 58% between 1936 and 1996, with corresponding increases in small-conifer forests during this period. Habitat loss and degradation were primary factors in the initial federal and state listings of the marbled murrelet in the 1990s (CDFG 1994, ODFW 1995, Desimone 2016, USFWS 1997, 57 FR 45328). Since the 1990s, further habitat losses have occurred, mainly due to timber harvest on non-federal lands and wildfire on federal lands (Raphael et al. 2016a).

Past habitat removal has created large gaps that fragment population distribution within the core of the marbled murrelet range (Ralph et al. 1995a, USFWS 1997, RIT 2012). In Oregon, large habitat gaps occur in the northwest portion of the state as well as the coastal strip between Reedsport and the Siskiyou Mountains (RIT 2012; Fig. 2 in ODFW 2018). Most remaining nesting habitat persists on federal lands in Oregon, including the Siuslaw and Rogue River-Siskiyou National Forests, forests owned by the Bureau of Land Management, and the state-owned and managed Tillamook, Clatsop, and Elliott State Forests (Raphael et al. 2016a; Fig. 2 in ODFW 2018). The full extent of occupied habitat on private lands is unknown since state regulations for forest practices do not require pre-project wildlife surveys by private landowners (Tucker and Weikel 2017a). However, marbled murrelet nesting habitat is generally assumed to be low on private lands given available forest stand inventory and harvest data (Greber et al. 1990, Ohmann et al. 2007) and ODFW's examination of the 2012 habitat suitability data produced by Raphael et al. (2016a) for Oregon (see ODFW 2018 for details).

Other environmental impacts such as adverse oceanic conditions, climate change, effects of oil spills, and other large-scale disturbances such as catastrophic fire, are also serious additive threats to the species' survival and recovery (ODFW 2018).

The Northwest Forest Plan, created in 1994, established a system of late-successional reserves (LSR) across the range of the marbled murrelet on both USFS and BLM lands. LSRs provide suitable nesting habitat over the long term for both murrelets, northern spotted owls, and other late successional dependent species (USDA FS and USDI BLM 1994).

Category 1 Habitat Issues for Marbled Murrelet: ODFW considers occupied suitable habitat for the marbled murrelet to be Category 1 habitat according to the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635-415). Category 1 habitat is essential, limited, and irreplaceable within a reasonable time frame. The components of this determination are detailed below:

- "Occupied suitable habitat" (USFWS 2014) is defined the following manner:
    - Suitable Habitat: generally, includes old-growth forests within 50 miles of the coast and characterized by large trees, multi-storied stands, and moderate-to-high canopy coverage. Nest trees can be remnant old-growth trees in a stand of younger forest, but nest trees must have large branches or deformities such as high, moss-covered branches or branches with growths of dwarf mistletoe, which serve as nest platforms.
    - Occupied Suitable Habitat: Habitat in the vicinity of the proposed project that meets any of the following criteria:
        - Occupied Stand: is a stand that has been surveyed by the applicant, landowner, or manager, or others following the Pacific Seabird Group (PSG) protocol (Mack et al. 2003) and that encompasses an "occupied site"
        - Historically Occupied Stand: is a stand that was at any time known to be occupied by marbled murrelet. This includes stands where more recent surveys may have indicated that the status is not currently "occupied"
        - Unsurveyed Suitable Habitat (=Presumed Occupied): is an area or forested stand identified as potential nesting habitat that has not been ground-truthed for suitable nesting structures or surveyed following the PSG protocol, including areas with incomplete survey data (*e.g.*, where only one year of marbled murrelet surveys have been completed).

- The occupied suitable habitat in Oregon is "Essential" for the marbled murrelet because it supports reproduction for the species, which is a critical life history function. It is well-established that the decline in nesting habitat quantity and quality is the primary threat to marbled murrelet populations, and any further reduction would have significant impact to the population (see sources cited within ODFW 2018). The loss of this essential habitat depleted the murrelet population sufficiently to warrant listing under the federal and state Endangered Species Acts in the 1990s.

- The occupied suitable habitat in Oregon is also "Limited" for the marbled murrelet because they are tied to mature, late successional, old growth forest. As described above, an estimated 58% decline in late successional forests occurred between 1936 and 1996, and an estimated 9.2% further decline was documented between 1993 and 2012. What remains is highly fragmented, and at risk to fire, insect infestation, and disease.

- And finally, the occupied suitable habitat in Oregon is "Irreplaceable" because of the unreasonable time frame necessary to re-create late successional, old growth forests. While

trees can be replanted and forests can be managed toward old growth condition, the time it takes to create the functions and values selected for by nesting murrelets (80-year old trees, multi-storied canopy, wide platform branches) interrupts nesting opportunity for at least 5 generations. This is not a reasonable mitigation time frame to allow for mitigation to replace the lost functions and values.

The extent of occupied suitable habitat follows the 'continuous habitat' descriptions in Mack et al. (2003), meaning the delineation of Category 1 habitat should include all of the sub-canopy detection area plus all of the area extending out from the sub-canopy detection until natural breaks in habitat 100 meters or larger are encountered. Therefore, a project that proposes to impact the edge of occupied suitable habitat is still impacting Category 1 habitat.

As per the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635-415), the mitigation goal for Category 1 habitat is no loss of either habitat quantity or quality. The Oregon Fish and Wildlife Commission directs ODFW to protect Category 1 habitats by recommending (a) avoidance of impacts through alternatives to the proposed development action, or (b) no authorization of the proposed development action if impacts cannot be avoided.

Table 1 below provides a summary of ODFW's understanding of the PCGP pipeline's impacts to Category 1 habitat for the marbled murrelet. Sources used to generate these numbers include the FEIS Section 4.6 and the Effects Determination Section of the Biological Assessment (Appendix I of the FEIS). Given the volume and complexity and sometimes discrepancies among the information provided in the various planning documents for this project, ODFW seeks confirmation from the federal agencies that these estimates are in fact correct. Of note, these acreages are for the originally-proposed route as described in the current Biological Assessment. Similar summaries were not readily available for the Blue Ridge Variation.

Table 1. Summary of PCGP Pipeline Impacts to Marbled Murrelet Category 1 Habitat as Defined by the ODFW Fish and Wildlife Habitat Mitigation Policy (OAR 635 Division 415). Source for the acreages is the Jordan Cove/PCGP Biological Assessment dated July 2019.

Marbled Murrelet Known/Presumed-Occupied Suitable habitat that will potentially be….	Acres
Removed by the Right-of-Way or Temporary Work Areas (TEWAs)	78 (Approximately 71 federal, 7 private land)
Disrupted indirectly from construction noise and road noise (extending 0.25 mi from ROW)	7,145
Degraded from the indirect effects of increased edge, fragmentation, and increased predation	656

ODFW acknowledges the condition recommended by FERC, BLM, and USFS to avoid tree removal during the marbled murrelet breeding season. This is an important avoidance strategy; however, it does not offset the habitat loss associated with the permanent ROW and the TEWAs or the indirect effects of increasing forest that may degrade habitat quality over time.

ODFW does not find this level of impact to marbled murrelet Category 1 habitat consistent with the ODFW Fish and Wildlife Habitat Mitigation Policy, and therefore it is also not consistent with the State of Oregon's Wildlife Policy. ODFW recommends FERC consider alternative siting of the ROW that avoids impacts to Category 1 habitat for marbled murrelet.

Northern Spotted Owl Habitat Impacts and Mitigation

The PCGP pipeline would cross northern spotted owl (NSO) nesting, roosting, and foraging habitat. NSO habitat would be impacted by both route variations under consideration, including the originally-proposed route analyzed in the DEIS and the new Blue Ridge Variation.

Northern spotted owls are protected in Oregon by the state (listed in 1987) and federal (listed in 1990) Endangered Species Acts, where they are listed as threatened. The species also receives protections through the Oregon Forest Practices Act (FPA; OAR 629-665-0210).

NSO populations appear to have declined annually since 1985 when many studies began, and are currently declining at an average rate of 3.8 percent range-wide each year (Dugger et al. 2015). Loss and adverse modification of nesting, roosting, and foraging habitat due to timber harvesting and natural disturbances such as fire and windstorms, and competition with encroaching barred owls (*Strix varia*) have led to a decline of NSOs throughout much of their historic range (Davis et al. 2011, Dugger et al. 2015, Davis et. 2016). Wildfire has been the major cause of habitat loss on federal lands (e.g., National Forests and National Parks), where most NSO habitat is protected from timber harvesting by protective land management plans (Davis et. 2016). Timber harvest continues to be the primary cause of habitat loss on non-federal lands. Over the past decade it has become apparent that competition from the barred owl now poses a significant threat to the NSO (Dugger et al. 2015). Barred owls compete directly with NSOs for habitat and resources for nesting, roosting, and foraging.

Recovery efforts for the NSO are helping to reduce habitat loss on federal lands. Although the need for timber necessitates continued harvesting, current forest management practices stress more limited harvesting in older-age forests and suggest alternate areas for harvest which are less preferred by spotted owls. Careful planning of timber sales and forest conservation are necessary to halt the decline of the NSO. Large, continuous blocks of late-successional forest have been an element of NSO conservation strategies for over two decades.

Current management of federal forest lands in Oregon includes established network of lands reserved from logging. The Northwest Forest Plan, created in 1994, established a system of late-successional reserves (LSR) across the range of the spotted owl on USFS and BLM lands to provide suitable nesting habitat over the long term (USDA and USDI 1994). The federal forest lands outside these reserves are managed to allow dispersal between the LSRs through riparian reserves and other land allocations. In 2011, the USFWS issued a Revised Recovery Plan for the NSO that contains a wide array of recommendations, including protecting high-quality and occupied spotted owl habitat, actively managing forests to restore their health, and managing competition from the encroaching barred owl (USFWS 2011). The USFWS is currently conducting an experimental removal of barred owls from spotted owl habitat to assess the effect on NSOs. A new final rule designating critical habitat was published by the USFWS in December 2012. In 2016, the BLM replaced the Northwest Forest Plan for the management of

BLM-administered lands in western Oregon with an updated conservation strategy to maintain large, continuous blocks of late-successional forest because of new scientific information and policies related to the NSO (USDI BLM 2016a, 2016b).

Forest management operations on State and private lands in Oregon are governed by rules promulgated under the Oregon Forest Practices Act. The Act requires the Board of Forestry to adopt rules to protect Federal- and State-listed wildlife species. The Board of Forestry created NSO protection rules in 1991. The Oregon Forest Practices Act provides for protection of 70-acre owl core area around known nest sites on State and private lands. This rule is intended to protect the size of areas used by juvenile NSO prior to dispersal, which is about 70 acres (Miller 1989).

The existing science clearly establishes the importance of older more structurally-complex multi-layered conifer forests as NSO (Thomas et al. 1990, Courtney et. 2004). The NSO recovery plan recommends the maintenance of older and more structurally-complex multi-layered conifer forests (USFWS 2011). The results of previous analyses demonstrate that maintaining older and more structurally-complex multi-layered conifer forests would contribute to meeting the needs of the NSO (Davis et al. 2011, Dugger et al. 2015, Davis et. 2016). Therefore, maintaining older and more structurally-complex multi-layered conifer forest is a necessary part of the purpose of contributing to the conservation and recovery of the NSO.

Category 1 Habitat Issues for Northern Spotted Owl: While protection and enhancement of all NSO nesting, roosting, and foraging habitat (as defined in the USFWS 2014 Conservation Framework) is important for recovery of the northern spotted owl, ODFW is particularly concerned about impacts to habitat in the immediate vicinity of known nests and/or activity centers (referred to as a 'resource site' in the Oregon Forest Practices Act).

Consistent with the definitions in the Oregon Forest Practices Act (OAR 629-665-0210), ODFW uses the following definitions for terms used herein:

- 'Resource sites' consist of a 70-acre "core area" surrounding a NSO nest site or activity center of a pair of owls. The shape of the 70-acre core area depends on the characteristics of the forest, it must encompass the activity center or nest tree and consist of forest stands with structural characteristics known to represent nesting habitat for NSOs.
- On federal lands, ODFW considers known-occupied (surveyed according to protocol), historical, and presumed-occupied (unsurveyed but with relevant structural characteristics and/or designated by the federal land management agency) as NSO resource sites.

ODFW considers known/presumed-occupied resources sites for the NSO to be Category 1, meaning it is essential, limited, and irreplaceable within a reasonable time frame. The components of this determination are detailed below:

- The nesting resource site is "Essential" for the NSO because it supports reproduction for the species, which is a critical life history function. It is well-established that the decline in nesting habitat quantity and quality is one of the primary threats to NSO, and any further reduction would have significant impact to the population (as described and cited above). The loss of this essential habitat depleted the NSO population sufficiently to warrant listing

under the federal and state Endangered Species Acts in the late 1980s and early 1990s respectively.

- NSO nesting resource sites in Oregon are also "Limited" because they are tied to mature, late successional, old growth forest. As described above, an estimated 58% decline in late successional forests occurred between 1936 and 1996, and an estimated 9.2% further decline was documented between 1993 and 2012. What remains is highly fragmented, and at risk to fire, infestation, and disease.

- And finally, the NSO nesting resource sites in Oregon are "Irreplaceable" because of the extended time frame necessary to re-create late successional, old growth forests. While trees can be replanted and forests can be managed toward old growth condition, the time it takes to create the functions and values selected for by nesting NSOs (mature forest stands with multi-layered and multi-species canopy, dense canopy closure [>60%], forest with large standing and fallen dead trees, and many trees with cavities and broken tops) interrupts nesting opportunity for multiple generations. This is not a reasonable mitigation time frame to allow for mitigation to replace the lost functions and values.

As per the ODFW Fish and Wildlife Habitat Mitigation Policy, the mitigation goal for Category 1 habitat is no loss of either habitat quantity or quality. The Oregon Fish and Wildlife Commission directs ODFW to protect Category 1 habitats by recommending or requiring (a) avoidance of impacts through alternatives to the proposed development action, or (b) no authorization of the proposed development action if impacts cannot be avoided.

Based on information in the Biological Assessment (Appendix I), and the BLM and USFS Supporting Documentation (Appendix F), it does appear that some amount of Category 1 habitat for northern spotted owls will be impacted by the project. ODFW has met on a number of occasions with the project applicant to review maps of northern spotted owl resource nest sites relative to the proposed ROW and surrounding area. However, final acreages of impact to Category 1 have not been settled and would require additional time beyond what was provided by this public notice.

ODFW acknowledges the condition recommended by FERC, BLM, and USFS to avoid tree removal during the northern spotted owl breeding season. This is an important avoidance strategy. However, it does not offset the habitat loss associated with the permanent ROW and the TEWAs or the indirect effects of increasing forest that may degrade habitat quality over time.

It is clear, however, that some NSO Category 1 habitat will be impacted. ODFW does not find any level of impact to NSO Category 1 habitat consistent with the ODFW mitigation policy, and therefore, it is not consistent with the State of Oregon's Wildlife Policy. Construction of the project would remove and modify high value nesting, roosting, foraging habitat, dispersal, and capable habitat within the home range of 97 NSOs, 58 of which are currently below sustainable threshold levels of suitable habitat for continued persistence in their home range and/or core area. As such, ODFW recommends the BLM and USFS consider alternative siting design of the ROW to avoid impacts to NSO Category 1 habitat.

Mitigation Sufficiency for Marbled Murrelet, Northern Spotted Owl Category 2 Habitats: Outside of Category 1 habitats for the marbled murrelet and northern spotted owl, ODFW assumes that impacts to wildlife habitat could be offset depending on the ecological benefit and reasonableness of the proposed mitigation.

ODFW assumes that unoccupied (surveyed according to protocol) suitable habitat for the marbled murrelet would meet the Category 2 definition within the ODFW Fish and Wildlife Habitat Mitigation Policy. ODFW also assumes that marbled murrelet recruitment and capable habitat, as defined in the Biological Assessment as well as by USFWS (2014 Conservation Framework), can meet the definitions of Category 3 or lower, but that determination would need to be made on a site-specific basis given patterns of forest alteration and the existing forested stand structure.

The FEIS and supporting documents report that at least 517 acres of NSO nesting, roosting, and foraging habitat will be directly impacted by the project. The nesting resource sites within that 517 acres would be Category 1 habitat and ODFW recommends avoidance. However, ODFW would consider the remainder to fall within definitions of Category 2 according to its mitigation policy. As such, those impacts beyond the nesting resource site would likely be mitigatable.

However, without a cross-comparison of habitat impacts to habitat mitigation offsets according to the ODFW mitigation policy, it is not possible for ODFW to assess the sufficiency of the proposed mitigation actions designed to address impacts to marbled murrelet and NSO habitat. That said, ODFW provides the following feedback on the mitigation proposed in the FEIS.

Offsite Mitigation Proposed on Federal Lands: Appendix F of the FEIS contains the BLM and Forest Service Supporting Documentation, including proposed mitigation offsets for impacts to marbled murrelet and NSO. To that end, ODFW evaluated the relative merits of the proposed BLM and USFS mitigation actions. Please see ODFW protests of the BLM and USFS plan amendments referenced on page 1 of this letter for a full analysis.

ODFW recognizes the efforts of the USFS and the applicant in finding mitigation projects with features that seek to address impacts across a large and diverse landscape. Of particular note is that on the Umpqua and Rogue River National Forests, more late-successional old growth (LSOG) would be re-allocated from Matrix to LSR than would be impacted by the PCGP ROW and temporary work areas (TEWAs) within current LSR. However the FEIS does not include sufficient descriptions of whether and how the LSOG contained within the re-allocated Matrix lands matches or exceeds the quality of the LSOG being impacted by the project. Some of the mitigation actions proposed not only offset impacts, but could generate a net benefit in both quantity and quality. For example, the road decommissioning activities would reduce human disturbance impacts not only to marbled murrelet, but to other sensitive wildlife as well.

There are substantial acreages proposed for fuels reduction and stand density management on both USFS and BLM lands, which are designed to reduce the risk of catastrophic wildfire but also to potentially accelerate development of LSOG forest conditions. If properly designed with wildlife habitat goals helping to drive silvicultural plans, these projects could serve to offset the loss and degradation of habitat associated with the pipeline's construction activities. ODFW noted in the FEIS that these potential fuels reduction projects have not yet been scoped or

approved nor described in any great detail. For this reason, fuels reduction projects carry uncertainty as mitigation. In addition, planning and approvals for these fuel reduction projects would likely take considerable time and public process, so there likely would be a time lag between the PCGP project's impacts to wildlife habitat and the implementation of a fuels reduction mitigation offset. This time lag would also be inconsistent with the ODFW mitigation policy, which recommends that mitigation actions occur prior-to or concurrent with the development action.

Offsite Compensatory Mitigation: In addition to on-site mitigation measures and the proposed mitigation projects on BLM and USFS lands, the Jordan Cove Comprehensive Mitigation Plan (Main Document, Sections 2.3 and 3.3) describes voluntary compensatory mitigation for the NSO and marbled murrelet, as proposed by the applicant. Compensatory mitigation measures proposed include:

- "*PCGP has an option agreement to purchase a minimum of 1,787.6 acres (Table 3.3-1) from a private forest company in the Oregon Coast range to off-set removal of 517 acres of LSOG (equivalent to NRF) habitat and impacts to dispersal/recruitment and capable habitat. A total of 1,057.5 acres of LSOG would be acquired. Another 150.1 acres is in age class 60 to 80 years, 20 years of reaching the nominal 80-year age of LSOG. All lands would be preserved in perpetuity. In the absence of PCGP's acquisition and preservation, approximately 275 acres in age class 40 to 80 years would be harvested within 1 to 5 years. Absent preservation, all stands would be subject to harvest in the future to the full extent allowable under the Oregon Forest Practices Act*".
- *"In addition, Jordan Cove is committed to funding up to $197,400 (plus reasonable administrative overhead) to support the barred owl management program in a manner to be determined by the FWS".*
- *"PCGP is proposing to provide $350,000 (plus reasonable administrative overhead) to support a program, identified by the U.S. Fish and Wildlife Service, to reduce MAMU nest predation. The supported program(s) would be designed to reduce nest predation by corvids, generally through public outreach efforts (including seasonal interpretive rangers and materials) and control of anthropogenic food sources at Oregon State Parks that support or are adjacent to MAMU suitable habitat".*

It is possible that the applicant's proposed compensatory mitigation could offset impacts to Category 2 habitat for the marbled murrelet and NSO. The mitigation goal for Category 2 habitat impacts is no net loss of habitat quantity or quality and a net benefit of either habitat quantity or quality. The ODFW Fish and Wildlife Habitat Mitigation Policy further guides Category 2 habitat mitigation to be in-kind and in-proximity. The proposed predator management programs would likely provide valuable benefits to habitat quality for both the marbled murrelet and the NSO populations in Oregon, However, the CMP does not provide sufficient information for ODFW to determine if the proposed forest acquisition will achieve the goal of no net loss in habitat quantity. To make that determination, ODFW would need additional information regarding location, forest structure and presence of habitat features important to both species, species occupancy information, proposed habitat uplift actions for the mitigation site, and demonstrated durability of the mitigation area for the life of the PCGP project's impacts.

Mitigation for Other Forest Dwelling Species: At this time, mitigation impacts to habitat for coastal marten, fisher, and big game winter range is not fully described in the FEIS or the

Comprehensive Mitigation Plan. ODFW recommends these plans be more fully developed to the in-kind, and in-proximity standards of the ODFW mitigation policy so as to achieve no net loss of habitat.

Pipeline Impacts to Riparian Habitat and Fish-bearing Streams

The PCGP pipeline will remove a 75-foot wide swath of riparian forest at 155 fish-bearing stream crossings (PCGP Comprehensive Mitigation Plan pg ES-9) in the 229-mile route from Coos Bay to Malin. The PCGP route traverses through a number of ecoregions and stream habitats that are highly important for production of fish and wildlife linked to aquatic habitats including: Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*) (ESA threatened), fall and spring Chinook salmon (*O. tshawytscha*), Pacific lamprey *(Entosphenus tridentata),* Lost River sucker *(Catostomus luxatus/Deltistes luxatus),* winter steelhead *(O. mykiss irrideus),* coastal cutthroat trout (*O. clarki clarki*), river otter *(Lutra canadensis*), mink *(Neovison vison),* American beaver (*Castor canadensis*), common merganser *(Mergus merganser*), and numerous others.

Although a large number of the proposed pipeline stream crossings are on private land, a notable smaller number are on BLM lands in the Coos Bay, Roseburg, Medford, and Klamath Falls districts. Additionally, there are proposed pipeline stream crossings on the USFS Winema and Rogue National Forests. Please see the aforementioned ODFW Protests of the BLM Resource Management Plan Amendments and USFS Forest Plan Amendments for a more detailed description of the potential stream impacts.

The potential negative effects to aquatic/stream habitats through implementation of the PCGP project will reduce the productive value of the habitats of native fish and amphibians that use these streams and waterways. ODFW has evaluated both the direct and indirect impacts the proposed PCGP project would have in relation to stream, river, and wetland habitats and the subsequent effects to productive capacity of these habitats for native fish and wildlife. ODFW recommends further development of avoidance and mitigation measures to address these concerns.

Upland Steep Slope and Pipeline Corridor Sediment Concerns

There are numerous critical concerns with the risk of placing the PCGP pipeline on steep slopes, especially when the pipeline is routed perpendicular to slopes. Coastal sandstone soils are highly susceptible to mass-wasting when undercut, deconsolidated, de-vegetated, and generally disturbed. The excavation of the pipeline trench and associated soil disturbance will unconsolidate soils removing the ionic bonds of the colloids resulting in a highly erosive condition. A secondary factor, the extensive access road network that will be created to access the pipeline installation and facilitate pipeline maintenance, will further create potential for mass-wasting slope failures and general sediment production over the current condition. Stream productive capacity for numerous anadromous fish streams in the Coos and Coquille River basins has been assessed as “poor” (scale: “very poor”; “poor; fair”; “good”; “excellent”) with similar stream health conditions in the South Umpqua River basin, and varying health of streams in the Rogue and Klamath basins. This “poor” condition rating is in many cases related to upland disturbance factors that have increased sediment loading and the loss of riparian forest and LWD since 1900. Sediment transport to streams is considered a substantial factor currently suppressing

recovery of OC coho salmon. Extensive research has documented the impacts of sediments to salmonids.

A number of miles of the pipeline will be constructed on slopes that are adjacent to slopes that exceed 50% or on slopes that are over 30%. Tyee sandstone geology in the Coos and Coquille River basins and the geology of the Rogue Basin to a lesser degree are highly prone to landslides if the supporting matrix is disturbed. Klamath basin streams are also vulnerable to impacts from erosion and sediment delivery. Chronic turbidity is a substantive force currently suppressing ecological productivity for salmonids in these watersheds. Mass wasting debris torrents and general erosion are considered a substantial threat to the function of stream habitats for ESA listed and non-ESA listed salmonids, and the wildlife that depend on these fish.

The PCGP will result in timber removal initially that is 95 feet in width. Within the logged corridor of the pipeline, the trenched area will include full excavation of the soil profile and adjacent ground disturbance from heavy equipment. In addition to the PCGP and the associated ROW, numerous access roads will be built to harvest timber and for pipeline construction. These activities will likely create conditions that produce new sources of both acute and chronic sedimentation.

ODFW continues to recommend interagency coordination to design measures of avoiding, minimizing, and mitigating the impacts of erosion and sediment transport of sediments into Oregon's stream networks. Management of erosion and transport of sediments to stream networks is foundationally critical for enhancing spawning and rearing habitat for fall Chinook salmon, OC coho salmon, Pacific lamprey, winter steelhead and coastal cutthroat trout as water quality is directly linked to hatch rates and food available for these species. Sediment loading above natural background levels contributes to embedding of substrates, which often results in reduced hatch rates for eggs in redds, inability of fry to emerge from redds, inhibited production of macroinvertebrates (invertebrates largely live in the interstitial spaces of gravels), and impacts on the ability of fish to obtain food due to the nature of salmonids to feed predominantly by using their sight (Burns 1970; Hall and Lanz 1969;Weiser and Wright 1988; Suttle et al. 2004; Tripp and Poulin 1992; Waters 1995). For these reasons, ODFW has repeatedly made recommendations to FERC and the Cooperating Agencies that there be interagency coordination in order to fully address these resource concerns.

Pipeline Aquatic Habitat Mitigation Sufficiency Review

Nearly all aquatic habitats that will be affected within the 229-mile PCGP corridor have a habitat categorization of 4 or higher, and ODFW recommends the impacts be offset to achieve a mitigation goal of no net loss (per OAR 635-415). However, habitat categorization was not included in the FEIS and is based on draft maps ODFW received from the project applicant. Please see the aforementioned ODFW Protests of the BLM Resource Management Plan Amendments and USFS Forest Plan Amendments for a more detailed description of the potential stream impacts.

Some of the proposed mitigation for aquatic impacts is not in-proximity. For example, in the Coos River basin where over 20 miles of pipeline impacts occur to stream/aquatic habitats, no mitigation projects proposed in that HUC 4 watershed were identified. A number of these stream

and upland impacts will directly or indirectly impact estuarine wetlands and coho habitat that are considered essential and limited (category 2) according to state standards.

Stream Crossing/Riparian Mitigation: The BLM and USFS have been asked to develop a large number of mitigation projects to address PCGP impacts including stream crossing riparian forest removal.

- Temperature***:*** The applicant's modeling fails to address cumulative impacts that can occur within watersheds over a relatively short stream distance and temporal period. Although modeling suggested that 0.3˚F is likely to be the largest thermal impact to a stream segment through installation of the PCGP for an individual stream, this can be largely increased if other landscape projects (e. g. timber harvest, road building, home construction, fire, etc.) within a watershed are within the time period prior to recovery of the shade component at a particular impact location. The CMP identifies 44 projects on BLM lands (CMP pdf pg 30) designed to mitigate directly for aquatic impacts, and another 13 projects on USFS lands. These projects range from fish passage and sediment management to placement of LWD. However, the mitigation does not identify any projects that directly produce in-kind canopy mitigation for harvest of trees adjacent to the PCGP 155 stream crossings. The PCGP project has offered a single project designed to specifically develop riparian canopy on Spencer Creek in the Winema National Forest. However, local ODFW staff believe the likelihood this project would produce substantive ecological benefit is low, because degraded stream conditions downstream will nullify benefits. In order to address riparian forest impacts associated with the PCGP, ODFW's DEIS comments included recommendations for projects to align with the ODFW Fish and Wildlife Habitat Mitigation Policy mitigative actions that are "In-Kind." For example, projects that enhance stream buffers on private forest lands through long-term or in perpetuity easements would serve as direct ecological benefit for impacts. ODFW recommends that FERC revisit and adopt ODFW's DEIS comment recommendations to sufficiently mitigate for these impacts.

- Loss of future LWD potential***:*** The removal of the riparian forest from stream crossings to facilitate the PCGP will result in mostly permanent impacts. ODFW does recognize that over a long-term period there will be some encroachment into the access corridor by riparian forest up to the boundaries of the allowable ROW, which will provide limited recovery. However, there will be a habitat function gap in these segments through time. Large Woody Debris from the stream adjacent slopes and upslope to Stand Potential Tree height will not be allowed to grow and recruit to streams within the PCGP corridor. This zone will be managed for low stature ground cover vegetative species that will not replace lost function of the timber overstory. ODFW has calculated that the PCGP project has potential to remove up to 8,073+ trees (based on standard observed stocking rates in riparian habitats) in the PCGP stream crossing zones. If conservatively one-half of these trees through time are likely to fall towards and into the stream, then a total of 3,836 trees would be removed that would have potentially been available for creation of LWD instream complexity. The review of proposed mitigation on federal lands to offset impacts of the PCGP collectively identifies placement of 1,257 individual LWD pieces.

This results in a in a direct mitigation inequality of 2,597 trees. ODFW recommends that the federal cooperating agencies and applicant develop a coordination plan with ODFW for the overall goal of evaluating the lost functions of the PCGP impacts within the ODFW mitigation policy framework and corresponding mitigation actions.

ODFW recognizes that a notable quantity of soil stabilization projects will be implemented during construction of the PCGP. These BMP's are important for minimizing effects, but recovery of permanent ground cover vegetation to reach maximum effectiveness will likely take 5-8 years at some locations. After that time the pipeline corridor will be vulnerable long-term to greater soil erosion due to lack of overhead canopy that softens rainfall patterns. The proposed access road networks will likely have long-term chronic effects to fish and wildlife unless seeded, mulched, and closed. The pipeline corridor will have elevated sediment delivery for a number of years post-project despite BMP's. Additionally, there will be a greater potential for landslides to occur within the corridor due to the lack of timber following construction that currently provides hydrograph buffering through evapotranspiration processes that reduce overall water yield resulting in more modest forces on soils and stream morphology.

Comparison of Proposed BLM and USFS Mitigation and ODFW Mitigation Policy: ODFW reviewed the proposed PCGP riparian, wetland and waterbody mitigation projects (Jordan Cove CMP Attachment 28 PCGP Wetland Waterbody Riparian Mitigation Plan, Revised July 2018, and Attachment 11 Forest Service Proposed Amendments and CMP, March 2019). ODFW is unable to confirm that mitigation actions will meet the definitions and standards of the ODFW Fish and Wildlife Habitat Mitigation Policy because of:

1) Very limited location information
2) Little or no current condition information
3) A lack of information on the exact treatment that will provide offset/ecological uplift.

ODFW recommends further development of the mitigation proposals through interagency coordination. Some of the proposed BLM and USFS mitigation projects would be considered by ODFW to meet the threshold of in-kind because they would help to reduce sediment production/delivery to streams and waterways. However, not all projects would meet this threshold. The array of projects includes: road sediment abatement, road drainage, and replacement of failing culverts, which have potential to provide correlative benefit to offset the potential turbidity impacts of the PCGP project corridor and road construction ground disturbance. However, given the limited information available to ODFW at this time, it is not entirely clear how the proposed projects will achieve the mitigation goals of no net loss and net benefit in habitat quantity and quality.

In order to properly assess whether the sediment abatement projects meet the rigor of fully mitigating for impacts, ODFW recommends complete information on the proposed project actions including at a minimum:

1) GPS location and detailed current condition of habitat function(s) or lack thereof
2) Previous land management actions within the HUC 6 of the proposed project that are relevant to the proposed uplift
3) Fish passage status of upstream/downstream reaches from the project area
4) Future land management strategies proposed at the HUC 6 level that may affect performance of the project in the future

Concluding Remarks

ODFW requests FERC give full consideration to ODFW's concerns and recommendations provided herein, and the letters referenced on page 1. ODFW does not find the JCEP/PCGP plans contained within the FERC FEIS to be fully consistent with the State of Oregon's fish and wildlife protection statutes and rules. ODFW is open to working with the applicant and the federal and state regulatory agencies to try and resolve these remaining issues. Your primary point of contact continues to be Sarah Reif, Energy Coordinator, who can be reached at sarah.j.reif@state.or.us or 503-947-6082.

The analysis and comments in this letter were authored by the following ODFW staff:
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Thank you for your consideration of Oregon's fish and wildlife resources.

Sincerely,

Sarah Reif

Sarah Reif
Energy Coordinator

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February 10, 2020

FILED FERC DOCKET (CP17-494; CP17-495) AND COURTESY COPY VIA U.S. FIRST CLASS MAIL

Ms. Kimberly D. Bose
Federal Energy Regulatory Commission Secretary
888 First Street N.E., Room 1A
Washington, D.C. 20426

RE: Jordan Cove LNG LLC and Pacific Connector Gas Pipeline LP FERC Authorizations; Related Final Environmental Impact Statement

Dear Ms. Bose:

As the Federal Energy Regulatory Commission prepares to release a Record of Decision for licenses for the proposed Jordan Cove LNG Export Terminal and the associated proposed Pacific Connector Gas Pipeline, the Oregon Department of Environmental Quality (ODEQ) wishes to bring several matters to your attention, in order to assure FERC has a clear understanding of the record concerning ODEQ before it acts.

On October 24, 2017, the U.S. Army Corps of Engineers (Corps) notified ODEQ that it had received an application from Jordan Cove LNG LLC and Pacific Connector Gas Pipeline LP, (hereafter referred to as "Jordan Cove" or the "Applicant") for Section 404 (Clean Water Act, or CWA) and Section 10 and 14 (Rivers and Harbors Act) permits related to construction and operation of LNG facilities and an associated pipeline (collectively, the "Project"). The Corps notified ODEQ, as the two agencies coordinate routinely on 404/401 projects and, as part of this coordination, ODEQ administrative rules provide that:

> "The department will coordinate with the Corps in the processing of [federal Clean Water Act section 401] certification applications for activities requiring permits from the Corps pursuant to Section 404 of the Clean Water Act, as follows:
>
> (1) An application to the Corps for a permit constitutes an application for certification, * * *." OAR 340-48-0032.

Consistent with the Corps' regulations, the Corps determined the Jordan Cove application of October 24, 2017, was incomplete on November 3, 2017.[1] Accordingly, the Corps requested additional information from November 2017 through May 2018 before the Corps determined on

[1] 33 C.F.R. 325.1 (2018).

May 6, 2018 that the application was complete. On May 6, 2019, ODEQ denied, without prejudice, the requested certification as the record before ODEQ at that time failed to demonstrate that the construction and operation of the Project would comply with applicable state water quality standards.

ODEQ has never received an application for 401 water quality certification from the applicant for the proposed FERC license and authorizations associated with the Project.[2] In earlier correspondence, Jordan Cove has at times appeared to assert that its 404 application to the Corps also constituted an application for 401 certification necessary for FERC's actions. However, in addition to the fact that the scope of activities differs between what the Corps' and FERC's authorizations would enable, an application for certification for federal licenses or permits, other than Corps 404/section 10 applications, must be filed directly with ODEQ,[3] and as stated above, ODEQ has no record of such a filing.

Jordan Cove has worked with ODEQ over the past seven months in preparation for filing an application for certification for both FERC's and the Corps' authorizations, and had indicated that it would file such an application on January 14, 2020, but shortly before that date, cancelled a pre-filing meeting with ODEQ and indicated that it had no set timetable for filing despite requests from ODEQ.

This letter is intended to assure that FERC understands the status of 401 certification for the Project before its anticipated decisions relevant to the Project. The record before FERC at this time contains only ODEQ's denial of the requested 401 certification for the Corps' authorizations for the Project. There is no pending application for certification for the requested FERC authorizations, and no application was ever filed. ODEQ is not aware of any FERC precedent where it has acted on a license for a LNG facility or a certificate of public convenience and necessity for an interstate natural gas pipeline before the applicant applied for water quality certification under section 401 of the federal Clean Water Act, and ODEQ is concerned with the potential authorization of activities that will affect water quality before an application for 401 certification has even been filed.

Finally, ODEQ notes a number of places in FERC's Final Environmental Impact Statement (EIS), requiring correction. ODEQ has listed these below:

- Table 1.5.1-1, page 1-25, Section Water Quality Certification Section 401 of the CWA:

---

[2] 18 C.F.R. 5.18(b) requires that "[t]he applicant must file a *request* for a water quality certification (WQC), as required by Section 401 of the Clean Water Act no later than the deadline specified in §5.23(b)." (emphasis added). Section 5.23(b) requires the applicant to file the certification no later than 60 days after the date FERC issues notice of acceptance and ready for environmental analysis.

Further, Jordan Cove confirmed on several occasions that materials related to the Project that were sent directly to ODEQ were supplements to its 401 application for the Corps Section 404 and Section 10 permits, and that such materials did not constitute a separate application for 401 WQC for other federal authorizations required for the Project. Letter from Jordan Cove to Mary Camarata, ODEQ (December 7, 2018); Letter from Derik Vowels, David Evans and Associates, Inc., to Mary Camarata, ODEQ (Feb. 6, 2018).

[3] OAR 340-048-0020(1) ("Applications for certification must be filed with the department, except for applications filed with the Corps pursuant to OAR 340-048-0032.").

"Applicant submitted their CWA Section 401 application package to the ODEQ on April 6, 2018. On September 25, 2018, the Applicant requested that the 401 application be withdrawn and resubmitted to allow ODEQ additional time to consider the request. On May 5, 2019, the ODEQ denied the application without prejudice."
Correction: Consistent with the Corps' regulations and Oregon state law, the Corps' public notice indicating its receipt of a complete Section 404 application constituted an application to ODEQ for 401 certification: ODEQ received the Applicant's 401 application for the required Corps' authorizations on May 6, 2018.

- Table 1.5.1-1, page 1-25, Section 402 of CWA, Issue National Pollutant Discharge Elimination System (NPDES) permits for discharge of stormwater, NPDES permit for storm water (e.g., effluent discharge to the ocean outfall) issued in July 2015 and expires in June 2020.
  Correction: the NPDES associated with the ocean outfall is an individual wastewater permit.

- Table 1.5.1-1, page 1-25, Section 402 of CWA.
  Update: The project will require NPDES 1200C stormwater permits for the LNG facilities, pipeline, APCO dredge spoils site, Kentuck Slough mitigation site, Trans-Pacific Parkway/U.S. 101 intersection widening, Malin Compressor construction elements.

- Page 4-85, Section 4.3.2.1 Jordan Cove LNG Project, Impact and Mitigation, second paragraph: "Wastewater generated during construction and operation of the Jordan Cove LNG Project would be treated by the City of North Bend's wastewater treatment system via a new industrial wastewater sewer line, and therefore the Project is not likely to add fecal coliform to Coos Bay."
  Correction: Wastewater generated during construction and operation of the Jordan Cove LNG project will be treated by a wastewater treatment facility located on the North Spit.

- Page 4-97, Section 4.3.2.2 Pacific Connector Pipeline Project, Oregon Water Quality Regulations and Standards, third paragraph.
  Update: ODEQ and EPA approved a temperature TMDL for Upper Klamath River, and Lost River subbasins on September 30, 2019. This Project will need to comply with the temperature TMDL.

- Page 4-147, Section 4.3.4.2 Surface Water, Stream Temperature Assessment, fourth paragraph: "Where TMDL thermal load allocations have not yet been established, ODEQ's 401 Water Quality Certification would require the development of a Water Protection Plan, consistent with the source specific implementation plan, and a mitigation plan to address project impacts on thermal loading."
  Correction: ODEQ will require the same mitigation ratios of 1:1 for construction phase impacts or 2:1 for permanent impacts on areas that do not have TMDL thermal load allocations.

- Page 4-836, Section 4.14.1.2 Water Resources and Wetlands, paragraph 4: "Preliminary analyses of the channel modification predict that construction and maintenance activities would have short-term turbidity effects but would meet ODEQ turbidity standards, have a small effect on salinity near the Project (-0.1 percent to +1.5 percent change in mean

salinity), and some decrease in dissolved oxygen (Port of Coos Bay and COE 2019 [unpublished])"
Comment: ODEQ cannot confirm that the Coos Bay, Oregon Section 408/204(f) Channel Modification project will meet ODEQ water quality standards or evaluate the accumulate impacts of Jordan Cove and Channel Modification projects. ODEQ has not received a 401 certification application for required Corps' authorizations associated with this aspect of the Project since ODEQ's denial of 401 certification in May of 2019, and ODEQ has not to-date received an application for 401 certification for FERC authorizations associated with the Project. ODEQ does not have access to the unpublished Port of Coos Bay and COE 2019 documents.

Sincerely,

Richard Whitman
Director

Attachments (2)

cc: Mike Koski, Jordan Cove LNG
Keith Andersen, ODEQ Western Region Administrator

Jordan Cove LNG SM
A Pembina Company

Jordan Cove LNG LLC
5615 Kirby Drive, Suite 500
Houston, TX 77005
T (713) 400-2800

www.jordancovelng.com

December 7, 2018

VIA ELECTRONIC MAIL AND US MAIL

Department of Environmental Quality
ERT Coordinator – Mary Camarata
165 East 7th Avenue, Suite 100
Eugene, Oregon 97401

RE: Jordan Cove Energy Project L.P. and Pacific Connector Gas Pipeline, LP
Section 401 Water Quality Certification

Dear Mary:

On September 21, 2017, Jordan Cove Energy Project L.P. ("JCEP") filed an application pursuant to Section 3(a) of the Natural Gas Act, as amended,[1] and Parts 153 and 380 of the regulations of the Federal Energy Regulatory Commission ("FERC" or "Commission"),[2] for authorization to site, construct, and operate certain liquefied natural gas facilities ("LNG Terminal"). On the same day, Pacific Connector Gas Pipeline, LP ("PCGP", and together with JCEP, "Jordan Cove") filed an application pursuant to Section 7(c) of the NGA,[3] and Parts 157 and 284 of the Commission's regulations,[4] for a certificate of public convenience and necessity authorizing PCGP to construct, install, own, and operate a new natural gas pipeline ("Pipeline") (The LNG Terminal and the Pipeline are together referred to as the "Jordan Cove Project".) In addition, Jordan Cove has filed applications with the U.S. Army Corps of Engineers for authorization under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

On October 22, 2017, Jordan Cove submitted a Section 401 Water Quality Certification application for the above-referenced Jordan Cove Project to the Oregon Department of Environmental Quality (ODEQ) for review. Supplemental application materials were provided to ODEQ on February 6, 2018 and May 21, 2018. On September 25, 2018, Jordan Cove sent a letter to ODEQ withdrawing its request for certification under Section 401 and simultaneously resubmitting its request as of that date. Therefore ODEQ now has until September 25, 2019 to act on Jordan Cove's request for certification.

During our meeting on November 14, 2018, a question was raised regarding whether Jordan Cove's prior submittals constituted separate requests for certification or a single request. By this

[1] 15 U.S.C. § 717b(a) (2012).
[2] 18 C.F.R. Pts. 153 and 380 (2018).
[3] 15 U.S.C. § 717f.
[4] 18 C.F.R. Pts. 157 and 284.

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letter, we confirm that Jordan Cove's prior submittals constitute a single request for certification, with the information submitted in February and May supplementing the original October 22, 2017 request. We also briefly discussed FERC's schedule for issuance of the draft environmental impact statement and final environmental impact statement and are attaching for your information a copy of the schedule FERC issued for the Jordan Cove Project.

Should you have any questions or require any further information, please contact me.

Regards,

Natalie Eades

Natalie Eades
Manager, Environment

Attachment

cc: Dave Belyea
Anika Marriott
Steve Mrazik
Keith Andersen
Mike Koski
Derik Vowels

20180831-3074 FERC PDF (Unofficial) 08/31/2018

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Pacific Connector Gas Pipeline LP	Docket Nos. CP17-494-000
Jordan Cove Energy Project L.P.	CP17-495-000

NOTICE OF SCHEDULE FOR ENVIRONMENTAL REVIEW PACIFIC CONNECTOR PIPELINE PROJECT AND JORDAN COVE ENERGY PROJECT

(August 31, 2018)

On September 21, 2017, Pacific Connector Gas Pipeline LP (Pacific Connector) and Jordan Cove Energy Project L.P. (Jordan Cove) filed applications in Docket Nos. CP17-494-000 and CP17-495-000, respectively. Pacific Connector is requesting a Certificate of Public Convenience and Necessity pursuant to Section 7(c) of the Natural Gas Act (NGA) to construct, operate, and maintain certain natural gas pipeline facilities. Jordan Cove is requesting authorization pursuant to Section 3(a) of the NGA to construct and operate liquefied natural gas (LNG) export facilities. The proposed projects are collectively referred to as the Jordan Cove LNG Project (Project). Jordan Cove's LNG facilities would be designed to liquefy about 7.8 million metric tons of natural gas per annum for export to markets across the Pacific Rim. On August 20, 2015, in Order No. 3698, the U.S. Department of Energy, Office of Fossil Energy, granted to Jordon Cove a long-term, multi-contract authorization to export LNG to Free Trade Agreement nations.

On October 5, 2017, the Federal Energy Regulatory Commission (FERC or Commission) issued a Notice of Applications for the Projects. Among other things, that notice alerted other agencies issuing federal authorizations of the requirement to complete all necessary reviews and to reach a final decision on the request for a federal authorization within 90 days of the date of issuance of the Commission staff's final Environmental Impact Statement (EIS) for the Projects. This instant notice identifies the FERC staff's planned schedule for completion of the final EIS for the Projects, which is based on an issuance of the draft EIS in February 2019. The forecasted schedule for both the draft and final EIS is based upon Jordon Cove and Pacific Connector providing complete and timely responses to any future data requests. In addition, the schedule assumes that the cooperating agencies will provide input on their areas of responsibility on a timely basis.

Schedule for Environmental Review

Issuance of Notice of Availability of the final EIS	August 30, 2019
90-day Federal Authorization Decision Deadline	November 28, 2019

20180831-3074 FERC PDF (Unofficial) 08/31/2018

Additional Information

In order to receive notification of the issuance of the EIS and to keep track of all formal issuances and submittals in specific dockets, the Commission offers a free service called eSubscription. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to www.ferc.gov/docs-filing/esubscription.asp.

Additional information about the Project is available from the Commission's Office of External Affairs at (866) 208-FERC or on the FERC website (www.ferc.gov). Using the "eLibrary" link, select "General Search" from the eLibrary menu, enter the selected date range and "Docket Number" excluding the last three digits (i.e., CP17-494 and/or CP17-495), and follow the instructions. For assistance with access to eLibrary, the helpline can be reached at (866) 208-3676, TTY (202) 502-8659, or at FERCOnlineSupport@ferc.gov. The eLibrary link on the FERC website also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rule makings.

Nathaniel J. Davis, Sr.,
Deputy Secretary.

DAVID EVANS
AND ASSOCIATES INC.

February 6, 2018

Mary Camarata
Department of Environmental Quality (DEQ)
Western Region - Eugene
165 East 7th Avenue, Suite 100
Eugene, OR 97401-3049

SUBJECT: Jordan Cove Energy Project / Pacific Connector Gas Pipeline - 401 Water Quality Package (NWP-2017/41)

Dear Ms. Camarata,

Jordan Cove LNG, LLC hereby submits a combined electronic Section 401Water Quality Package to DEQ for the Jordan Cove Energy Project (JCEP) and Pacific Connector Gas Pipeline (PCGP) projects. This package is a supplement to the Section 404/10 permit application provided to the U.S. Army Corps of Engineers (USACE) on October 23, 2017.

The two projects are interconnected and will be developed under the same ownership but will be designed and constructed under separate contracts. Per discussions with DEQ at the pre-application meeting and subsequent conversations, the two projects have been combined into a single application as it pertains to the 401 Water Quality Certification permit with two parts: (1) JCEP and (2) PCGP.

This package contains new documents as well as previously submitted documents to provide a stand-alone submittal for the convenience of public and agency review.

Part 1: JCEP 401 Package – The following documents are new to the public record and where applicable replace previous submittals.

- 401 Water Quality Memorandum
- Appendix A: Table 2, Project Activities with the Potential to Impact Water Quality
- Appendix B: Spill Prevention, Control, and Countermeasure Plan – Construction
- Appendix C: Erosion and Sediment Control Plan
- Appendix D: Storm Water Management Plan
- Appendix E: Hydrodynamic Analysis Technical Memorandum
- Appendix F: Impacts to Salinity Technical Memorandum
- Appendix G: Turbidity Analysis Technical Memorandum
- Appendix H: Sediment Transport Analysis Technical Memorandum
- Appendix I: Propeller Wash Analysis Technical Memorandum
- Appendix J: Vessel Wake Impacts Technical Memorandum
- Appendix K: Spill Prevention, Control, and Countermeasure Plan – Operations
- Appendix L: LNG Cooling Water Discharge Analysis Technical Memorandum

The remaining items were submitted to USACE and the Federal Energy Regulatory Commission (FERC) in 2017:

- Attachment A: Figures from JCEP Section 404 Permit Application
- Attachment B: Figure from JCEP Resource Report 1
- Appendix M: JCEP Section 404 Permit Application, Part 1 – October 2017
- Appendix N: Section 404-10 Permit Application, Responses to USACE Data Requests

Part 2: PCGP 401 Package – The Plan of Development water quality related documents, provided in Appendix E, have been submitted as part of the Right-of-Way Grant application to the BLM, U.S. Forest Service, and Bureau of Reclamation.

All other documents related to PCGP below were previously submitted to USACE and FERC in 2017.

- Appendix A - 401 Water Quality Summary Table – Attachment G from Part 2 of 404 Application for PCGP
- Appendix B – PCGP Section 404 Joint Permit Application, Part 2 – October 2017
- Appendix C - FERC Resource Report 6
- Appendix D - PCGP Wetland Delineation Report

Please call me should you have any questions regarding the enclosed application materials. I can be reached at (503) 223-6663 and via email at derik.vowels@deainc.com. Thank you for your involvement and feedback thus far, and we look forward to continuing our collaborative approach in securing the permit authorizations for the JCEP and PCGP projects.

Sincerely,

DAVID EVANS AND ASSOCIATES, INC.



Derik Vowels
Project Manager / Regulatory Specialist

Copies: Tyler Krug – USACE; Caroline Burda - JCLNG

DAVID EVANS AND ASSOCIATES INC.

October 23, 2017

Tyler Krug, Regulatory Project Manager
North Bend Field Office, Portland District
United States Army Corps of Engineers
2201 N. Broadway Suite C
North Bend, Oregon 97459

SUBJECT: Jordan Cove Energy Project Section 404/10 Permit Application, NWP-2017-41

Dear Mr. Krug:

Jordan Cove LNG, LLC hereby submit a combined Section 404/10 permit applications to your office for their Jordan Cover Energy Project (JCEP) and Pacific Connector Gas Pipeline (PCGP) projects. The two projects are interconnected and will be developed under the same ownership but will be designed and constructed contractually separate. Per discussions with USACE at the pre-application and subsequent conversations, the two projects have been combined into a single application for the Section 404/10 permit with two parts (1) JCEP and (2) PCGP. As such, separate Joint Permit Application forms have been completed for each part but under one cover as outlined below.

1. **Appointments of Authorized Agent** – Jordan Cove LNG, LLC is the authorized agent for the purpose of Section 404/10 permitting.

2. **Part 1: JCEP 404/10 Application** – This document contains the JPA Form prepared for the JCEP portion of the project. Block 1 contains information specific to JCEP. Blocks 2 through 13 provide information specific to the LNG Terminal component and, as applicable, reference Tables 4-2 and 6-1; Figures 1.1, 1.2, 4.1 and 6.1; and Attachments A through K for additional detail.

3. **Part 2: PCGP 404/10 Application –** This document contains the JPA Form prepared for the PCGP portion of the project. Block 1 contains information specific to PCGP. Blocks 2 through 13 provide detailed information for the Pipeline component and, as applicable, reference Tables 1, A.8-1, and B-3.4; Figures; and Attachments A through J for additional detail.

The following information will be provided under separate cover:

- Land Use Compatibility Statements (LUCS)
- Biological Assessment (led by FERC)
- Updated Alternatives Analysis
- Section 408 Permit Application
- Section 106 Cultural Resources Consultation (led by FERC)
- Environmental Alignment Sheets for Pipeline
- PCGP Wetland Delineation Reports
- Bulk Upload Template for JCEP and PCGP
- Compensatory Wetland Mitigation Plan

For context, the JCEP and PCGP project filed for a FERC application in September 2017 and can be referenced under FERC Docket numbers CP17-495-000 and CP17-494-000 respectively.

Please feel free to call me if you have any questions regarding the enclosed application materials. I can be reached at (503) 223-6663 and via email at derik.vowels@deainc.com. Thank you for your involvement and feedback thus far, and we look forward to continuing our collaborative approach in securing the permit authorizations for the JCEP and PCGP projects.

Sincerely,

DAVID EVANS AND ASSOCIATES, INC.



Deputy Project Manager / Regulatory Specialist

Joint Permit Application

This is a joint application, and must be sent to both agencies, who administer separate permit programs. Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

Date Stamp

U.S. Army Corps of Engineers Portland District	Oregon Department of State Lands
Corps Action ID Number	DSL Number

(1) APPLICANT AND LANDOWNER CONTACT INFORMATION

	Applicant	Property Owner (if different)	Authorized Agent (if applicable) ☑ ☐
Contact Name	Caroline Burda		Attn: Derik Vowels
Business Name	Jordan Cove LNG, LLC	Fort Chicago Holdings II, LLC 125 Central Avenue, Suite 380 Coos Bay, OR 97420	David Evans and Associates, Inc.
Mailing Address 1	5615 Kirby, Suite 500		2100 SW River Parkway
Mailing Address 2		APCO Coos Properties, LLC. PO Box 300	
City, State, Zip	Houston, TX 77005	Coos Bay, OR 97420	Portland, OR 97201
Business Phone	713-400-2800		503-223-6663
Cell Phone			
Fax			
Email	caroline.burda@jordancovelng.com		derik.vowels@deainc.com

(2) PROJECT INFORMATION

A. Provide the project location.

Project Name	Tax Lot #	Latitude & Longitude*
Jordan Cove Energy Project	See Figures 1.2-1 to 1.2-9	Latitude: 43.425346 (approximate) Longitude: 124.16767 (approximate)
Project Address / Location South of Trans Pacific Parkway; West of US Highway 101.	City (nearest) North Bend	County Coos

Township	Range	Section	Quarter/Quarter
25S	13W	Various	Various

Brief Directions to the Site
See Figure 1.1

B. What types of waterbodies or wetlands are present in your project area? (Check all that apply.)

☐	☑	☐
☑	☐	☐

(2) PROJECT INFORMATION

Waterbody or Wetland Name**	River Mile	6th Field HUC Name	6th Field HUC (12 digits)
Coos Bay	7.3		

C. Indicate the project category. (Check all that apply.)

☐	☑	☐
☐	☐	☐
☑	☐	☐
☑	☐	☐
☑	☐	☐

* In decimal format (e.g., 44.9399, -123.0283)
** If there is no official name for the wetland or waterway, create a unique name (such as "Wetland 1" or "Tributary A").

(3) PROJECT PURPOSE AND NEED

Provide a statement of the purpose and need for the overall project.

The Project is a market-driven response to the burgeoning and abundant natural gas supply in the US Rocky Mountain and Western Canada markets, and the growth of international demand, particularly in Asia.

The overall Project purpose and need is to construct a natural gas liquefaction and deep-water export terminal capable of receiving and loading ocean-going LNG carriers, in order to export natural gas derived from a point near the intersections of the GTN Pipeline system and Ruby Pipeline system.

The Pipeline receipt point near the intersection of the GTN Pipeline system and Ruby Pipeline system is strategically located to give reliable and secure supplies of natural gas from two natural gas supply basins – one in the U.S. Rocky Mountains (through the existing Ruby Pipeline) and a second in western Canada (through the existing GTN Pipeline) – capable of delivering volumes of at least 1,200,000 Dth/d in order to support export of 7.8 mtpa of LNG.

PCGP held an open season for transportation service on the Pipeline in July of 2017. PCGP has executed precedent agreements totaling 96% of the Pipeline's capacity.

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

A. Describe the existing physical and biological characteristics of each wetland or waterway. Reference the wetland and waters delineation report if one is available. Include the list of items provided in the instructions.

1. INTRODUCTION

For the sake of providing clarity, this introduction includes a limited summary of project-specific nomenclature used throughout this application. Project components are described in detail in Section 6 (Attachment A) of this Joint Permit Application (JPA).

Jordan Cove Energy Project, LP ("JCEP") – project proponent to construct the LNG Terminal.

Pacific Connector Gas Pipeline, LP ("PCGP") – project proponent to construct the natural gas transmission pipeline (the "Pipeline").

LNG Terminal – the Liquefied Natural Gas ("LNG") Terminal is composed of Ingram Yard, the Access and Utility Corridor, and the South Dunes site. The LNG Terminal includes all building infrastructure, machinery, utilities, and other project components associated with the receipt, liquefaction, storage, and loading of LNG onto ocean-going LNG carriers for export.

JCEP Project Area – the limits of disturbance associated with all permanent and temporary impacts resulting from construction of the LNG Terminal, including temporary construction sites and mitigation sites.

JCEP Project Vicinity – the JCEP Project Area and the general area beyond, as shown in Figure 1.1.

Ingram Yard – the portion of the LNG Terminal site that will house permanent LNG Terminal facilities, including LNG tanks and liquefaction equipment

Access Channel – the in-water area to be dredged that will provide LNG vessel access from the Federal Navigation Channel ("FNC") to the marine slip. The area will also include a material off-loading facility ("MOF") and temporary materials barge berth.

Access and Utility Corridor – a corridor connecting Ingram Yard and the South Dunes site, which will provide temporary construction and permanent access roads and facilities, and will include the Fire Department Facility, underground utilities, and gas feed to the LNG Terminal.

South Dunes Site - the portion of the LNG Terminal site that will house temporary construction and permanent facilities including a Workforce Housing Facility, metering station, administrative building, and the Southwest Oregon Regional Safety Center ("SORSC"), which will provide emergency response services for the facility and the southern Oregon region.

Trans Pacific Parkway and U.S. Highway 101 ("US-101") Intersection Widening – the asymmetrical widening of Trans Pacific Parkway to the north and US-101 to the west to provide safe ingress/egress for construction traffic, by creating a left-turn lane from Trans Pacific Parkway onto northbound US-101, and a right-turn lane from US-101 onto Trans Pacific Parkway.

APCO Sites 1 and 2 – two vacant sites on North Point, separated by a mudflat, that will be used for dredge material disposal and construction material laydown.

Temporary Construction Sites – additional sites outside of the immediate project construction footprint, which will provide space for construction staging, temporary equipment laydown, and employee park & rides. These areas include the Port Laydown site, Roseburg, Boxcar Hill, Myrtlewood and Ride and Mill Casino Park and Rides and APCO Site.

Meteorological Station - a permanent facility consisting of a tower located on the west side of the lagoon on the North Spit, used to measure wind speed, direction, and other weather data to provide weather information to the LNG Terminal facility and to support ship navigation.

Kentuck Project Site – approximately 100-acre proposed mitigation and habitat restoration site associated with the LNG Terminal and the Pipeline

Eelgrass Mitigation Site – approximately 9.3-acre proposed mitigation site for unavoidable eelgrass impacts associated with dredging of the access channel.

HMT – for the purpose of Clean Water Act (CWA) compliance, federal jurisdiction extends to the High Tide Line (HTL) in tidal waters. For the purpose of Oregon State Removal-Fill Act compliance, state jurisdiction extends to Highest Measured Tide (HMT). JCEP has received concurrence from DSL establishing HMT at elevation 10.26 feet North American Vertical Datum of 1988 ("NAVD 88"). To simplify impact calculations and accounting, and to minimize potential confusion arising from slightly different jurisdictional boundaries, JCEP has chosen to measure impacts in tidal waters up to the higher, more conservative HMT for both federal and state purposes.

2. WETLANDS

Historically, wetlands in the JCEP Project vicinity consisted of interdunal freshwater wetlands and tidal salt marsh. However, considerable development and land alteration have occurred in much of the proposed JCEP Project Area over the past century or so. Current-day freshwater wetlands being impacted by the proposed LNG Terminal consist of a combination of remnant wetlands surrounded by adjacent fill material and new wetlands that formed on top of fill.

Wetland delineations were conducted throughout the JCEP Project Area in February and March of 2013 and in June and December of 2016. Additional wetland delineations were conducted at the temporary construction sites during 2017.

Table 4.1, below, summarizes the wetland delineations conducted within the JCEP Project Area and Preliminary Jurisdictional Determinations ("JDs") received from the U.S. Army Corps of Engineers

("USACE") to date. The Preliminary JDs received to date are provided in Attachments C.1 to C.3. The wetland delineation reports and wetland determination technical memos detailing the location, hydrology, and dominant vegetation species for wetlands throughout the JCEP Project Area are provided in Attachment C.5 to C.8 where JDs have not yet been granted. Since it's been multiple years since some of the JDs have been issued, new or revised JDs are being requested for wetlands as outlined in the technical memo provided in Attachment C.9. Figures 4.1-1 to 4.1-7 show delineated wetlands within the JCEP Project Vicinity. Wetland impact quantities are provided in the Bulk Upload Template, Table 4-2. Functional assessments of these wetlands are included in the Compensatory Wetland Mitigation Plan (Attachment J). Wetlands throughout the various portions of the JCEP Project Area are summarized in the following section.

Ingram Yard

Tidal wetlands are generally lacking at the slip location and nearby shoreline; however, they occur within the Henderson Property located to the west of Ingram Yard. Tidal wetlands to be impacted by the Project at Ingram Yard consist of limited areas of salt marsh that transition to a relatively narrow bench of intertidal and shallow subtidal mudflat that drops off abruptly where it meets the FNC. The hydrogeomorphic ("HGM") class of wetlands to be impacted is "estuarine fringe," which extends down to a depth of 2 meters (6.6 feet) or approximately mean daily lower tide. No HGM class is provided for resources below the 2-meter depth. Cowardin classes of site resources include estuarine, intertidal, unconsolidated shore, regularly flooded (E2USN), and estuarine, subtidal, unconsolidated bottom, subtidal (E1UBL).

Most of the freshwater wetlands on upland areas of Ingram Yard are of the depressional HGM class, with hydrology primarily driven by the regional groundwater table. Based on the Cowardin classification system, these wetlands are the following classes: PEMA (palustrine emergent), PEMF (palustrine forested), and PSS and PSSC (palustrine scrub-shrub). Vegetation types include forested, scrub-shrub, and herbaceous communities. Plant communities are dominated by native species, with varying amounts of non-native species present.

Access and Utility Corridor

Freshwater emergent wetlands identified within the Access and Utility Corridor are characterized as Cowardin class PSSC, PFOC, and PEMF. Similar to the wetlands at Ingram Yard, the HGM class of these wetlands is depressional, with hydrology primarily driven by the regional groundwater table. Vegetation consists of forested, scrub-shrub, and herbaceous plant communities.

South Dunes Site

Tidal wetlands at the South Dunes site are located along the eastern and western shoreline of Jordan Cove (the water body) and at the southeastern tip of the South Dunes site. Wetlands adjacent to Jordan Cove are classified as estuarine intertidal emergent (i.e., salt marsh) based on the Cowardin system. These features are classified as estuarine wetlands based on the HGM system. Wetlands on the southeastern tip of the site consist of tidal marsh, as noted in the Wetlands J& H Technical Memo (Attachment C.10).

Freshwater wetlands in upland areas of the South Dunes site are classified as palustrine aquatic bed (PABH), palustrine emergent (PEM and PEMA), and palustrine scrub-shrub (PSS). These features are classified as depressional based on the HGM system, and hydrology is primarily driven by the regional groundwater table. Vegetation is characterized by scrub-shrub and herbaceous communities, and the presence of non-native and invasive species varies by wetland. As detailed in Attachment C.4, wetlands F and G are regulated by Oregon Department of Environmental Quality ("DEQ") under National Pollutant Discharge Elimination System ("NPDES") Permit No. 101499 and Solid Waste Permit No. 1142, and therefore are not subject to regulation under Section 404, per 33 Code of Federal Regulations ("CFR") 328.3(a)(8). These water bodies were designed to be sludge ponds to provide waste treatment for a mill that formerly occupied the property.

APCO Sites 1 and 2

Tidal and freshwater wetlands at APCO Sites 1 and 2 mostly occur outside of the JCEP Project Area, and therefore are generally outside the wetland delineation study boundary for these sites. The source

of wetland hydrology at delineated wetlands is primarily a function of either tidal exchange with Coos Bay (in tidal wetlands) or precipitation (in freshwater wetlands).

Tidal wetlands between APCO Site 1 and APCO Site 2 are classified as estuarine intertidal emergent (i.e., salt marsh) based on the Cowardin system. These features would be classified as estuarine wetlands based on the HGM system. These wetlands transition to intertidal mudflats.

Freshwater wetlands on the west, north, and east sides of the sites are classified as palustrine scrub-shrub wetlands based on the Cowardin system and as slope wetlands based on the HGM system. These extend off-site and transition to tidal wetlands. Freshwater wetlands in upland, central portions of the site are characterized as palustrine scrub-shrub wetlands based on the Cowardin system and as depressional wetlands based on the HGM system.

A wetland survey performed in July 2017 along the north shore of APCO Site 2 confirmed that no wetlands are present within the proposed corridor where the temporary dredge line will be placed, see Attachment C.8.

Kentuck Project Site

Tidal wetlands which are located along the edge of Coos Bay adjacent to the Kentuck Project site include estuarine intertidal emergent wetlands (i.e., salt marsh) based on the Cowardin system. These features are classified as estuarine wetlands based on the HGM system.

Emergent wetlands at the Kentuck Project site primarily consist of non-native lawn grasses and invasive species, as a result of the site's prior use as a golf course. Some native species are present. Portions of the Kentuck Project site, south of Golf Course Lane, also contain forested wetlands. Hydrology for wetlands at the Kentuck Project site is driven by a seasonally high groundwater table. Wetlands at the Kentuck Project site are classified as PEM and PFO based on the Cowardin system and as slope/flats based on the HGM system.

Temporary Construction Sites and Meteorological Station

Wetland surveys have been conducted at the Boxcar Hill site, the Port Laydown site, Myrtlewood Offsite Park & Ride, the Meteorological Station and access road, and along Trans Pacific Parkway north of the LNG Terminal site. The status of subsequent wetland determination memos and delineation reports are summarized below in Table 4.1.

Wetlands delineated at the Boxcar Hill site are freshwater and classified as palustrine scrub-shrub/emergent (PSS/PEM) according to the Cowardin classification system, and as depressional according to the HGM system. Hydrology is driven by a high groundwater table associated with sandy soils. Vegetation is characterized by shrubs with an emergent understory.

Freshwater wetlands delineated at the Port Laydown site are characterized as palustrine scrub-shrub/emergent (PSS/PEM) according to the Cowardin classification system, and as depressional based on the HGM system. These wetlands are also dominated by shrub vegetation with an emergent understory. Hydrology is derived from groundwater as well as saturation from runoff. At the Myrtlewood Offsite Park & Ride, wetlands with emergent, scrub-shrub, and forested components are located outside the site, but no wetlands were found within the site boundaries.

At the Mill Casino parking and laydown area, a wetland delineation will be undertaken when JCEP obtains access to the site from its owner, the Coquille Indian Tribe Trust, to perform environmental surveys.

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

Table 4.1. Summary of Wetland Delineations and Jurisdictional Determinations as of 10/10/2017

USACE ID #	Prepared by	Report Title Description	Geographic Coverage	Jurisdictional Determination (JD)
NWP-2012-441	DEA*	Linerboard/Mill Site	Linerboard/Mill Site (South Dunes)	March 13, 2014 (Attachment C.1)
NWP-2012-441	SHN**	Jordan Cove Energy Project, March 2013	Roseburg Property, Trans Pacific Parkway west of causeway and at US-y 101 intersection, northern end of US-101 bridge over Coos Bay	March 13, 2014 (Attachment C.1)
NWP-2012-441	SHN	Jordan Cove Energy Project, March 2013 (Revised)	Roseburg Property, Trans Pacific Parkway west of causeway and at US-y 101 intersection, northern end of US-101 bridge over Coos Bay	March 13, 2014 (Attachment C.1)
NWP-2012-441	DEA	APCO Coos Properties, April 2013	APCO Sites 1 and 2	March 13, 2014 (Attachment C.1)
NWP-2012-441	DEA	APCO Coos Properties, May 2013 (revised)	APCO Sites 1 and 2	March 13, 2014 (Attachment C.1)
NWP-2012-441	DEA	Kentuck Slough Golf Course Wetland Delineation (2009) and Reissuance (2016)	Kentuck Mitigation Project Site	March 13, 2014 (Attachment C.1)
NWP-2012-441	DEA	Kentuck Mitigation Site Expanded Area	Kentuck Project site south of Golf Course Lane, including irrigation pond	October 28, 2014 (Attachment C.2)
NWP-2016-265	DEA	Boxcar Hill Delineation Report, February 2017	Boxcar Hill site temporary construction site	March 16, 2017 (Attachment C.3)
N/A	DEA	Port Stockpile Site Delineation Report	Port Stockpile Site (aka Port Laydown site)	Attachment C.5
N/A	DEA	Trans Pacific Parkway Lagoon to Boxcar Delineation Report	Trans Pacific Parkway north of LNG Terminal site	Attachment C.6
N/A	DEA	Myrtlewood Determination Memo	Myrtlewood Offsite Park & Ride	Attachment C.7
N/A	DEA	APCO Wetland Determination Memo	Temporary Dredge Line at APCO Site 2	Attachment C.8

***DEA = David Evans and Associates, Inc.**

****SHN = SHN Engineers and Geologists, Inc.**

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

3. MUDFLATS

Mudflat resources within the JCEP Project Area are described in the wetland delineation reports for the JCEP Project Area that are included in Attachments C.1 to C.8 and Figures 4.1-1 to 4.1-7. Quantities for impacts to mudflats are provided in the Bulk Upload Template (Table 4.2). Mudflats throughout the various portions of the JCEP Project Area are briefly summarized in the following section.

Ingram Yard

The JCEP Project Area will affect mudflats in the area of the proposed access channel. Mudflats adjacent to the proposed access channel consist of unvegetated sand to mud substrates in the shallowest intertidal areas, which are regularly inundated by brackish water and are influenced by tidal flux, resulting in cycles of saturation and exposure. These transition along a relatively narrow bench through shallow subtidal areas and vegetated shallows, before dropping off abruptly at the adjacent FNC. Plant life is not typically abundant along these intertidal mudflats and adjacent shallow subtidal areas.

South Dunes Site

The estuarine intertidal emergent wetlands along Jordan Cove transition into a larger expanse of sparsely vegetated and unvegetated mudflats within Jordan Cove. These areas would not be disturbed by activities associated with the Project.

Trans Pacific Parkway/US-101 Intersection Widening

The in-water work area associated with the Trans Pacific Parkway/US-101 Intersection Widening consists of intertidal mudflats characterized by mud and sand, with some limited algae growth. A portion of habitat below HMT includes riprap and roadway embankment. This area was part of the open estuarine environment of Coos Bay until it was built up by placement of fill material during construction of the roadways.

Kentuck Project Site

Vegetated and unvegetated intertidal mudflats exist on the estuary side of the dike separating the Kentuck Project site from Coos Bay.

4. VEGETATED SHALLOWS

Vegetated shallows within the JCEP Project Area are characterized by eelgrass that occurs throughout the lower bay, typically straddling the boundary between intertidal mudflats and shallow subtidal areas. Vegetated shallows occur at the proposed access channel. The eelgrass in this area tends to be less dense and in smaller patches than is found in the broader flats in the upper and lower bay. Areas of vegetated shallows also occur on the western and eastern sides of the entrance to Jordan Cove. A fringing band of eelgrass is located within vegetated shallows along the north side of APCO Sites 1 and 2. Eelgrass also occurs within the area surrounding the proposed Eelgrass Mitigation site. Additional areas of vegetated shallows exist within Coos Bay at the mouth of Kentuck Slough in the vicinity of the Temporary Dredge Transfer Line.

Vegetated shallows within the JCEP Project Area where a JD or concurrence has not been issued are described in the wetland delineation reports that are included as Attachments C.1 to C.8. Quantities for impacts to vegetated shallows are provided in the Bulk Upload Template (Table 4-2).

5. DEEP SUBTIDAL

A portion of the access channel and the entire footprint of the four areas to be dredged adjacent to the FNC for navigation reliability are located in deep subtidal habitat (i.e., below -15 MLLW). The substrate in these areas consists primarily of unvegetated sand and rock.

6. FLOODPLAINS

Portions of the JCEP Project Area lie within the 100-year floodplain. The areas of the JCEP Project Area lying within the 100-year floodplain are summarized below and detailed in Figure 4.1-8.

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

Ingram Yard and South Dunes Site

According to Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Maps ("FIRMs") 41011C0167E and 41011C0186E, effective March 17, 2014, the majority of the LNG Terminal site is located within FEMA Flood Hazard Zone X, which denotes areas of minimal flood hazard. Portions of the South Dunes site adjacent to Jordan Cove are located in Flood Hazard Zone AE, elevation 12 feet, which represents areas that are subject to the 1 percent annual chance flood (100-year flood, or base flood) where the 12-foot base flood elevation is the water-surface elevation of the 1 percent annual chance flood. The area at the southern tip of the South Dunes site and the easternmost portion of the South Dunes site abutting Haynes Inlet to the east of the railroad right-of-way are also located in Flood Hazard Zone AE, base elevation 12 feet.

APCO Sites 1 and 2

According to FEMA FIRM Panel 41011C0186E, effective March 17, 2014, the upland portions of the fill pads at APCO Site 1 and APCO Site 2, where most of the disturbance associated with the JCEP Project Area would occur, are located outside of the 100-year floodplain. The intertidal mudflat between APCO Site 1 and APCO Site 2, where a temporary construction bridge will be placed, is in Zone AE, base flood elevation 12 feet. The area along the northern and western shoreline of APCO 2 is in Zone AE, base flood elevation 12 feet. The area of APCO Site 1 at the foot of the railroad bridge is in Zone AE, base flood elevation 12 feet, and is an "area of undetermined flood hazard."

Kentuck Project Site

Based on FEMA FIRM Panels 41011CO187E and 41011CO195E, effective March 17, 2014, nearly the entire Kentuck Project site is located within Flood Hazard Zone AE, base flood elevation 12 feet. Small upland areas along the southern and eastern boundaries of the Kentuck Project site are outside of the 100-year floodplain.

Temporary Construction Sites

According to FIRM Panel 41011C0180E, effective March 17, 2014, the entire Myrtlewood Offsite Park & Ride and most of the work area below the road bed at the Trans Pacific Parkway/US-101 Intersection Widening are located within Flood Hazard Zone AE, base flood elevation 12 feet. Roughly half of the Mill Casino Offsite Park & Ride is located in Flood Hazard Zone AE, base flood elevation 13 feet, per FIRM Panel 41011C0189E. The Boxcar Hill, Port Laydown, and Meteorological Station sites are outside of the 100-year floodplain.

7. FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

As indicated in Box 7 below, three federally listed anadromous fish species are known to be present within the estuarine environment of Coos Bay, and they use various habitats within the bay for portions of their life cycle. Oregon Coast coho salmon, southern Distinct Population Segment ("DPS") green sturgeon, and southern DPS Pacific eulachon were federally listed as threatened under the Endangered Species Act ("ESA") in 2008, 2006, and 2010, respectively. Critical habitat was designated within Coos Bay for coho salmon in February 2008 and for southern DPS green sturgeon in October 2009. Section 7 consultation will be undertaken with the National Marine Fisheries Service ("NMFS"). A biological assessment ("BA") will be prepared by FERC following completion of an Applicant Prepared BA in the fourth quarter of 2017.

8. CULTURAL RESOURCES

A cultural resources report has been submitted to FERC as part of JCEP's application to FERC under Section 3 of the Natural Gas Act. The application was filed on 9/21/2017. Under the National Historic Preservation Act ("NHPA"), FERC is responsible for initiating consultation under Section 106 of the NHPA.

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

B. Describe the existing navigation, fishing and recreational use of the waterway or wetland.

1. NAVIGATION

Coos Bay is the second largest estuary in Oregon and is used by deep-draft commercial ships and barges, a commercial fishing fleet, and recreational boats. The FNC adjacent to the LNG Terminal site, which is maintained by USACE, is generally 300 feet wide and currently has a navigational depth of -37 Mean Lower Low Water ("MLLW"). Annual commercial ship traffic into and out of the Oregon International Port of Coos Bay (the "Port") has declined in recent years from a high of 310 deep-draft vessel calls at the Port in 1988 to 52 in 2016. The Port is also visited, by conservative estimates, by 50 tug/barge units per year, with 14 tug/barge units requesting pilotage during 2016 as per data from the Coos Bay Pilots Association.

2. FISHING

Commercial fisheries within the Coos Bay estuary include clams, bait fish, and ghost and mud shrimp (used for fishing bait), along with crabbing from September through December. There are no commercial fisheries for vertebrate fish species in any of the estuarine or freshwater habitats of Coos Bay. Commercial ocean fisheries include boats (trollers and trawlers) targeting albacore tuna, sablefish, salmon, groundfish, Dungeness crab, clams, and pink shrimp. Oregon Department of Fish and Wildlife (ODFW) data on pounds and values of commercially caught fish and shellfish landed in Charleston, Oregon in 2016 indicate that shellfish fisheries (predominantly crab, shrimp, and clams) are of substantial economic importance to the Coos Bay area, exceeding $18.8 million in value in 2016.

3. RECREATION

The primary recreational activities taking place within the Coos Bay estuary include boating, fishing, waterfowl hunting, bird watching, clamming, and crabbing. Recreational boating takes place throughout Coos Bay, although most originates primarily near the towns of Charleston and Empire, where there are boat ramps. There is also a marina complex in Charleston. In addition to the Charleston boat ramp (approximately 13.25 miles from the LNG Terminal site) and Empire boat ramp (approximately 4.75 miles from the LNG Terminal site), recreational boaters operating within the JCEP Project Area vicinity use the BLM North Spit boat ramp (approximately 0.75 mile from the LNG Terminal site) to access the bay. A system of water trails for canoeists and kayakers exists throughout the sloughs and rivers draining into the bay. The water trails closest to the LNG Terminal site are approximately 1 mile northeast in North Slough and Haynes Inlet east of the Central Oregon and Pacific Railroad Bridge crossing Coos Bay. Jordan Cove and the section of Coos Bay south of the LNG Terminal site are not part of the water trail system.

The main recreational catch species of fish in and around Coos Bay include coho and Chinook salmon. Other recreational catch species include American shad, shiner perch, redtail surf perch, striped sea perch, white sea perch, pile perch, black rockfish, lingcod, Cabezon, red Irish lord, Pacific staghorn sculpin, surf smelt, Pacific herring, Pacific tomcod, kelp and rock greenling, blue and cooper rockfish, halibut, and white sturgeon. Much of the recreational angling for salmon in Coos Bay occurs in late summer and fall, usually beginning in late summer at jetty areas and moving up the bay as fish move upstream. Recreational fishing for sturgeon occurs between the railroad bridge and the McCullough Bridge, and also above the McCullough Bridge. Recreational crabbing and clamming bring year-round tourist income to the region. Crabbing occurs in the main channel areas, largely from the Bureau of Land Management ("BLM") boat ramp on the North Spit (west of the JCEP Project Area) to the mouth of the bay, and typically is done around slack tides. The main areas for recreational clamming and crabbing in the bay are located along the west side of the South Slough near Charleston, along the North Spit; at Fossil and Pigeon points; near Haynes Inlet, North Slough, and Glasgow; and along the east side of the upper bay. The west shore of the bay at Jordan Cove contains sand/mudflats, eelgrass beds, and a fringe of salt marsh that provide habitat for recreationally important ghost shrimp and mud shrimp. These shrimp are recreationally harvested at a number of locations throughout the bay, and are popular among fishermen for use as bait.

(5) PROJECT SPECIFIC CRITERIA AND ALTERNATIVES ANALYSIS

Describe project-specific criteria necessary to achieve the project purpose. Describe alternative sites and project designs that were considered to avoid or minimize impacts to the waterway or wetland.

JCEP submitted Resource Report 10 to FERC in September 2017. Resource Report 10 details the reasonable alternatives to siting the JCEP Project Area at its current location in Coos Bay. The alternatives analysis will be supplemented to reflect comments received from USACE on August 21, 2017, as it pertains to the USACE 404(b)(1) guidelines for evaluating alternatives, and will be provided to USACE as Attachment B of this JPA at a later date.

(6) PROJECT DESCRIPTION

A. Briefly summarize the overall project including work in areas both in and outside of waters or wetlands..

B. Describe work within waters and wetlands

C. Construction Methods. Describe how the removal and/or fill activities will be accomplished to minimize impacts to waters and wetlands.

D. Describe source of fill material and disposal location if known

See Attachment A.1: Project Description – Section 6 Narrative for a discussion of the overall project, including work in areas both in and outside of waters or wetlands. A more detailed discussion of work outside of waters and wetlands is provided in Resource Report 1 issued to FERC in September 2017 (Attachment A.2).

A summary of activities which may impair water quality and subsequent plans or practices to manage potential impacts are summarized in Attachment G.

E. Construction timeline.

What is the estimated project start date? 1st half of 2019

What is the estimated project completion date? 1st half of 2024

Is any of the work underway or already complete? ☐ ☑

If yes, describe.

N/A

E. **Fill Volumes and Dimensions** (if more than 4 impact sites, include a summary table as an attachment)

See Table 4-2, Bulk Upload Template

Wetland / Waterbody Name *	Fill Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq.ft. or ac.)	Volume (c.y.)		

F. Total Fill Volumes and Dimensions

See Table 4-2, Bulk Upload Template			
Fill Impacts to Waters	**Length (ft.)**	**Area (sq. ft or ac.)**	**Volume (c.y.)**

(6) PROJECT DESCRIPTION

Total Fill to Wetlands			
Total Fill Below Ordinary High Water			
Total Fill Below Highest Measured Tide			
Total Fill Below High Tide Line			
Total Fill Below Mean High Water Tidal Elevation			

G. **Removal Volumes and Dimensions** (if more than 4 impact sites, include a summary table as an attachment)

See Table 4-2, Bulk Upload Template

Wetland / Waterbody Name*	Removal Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq. ft. or ac.)	Volume (c.y.)		

H. Total Removal Volumes and Dimensions

See Table 4-2, Bulk Upload Template; Table 6-2 Proposed Dredged Material Management for Construction Activities

Removal Impacts to Waters	Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)
Total Removal to Wetlands			
Total Removal Below Ordinary High Water			
Total Removal Below Highest Measured Tide			
Total Removal Below High Tide Line			
Total Removal Below Mean High Water Tidal Elevation			

* If there is no official name for the wetland or waterway, create a unique name (such as "Wetland 1" or "Tributary A").
** Indicate the days, months or years the fill or removal will remain. Enter "permanent" if applicable. For DSL, permanent removal or fill is defined as being in place for 24 months or longer.
*** Example: soil, gravel, wood, concrete, pilings, rock etc.

(7) ADDITIONAL INFORMATION

Are there any state or federally listed species on the project site?	☑	☐	☐
Is the project site within designated or proposed critical habitat?	☑	☐	☐
Is the project site within a national Wild and Scenic River?	☐	☑	☐
Is the project site within the 100-year floodplain?	☑	☐	☐

*** If yes to any of the above, explain in Block 4 and describe measures to minimize adverse effects to these resources in Block 5.**

Is the project site within the Territorial Sea Plan (TSP) Area?	☐	☑	☐

*** If yes, attach TSP review as a separate document for DSL.**

Is the project site within a designated Marine Reserve?	☐	☑	☐

*** If yes, certain additional DSL restrictions will apply.**

Will the overall project involve construction dewatering or ground disturbance of one acre or more?	☑	☐	☐

*** If yes, you may need a 1200-C permit from the Oregon Department of Environmental Quality (DEQ).**

Is the fill or dredged material a carrier of contaminants from on-site or off- site spills?	☐	☑	☐

(7) ADDITIONAL INFORMATION

Has the fill or dredged material been physically and/or chemically tested? ***If yes, explain in Block 4 and provide references to any physical/chemical testing report(s).**	☑	☐	☐
Has a cultural resource (archaeological) survey been performed on the project area? *** If yes, provide a copy of the survey with this application. Do not describe any resources in this document.**	☑	☐	☐

Identify any other federal agency that is funding, authorizing or implementing the project.

Agency Name	Contact Name	Phone Number	Most Recent Date of Contact
Federal Energy Regulatory Commission	John Peconom	(202) 502-6352	8/9/2017
National Marine Fisheries Service	Chuck Wheeler	(541) 957-3379	10/2/2017
US Coast Guard	LCDR Laura Springer	(503) 240- 2594	9/19/2017

List other certificates or approvals/denials required or received from other federal, state or local agencies for work described in this application. For example, certain activities that require a Corps permit also require 401 Water Quality Certification from Oregon DEQ.

Approving Agency	Certificate/ approval / denial description	Date Applied
DEQ	401 WQ Certification	TBD
US Army Corps of Engineers – Civil Works	408 Approval	TBD
National Marine Fisheries Service	ESA Authorization	TBD

Other DSL and/or Corps Actions Associated with this Site (Check all that apply.)

☐		
☑	DSL Waterway Lease #	
☑	Corps # NWP-2017-41/2	DSL # 60528
☐	Corps #	DSL #
☑	Corps # NWP-2012-441; NWP-2016-265	DSL #

☑
☑
☑

(8) IMPACTS, RESTORATION/REHABILITATION, COMPENSATORY MITIGATION

A. Describe unavoidable environmental impacts that are likely to result from the proposed project. Include permanent, temporary, direct, and indirect impacts.

See Table 4-2 for detail on the extent of unavoidable permanent impacts to wetlands and waters resulting from construction of the LNG Terminal.

Impacts to other environmental resources are detailed in Resource Report 2 and 3, issued to FERC on 9/21/17 (Attachment A.3 and A.4 respectively).

(8) IMPACTS, RESTORATION/REHABILITATION, COMPENSATORY MITIGATION

B. For temporary removal or fill or disturbance of vegetation in waterways, wetlands or riparian (i.e., streamside) areas, discuss how the site will be restored after construction.

During construction, a number of methods will be utilized to minimize the impacts of removal and fill on waterways and wetlands. Following completion of construction, areas of temporary disturbance to wetland and upland areas will be restored to pre-project conditions to the extent practicable. Methods used to minimize the temporary wetland and tidal waters impacts to the greatest extent practicable and avoid permanent wetland impacts are detailed in the Erosion and Sediment Control Plan (ESCP) (Attachment G) and Site Restoration Plan (Attachment I), and include the following.

1. Areas disturbed by construction of the Project facilities will be stabilized with temporary erosion controls until construction is complete, unless covered by equipment, gravel or other covering. Following construction, the site will be final graded, and BMPs will be applied to prevent erosion and associated impacts to wetlands and waterways.
2. While construction of permanent facilities at the LNG Terminal site is not anticipated beyond the toe of the fill slope, perimeter site preparation activities, installation and maintenance of erosion and sediment control measures and ground improvements adjacent to the toe of slope may cause settlement or temporary disturbances beyond the toe of slope.
3. Following excavation activities, all exposed areas, including exposed slopes, will be stabilized with an approved seed mixture specified as being capable of surviving in highly permeable, xeric regimes, binding loose sand, and withstanding burial and deflation from aeolian processes.
4. All work within the Coos Bay estuary, including construction of the MOF, dredging of the access channel and removal of the berm, and dredging associated with the navigation reliability improvements and eelgrass mitigation site, will be performed during the ODFW in water work window (October 1 to February 15).
5. Upon completion of dredging operations, any temporary in-water and upland facilities will be removed. Slurry and decant water pipelines will be removed, and any areas disturbed by these pipelines will be restored to pre-construction conditions.
6. The APCO 1 site and other permanent or long-term disposal sites will be stabilized using an approved seed mix to minimize windblown sand from being deposited on roads, upland habitats, and waterways.
7. At temporary construction sites, grades will be restored to pre-project conditions and the sites will be revegetated with an approved seed mixture.
8. Following compaction during ground improvements, the top 3 feet of affected wetland areas will be returned to original elevations and can be loosened or scarified to allow planting of vegetation. Soils will be amended as needed, and hydrophytic vegetation will be replanted.

Proposed conservation and mitigation actions that would be implemented as part of the Project to compensate for the loss of eelgrass and unvegetated mudflat habitat are expected to more than offset the losses incurred during Project construction. Mitigation details are provided in the Project Compensatory Wetland Mitigation Plan (Attachment J).

Compensatory Mitigation

C. Proposed mitigation approach. Check all that apply:

☑ ☑ ☐ ☐

(8) IMPACTS, RESTORATION/REHABILITATION, COMPENSATORY MITIGATION

D. Provide a brief description of mitigation approach and the rationale for choosing that approach. If you believe mitigation should not be required, explain why.

Mitigation for unavoidable impacts to Section 404-regulated resources is addressed in the Compensatory Wetland Mitigation Plan (CWMP), which describes the proposed Kentuck Project site and Eelgrass Mitigation Site (see Attachment J).

Mitigation Bank / In-Lieu Fee Information:

Name of mitigation bank or in-lieu fee project: N/A

Type of credits to be purchased: N/A

If you are proposing permittee-responsible mitigation, have you prepared a compensatory mitigation plan?

☑

☐

Mitigation Location Information (Fill out only if permittee-responsible mitigation is proposed)

Mitigation Site Name/Legal Description	Mitigation Site Address	Tax Lot #
Kentuck Mitigation Site; Eelgrass Mitigation Site	N/A	Kentuck - 25s12w06c lot 100, 25s13w12a lot 100, and 25s13w1d lot 400; Eelgrass - N/A
County Coos	City North Bend	Latitude & Longitude (in DD.DDDD format) varies

Township	Range	Section	Quarter/Quarter
25	Kentuck - 12 West, 13 west; Eelgrass: 13 West	Kentuck - 12W section 6 and 7; 13W section 1 and 2; Eelgrass: 13W Section 8	varies

(9) ADJACENT PROPERTY OWNERS FOR PROJECT AND MITIGATION SITE		
☐	**Project Site Adjacent Property Owners** See Attachment K	**Mitigation Site Adjacent Property Owners**

Contact Name
Address 1
Address 2
City, ST ZIP Code , ,

Contact Name
Address 1
Address 2
City, ST ZIP Code , ,

Contact Name
Address 1
Address 2
City, ST ZIP Code , ,

Contact Name
Address 1
Address 2
City, ST ZIP Code , ,

Contact Name
Address 1
Address 2
City, ST ZIP Code , ,

Contact Name
Address 1
Address 2
City, ST ZIP Code , ,

Contact Name
Address 1
Address 2
City, ST ZIP Code , ,

Contact Name
Address 1
Address 2
City, ST ZIP Code , ,

(10) CITY/COUNTY PLANNING DEPARTMENT LAND USE AFFIDAVIT (TO BE COMPLETED BY LOCAL PLANNING OFFICIAL)

I have reviewed the project described in this application and have determined that:

☐

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☐

☐

☐

An application ☐ ☐

Local planning official name (print)	Title	City / County (circle one)

Signature	Date

Comments:

(11) COASTAL ZONE CERTIFICATION

If the proposed activity described in your permit application is within the Oregon coastal zone, the following certification is required before your application can be processed. A public notice will be issued with the certification statement, which will be forwarded to the Oregon Department of Land Conservation and Development (DLCD) for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program, contact DLCD at 635 Capitol Street NE, Suite 150, Salem, Oregon 97301 or call 503-373-0050.

CERTIFICATION STATEMENT

I certify that, to the best of my knowledge and belief, the proposed activity described in this application complies with the approved Oregon Coastal Zone Management Program and will be completed in a manner consistent with the program.

Print /Type Name	Title

Signature	Date

(12) SIGNATURES

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and belief, this information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities. By signing this application I consent to allow Corps or DSL staff to enter into the above-described property to inspect the project location and to determine compliance with an authorization, if granted. I hereby authorize the person identified in the authorized agent block below to act in my behalf as my agent in the processing of this application and to furnish supplemental information in support of this permit application. I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. I understand that payment of the required state processing fee does not guarantee permit issuance.

To be considered complete, the fee must accompany the application to DSL. The fee is not required for submittal of an application to the Corps.

Fee Amount Enclosed	$

Applicant Signature	
Print Name	Title
Signature	Date

Authorized Agent Signature	
Print Name	Title
Signature	Date

Landowner Signature(s)

Landowner of the Project Site (if different from applicant)	
Print Name	Title
Signature	Date

Landowner of the Mitigation Site (if different from applicant)	
Print Name	Title
Signature	Date

Department of State Lands, Property Manager (to be completed by DSL)

If the project is located on state-owned submerged and submersible lands, DSL staff will obtain a signature from the Land Management Division of DSL. A signature by DSL for activities proposed on state-owned submerged/submersible lands only grants the applicant consent to apply for a removal-fill permit. A signature for activities on state-owned submerged and submersible lands grants no other authority, express or implied and a separate proprietary authorization may be required.

Print Name	Title
Signature	Date

(13) ATTACHMENTS

- [x]
  - [x]
  - [ ]
  - [x]
  - [x]
  - [x]
  - [x]
  - [ ]
  - [ ]
  - [x]
- [x]
- [x]
- [x]
- [x]
- [x]
- [ ]
- [ ]
- [x]
  - [x] Dredged Material Management Plan
  - [x] PSET Letters; Design Details

Send Completed form to:

U.S. Army Corps of Engineers
ATTN: CENWP-OD-GP
PO Box 2946
Portland, OR 97208-2946
Phone: 503-808-4373

Counties:
Baker, Clackamas, Clatsop, Columbia, Gilliam, Grant, Hood River, Jefferson, Lincoln, Malheur, Marion, Morrow, Multnomah, Polk, Sherman, Tillamook, Umatilla, Union, Wallowa, Wasco, Washington, Wheeler, Yamhill

OR

U.S. Army Corps of Engineers
ATTN: CENWP-OD-GE
211 E. 7th AVE, Suite 105
Eugene, OR 97401-2722
Phone: 541-465-6868

Counties:
Benton, Coos, Crook, Curry, Deschutes, Douglas Jackson, Josephine, Harney, Klamath, Lake, Lane, Linn

Send Completed form to:

DSL - West of the Cascades:

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
Phone: 503-986-5200

OR

DSL - East of the Cascades:

Department of State Lands
1645 NE Forbes Road, Suite 112
Bend, Oregon 97701
Phone: 541-388-6112

Send all Fees to:
Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
Pay by Credit Card by Calling 503-986-5253

Joint Permit Application

This is a joint application, and must be sent to both agencies, who administer separate permit programs. Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

Date Stamp

U.S. Army Corps of Engineers Portland District	Oregon Department of State Lands
Corps Action ID Number	DSL Number

(1) APPLICANT AND LANDOWNER CONTACT INFORMATION

	Applicant	Property Owner (if different)	Authorized Agent (if applicable) ☑ Consultant ☐ Contractor
Contact Name	Caroline Burda	Multiple – Pacific Connector Gas Pipeline, LP (PCGP) must obtain an easement prior to commencing construction. A list of landowners where wetlands/waterbodies would be affected by the Pipeline is provided in the 'Tables' section as Table 1.	Carolyn Last/Dan Duce
Business Name	Jordan Cove LNG, LLC Pacific Connector Gas Pipeline, LP		Edge Environmental, Inc.
Mailing Address 1	5615 Kirby Drive, Suite 500		405 Urban Street, Ste. 310
Mailing Address 2			
City, State, Zip	Houston, TX 77005		Lakewood, CO 80228
Business Phone	713-400-2813		303-988-8844
Cell Phone	832-242-8177		303-956-4289
Fax			303-988-8999
Email	Caroline.burda@jordancovelng.com		clast@edgeenvironmental.com

(2) PROJECT INFORMATION

A. Provide the project location.

Project Name	Tax Lot #	Latitude & Longitude*
Pacific Connector Gas Pipeline Project	See Table 1 in the 'Tables' section	MP 0.0=43.4325 -124.2402 MP 228.13=42.0335 -121.3753
Project Address / Location See maps in 'Figures' section. Also see Section 1.1.2.2 in Attachment A/Project Description.	City (nearest) Coos Bay, North Bend, Dillard, Myrtle Creek, Trail, Klamath Falls and Malin	County Coos, Douglas, Jackson, Klamath counties.

Township	Range	Section	Quarter/Quarter
See maps in 'Figures' section.			

Brief Directions to the Site

See maps in 'Figures' section and Environmental Alignment Sheets (provided under separate cover and on CD). The USGS-topographic location maps provide the proposed access roads. The proposed pipeline is 229 miles long. PCGP will provide directions to specific locations upon request.

B. What types of waterbodies or wetlands are present in your project area? (Check all that apply.)

☑ River / Stream	☑ Non-Tidal Wetland	☑ Lake / Reservoir / Pond
☑ Estuary or Tidal Wetland	☐ Other	☐ Pacific Ocean

(2) PROJECT INFORMATION

Waterbody or Wetland Name** See Tables A.2-2 and A.2-3 in Appendix A.2 to Attachment C/Affected Water Resources and the Wetland Delineation Report (provided under separate cover)	River Mile	6th Field HUC Name	6th Field HUC (12 digits)

C. Indicate the project category. (Check all that apply.)

☐ Commercial Development	☐ Industrial Development	☐ Residential Development
☐ Institutional Development	☐ Agricultural	☐ Recreational
☐ Transportation	☐ Restoration	☐ Bank Stabilization
☐ Dredging	☑ Utility lines natural gas	☐ Survey or Sampling
☐ In- or Over-Water Structure	☐ Maintenance	☐ Other:

* In decimal format (e.g., 44.9399, -123.0283)
** If there is no official name for the wetland or waterway, create a unique name (such as "Wetland 1" or "Tributary A").

(3) PROJECT PURPOSE AND NEED

Provide a statement of the purpose and need for the overall project.

The Project is a market-driven response to the burgeoning and abundant natural gas supply in the US Rocky Mountain and Western Canada markets, and the growth of international demand, particularly in Asia.

The overall Project purpose and need is to construct a natural gas liquefaction and deep-water export terminal capable of receiving and loading ocean-going LNG carriers, in order to export natural gas derived from a point near the intersections of the GTN Pipeline system and Ruby Pipeline system.

The Pipeline receipt point near the intersection of the GTN Pipeline system and Ruby Pipeline system is strategically located to give reliable and secure supplies of natural gas from two natural gas supply basins – one in the U.S. Rocky Mountains (through the existing Ruby Pipeline) and a second in western Canada (through the existing GTN Pipeline) – capable of delivering volumes of at least 1,200,000 Dth/d in order to support export of 7.8 mtpa of LNG.

PCGP held an open season for transportation service on the Pipeline in July of 2017. PCGP has executed precedent agreements totaling 96% of the Pipeline's capacity.

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

A. Describe the existing physical and biological characteristics of each wetland or waterway. Reference the wetland and waters delineation report if one is available. Include the list of items provided in the instructions.

The items listed in the instructions are included in the wetland delineation report, provided under separate cover. Summary information for all wetlands and waterbodies affected by the Pipeline is provided in Attachment C/Affected Water Resources (specifically Sections 2.2 and 2.3; Appendix A.2/Tables (A.2-2, A.2-3, A.2-7, A.2-8, A.2-9); and Appendix U.2/HGM Report).

The Pipeline will affect 346 waterbodies, 63 of which are not crossed by the centerline (31 streams, 10 ponds, 21 ditches, and 1 estuarine feature) but are within the right-of-way or temporary extra work areas. Of the 346 waterbodies, 66 are perennial, 168 are intermittent, 98 are ditches, 10 are lakes or stock ponds, and 4 are estuarine (Coos Bay/2 HDD crossings, the HDD pullback at MP 0.0, and the Coos River).

In Coos County, the Pipeline will cross 18 perennial and 22 intermittent waterbodies, 3 ditches, and the 4 estuarine features. In Douglas County, the Pipeline will cross 32 perennial and 45 intermittent waterbodies, 3 industrial ponds, and 10 ditches. In Jackson County, the Pipeline will cross 13 perennial and 63 intermittent waterbodies, 12 ditches and 3 lacustrine features or stock ponds. In Klamath County, the Pipeline will cross 3 perennial and 38 intermittent waterbodies, 73 ditches and 4 stock or industrial ponds.

Table 2.2-1 in Attachment C/Affected Water Resources describes the beneficial uses of the basins crossed by the Project. Table A.2-2 in Appendix A.2 to Attachment C provides a listing of all waterbodies crossed by the Pipeline and includes: 1) waterbody name; 2) milepost location (centerline of the waterbody); 3) waterbody identification

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

number; 4) NHD waterbody reach code, if available; 5) approximate stream width at the crossing location; 6) excavated volume at crossing; 7) proposed crossing method; 8) FERC classification; 9) Cowardin Classification; 10) stream flow type (perennial or intermittent); 11) ODF water quality classification/Northwest Forest Plan Designation; and 12) status of water quality limited streams. The Fish Utilization table (B.3-4) in the 'Tables' section includes the fish presence for each waterbody crossed by the Project.

Table A.2-3 in Appendix A.2 to Attachment C lists the milepost location, classification and the crossing length of the excavated trench (in feet) as well as construction-related disturbance (in acres) for each wetland that will be affected by construction. Table A.2-7 in Appendix A.2 in Attachment C provides a summary of wetland impacts by watershed (Fifth Field/HUC10) and Cowardin classification. The Pipeline will cross a total of approximately 30,777.58 feet (5.83 miles) of wetlands. The construction right-of-way and temporary extra work areas will affect 113.98 acres of wetlands, 109.61 acres of palustrine emergent wetlands, 1.43 acre of palustrine scrub-shrub wetlands and 2.30 acres of palustrine forested wetlands. Additionally, 0.64 acre of palustrine unconsolidated bottom or aquatic bed wetlands (predominantly stock ponds) will be disturbed by the Pipeline. Permanent wetland vegetation type conversion impacts have been quantified for each forested or scrub-shrub wetland where permanent maintenance of the Pipeline's operational corridor would convert the wetland to a different wetland type (see Table A.2-3 in Appendix A.2 to Attachment C). Permanent vegetation type conversion impacts will affect a total of 0.83 acre of wetlands, including 0.71 acre of palustrine forested and 0.12 acre of palustrine scrub-shrub wetlands.

For purposes of the U.S. Army Corps of Engineers (USACE), PCGP agrees that all wetlands/waterbodies affected by the Pipeline are jurisdictional. PCGP understands that jurisdiction for purposes of Oregon Department of State Lands (DSL) will be determined through the concurrence process for the wetland delineation report.

Several appendices to Attachment C address potential effects of the Pipeline on physical, chemical, and biological components of the aquatic environment. The majority of these reports were developed in consultation with Oregon Department of Environmental Quality (ODEQ) to address 401 water quality certification issues. These reports include:

Appendix N.2	Turbidity-Nutrients-Metals Water Quality Impacts Analysis
Appendix O.2	Stream Crossing Risk Analysis and Addendum
Appendix P.2	Stream Crossing Hyporheic Analysis
Appendix Q.2	Revised Draft Thermal Impacts Assessment
Appendix R.2	Mine Hazards Evaluation and Mercury Testing at the Red Cloud, Mother Lode, Nivinson, and Elkhorn Mining Groups
Appendix S.2	Potential for natural-occurring mercury mineralization to enter the aquatic environment between M.P. 109 and East Fork Cow Creek
Appendix T.2	Channel Migration and Scour Analysis
Appendix U.2	HGM Report

Federally Listed Threatened and Endangered Species

PCGP prepared Resource Report 3 as part of the September 2017 FERC Certificate application (provided electronically with the JPA), which provided detailed information regarding federal and state-listed species, impacts to them, and proposed mitigation measures. PCGP will submit an Applicant-Prepared Draft Biological Assessment to the Federal Energy Regulatory Commission (FERC), which will detail impacts to federally-listed species. PCGP has been consulting with U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), U.S. Forest Service, Bureau of Land Management (BLM), and Oregon Department of Fish and Wildlife (ODFW) throughout the FERC pre-filing and National Environmental Policy Act (NEPA) process and will continue to do so throughout the various federal and state permitting processes.

Cultural Resources

PCGP prepared Resource Report 4 (provided electronically with the JPA) and various cultural resource survey reports based on survey activities between 2006 and 2017 that have been submitted to FERC, State Historic Preservation Officer (SHPO), Forest Service, BLM, Bureau of Reclamation (BOR), USACE, and Native American Indian Tribes that may have interest in the Project. PCGP continues to consult with these agencies and communicate with Tribes regarding review of and mitigation for various cultural resources. PCGP is in the process of contacting landowners and securing permits to conduct cultural resources surveys on unsurveyed properties. As stipulated in Resource Report 4, the Project Historic Properties Management Plan (HPMP) will be updated to include site-specific avoidance and protection plans following completion of all surveys, but prior to construction. Currently, the schedule for the completion of all surveys is between October 1, 2017 and the fourth quarter of 2018, subject to obtaining access to denied areas. PCGP will ensure that all remaining cultural resources investigations, as identified in the project HPMP, are completed prior to construction. FERC is the lead agency for Section 106 consultation.

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

B. Describe the existing navigation, fishing and recreational use of the waterway or wetland.
The Pipeline will affect 207 perennial and intermittent waterbodies with various associated navigational, fishing and recreational uses. Table 2.2-1 in Attachment C describes the beneficial uses of the basins crossed by the Pipeline. Table A.2-2 in Appendix A.2 to Attachment C lists the Oregon Department of Forestry stream classification for each waterbody crossed. The Fish Utilization table (B.3-4) in the 'Tables' section also includes the fish presence for each waterbody crossed by the Pipeline. Two horizontal directional drills (HDDs) are proposed across Coos Bay, which will avoid impacts to navigation, fishing and recreational uses within the estuary. HDDs are also proposed for the Coos, Rogue, and Klamath rivers, and a Direct Pipe® method is proposed for one of the South Umpqua River crossings (the other crossing of the South Umpqua River at MP 94.73 is proposed as a diverted open cut).

(5) PROJECT SPECIFIC CRITERIA AND ALTERNATIVES ANALYSIS

Describe project-specific criteria necessary to achieve the project purpose. Describe alternative sites and project designs that were considered to avoid or minimize impacts to the waterway or wetland.
Due to the linear nature of a pipeline, it is impossible to avoid crossing wetlands and waterbodies along the 229 miles of the alignment. As detailed in Attachment B/Alternatives, the preferred route was developed by considering construction requirements for a large diameter, high pressure, natural gas transmission pipeline. Constructability/integrity requirements were the primary consideration for routing the Pipeline while minimizing potential impacts to sensitive resources such as the number of waterbody and wetland crossings (in compliance with the USACE 404(b)(1) guidelines) and landowner encumbrances. Avoidance of scenic waterways, byways, wildernesses, national parks and monuments was also a factor in development of the proposed alignment. Where practicable, the alignment utilized existing pipeline and powerline corridors while maintaining a safe distance between these existing utilities and the proposed Pipeline. Based on the routing feasibility analysis, a cross-country route was selected which traverses ridgelines and watershed boundaries to ensure the safety, stability, and long-term integrity of the Pipeline. By following ridgelines and watershed boundaries, the route significantly avoids and minimizes impacts to wetlands and waterbodies.

The alignment has been developed through an iterative process that included numerous meetings with landowners, federal and state agencies, the Confederated Tribes of Coos, Lower Umpqua and Siuslaw, the Coquille Indian Tribe, the Klamath Tribes, the Confederated Tribes of Siletz Indians, the Confederated Tribes of Grand Ronde and the Cow Creek Band of Umpqua Tribe of Indians.

The proposed alignment is based on routes that were publicly scoped, reviewed, and analyzed as part of FERC's NEPA process under Docket No. CP07-441-000, which is documented in FERC's Draft Environmental Impact Statement (EIS) (FERC 2008) and Final EIS (FERC 2009) as well as under Docket No. CP13-492-000, which is documented in FERC's Draft EIS (FERC 2014) and Final EIS (FERC 2015).

(6) PROJECT DESCRIPTION

A. Briefly summarize the overall project including work in areas both in and outside of waters or wetlands.
Attachments A/Project Description and C/Affected Water Resources detail the construction procedures to install the Pipeline in upland and wetland areas, as well as across waterbodies. Most waterbodies will be crossed using a dry crossing method (i.e., fluming or dam and pump) in order to isolate the work area from the stream flow. Fluming Procedures are provided in Appendix C.2 and Dam and Pump Procedures are provided in Appendix D.2 to Attachment C. A conventional bore crossing is proposed for the Medford Aqueduct/ MP133.38 and for Bureau of Reclamation jurisdictional ditches in Klamath County. These are noted on Table A.2-2 in Appendix A.2 in Attachment C. Waterbody crossing plans and figures are provided in Appendix E. 2 to Attachment C. The South Umpqua River will be crossed twice. PCGP proposes to cross I-5, the South Umpqua River (MP 71.27), Dole Road, and a railroad using a single Direct Pipe® crossing. The Direct Pipe® Technology Overview and Design Report for this crossing is provided in Appendix J.2 to Attachment C. The second crossing of the South Umpqua River (MP 94.73) will be crossed using a diverted open-cut (see Appendix E.2 to Attachment C for the Site-Specific Crossing Plan and Design Support Report). The Coos (MP 11.13R), Rogue (MP 122.65), and Klamath (MP 199.38) rivers are proposed as horizontal directional drills (HDDs). Appendix G.2 to Attachment C provides the HDD Design Reports for the three HDD crossings. An approximate 5,200-foot HDD will be utilized to cross the Coos Bay estuary from the North Spit at about MP 0.12 to MP 1.11 south of North Point on the west side of Highway 101. The HDD will cross the Coos Bay Rail line at MP 0.36 and the shipping channel at MP 0.66. Additionally, from MP 1.40 to MP 3.09, an approximate 9,000-foot HDD will be utilized for the second crossing of the Coos Bay estuary and will cross the shipping channel again at MP 1.6 (see Appendix G.2 to Attachment C for the HDD Feasibility Evaluations for these HDD crossings). Appendix H.2 and Appendix I.2 to Attachment C also provide PCGP's Drilling Fluid Contingency Plan and Failure Mode Procedures for HDD Pipeline Installation Methods.

(6) PROJECT DESCRIPTION

B. Describe work within waters and wetlands.
See Response to A. above.

C. Construction Methods. Describe how the removal and/or fill activities will be accomplished to minimize impacts to waters and wetlands.
Attachments A and C detail the construction procedures for the Pipeline in uplands, wetlands, and waterbodies. Most waterbodies will be crossed using a dry crossing method (i.e., fluming or dam and pump) in order to isolate the work area from the stream flow. PCGP will implement the measures in the Spill Prevention, Containment, and Countermeasures Plan (SPCC - see Appendix B.2 to Attachment C) as well as the BMPs described in the Erosion Control and Revegetation Plan (ECRP) (see Appendix B.1 to Attachment A) and FERC's Wetland and Waterbody Construction and Mitigation Procedures (Attachment B to the ECRP) and FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (Attachment A to the ECRP).

The following plans describe the Best Management Practices that will be implemented to minimize potential effects to wetlands and waterbodies during pipeline construction:

- ECRP (Appendix B.1 to Attachment A)
- FERC's Wetland and Waterbody Procedures (Attachment B to ECRP provided in Appendix B.1 to Attachment A)
- FERC's Upland Plan (Attachment A to ECRP provided in Appendix B.1 to Attachment A)
- SPCC Plan (Appendix B.2 to Attachment C)
- Stream Crossing Risk Analysis (Appendix O.2 to Attachment C)
- Hydrostatic Test Plan (Appendix W.2 to Attachment C)
- Culvert Crossing Best Management Practices (Attachment F to ECRP in Appendix B.1 to Attachment A)
- Contaminated Substances Discovery Plan (Attachment E)
- Fish Salvage Plan (Attachment H)
- Wetland and Waterbody Mitigation Plan (Attachment I)

All work in waterbodies will be isolated from flowing water by utilizing dry crossing methods:

- Fluming Procedures (Appendix C.2 to Attachment C)
- Dam and Pump Procedures (Appendix D.2 to Attachment C)
- Diverted Open Cut Design (South Umpqua River #2 Crossing Plan - Appendix E.2 to Attachment C)
- Waterbody Crossing Plans and Figures for the N. Fork Coquille River, E. Fork Coquille River, S.F. Little Butte Creek, Lost River, and Medford Aqueduct (Appendix E.2 to Attachment C).
- HDD Design Reports (Coos River, Rogue River, and Klamath River) and Coos Bay HDD Feasibility Analyses (Appendix G.2 to Attachment C).
- A Direct Pipe® installation has been proposed to minimize impacts to the South Umpqua River #1. An overview of Direct Pipe® technology and a Design Report is provided in Appendix J.2 to Attachment C.

D. Describe source of fill material and disposal locations if known.

Native material that is removed from the pipeline trench during excavation will be used to backfill once the pipe is installed in the trench. Fill material will be the native soil or gravel material that is screened to exclude rock greater than a predetermined size. Appendix O.2 to Attachment C/Affected Water Resources also includes the Stream Crossing Risk Analysis, which provides the Bioengineered Best Management Practices using rock and large woody debris (LWD) for stream channel bed and bank restoration. These site-specific BMPs were developed based on field observation of natural analog structures and widely accepted techniques for bank restoration, bed restoration, and aquatic habitat restoration techniques.

(6) PROJECT DESCRIPTION

E. Construction timeline.

What is the estimated project start date?	Fourth Quarter 2019
What is the estimated project completion date?	Fourth Quarter 2022
Is any of the work underway or already complete? If yes, describe.	☐ Yes ☑ No

F. Fill Volumes and Dimensions (if more than 4 impact sites, include a summary table as an attachment)

Wetland / Waterbody Name *	Fill Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq.ft. or ac.)	Volume (c.y.)		
See Tables A.2-2 and A.2-3 in Appendix A.2 to Attachment C for removal and fill volumes and dimensions in wetlands and waterbodies.							Native material removed from pipeline trench will be used to backfill the trench once the pipeline is placed.

Appendix J also provides PCGP's estimated fill quantities associated with rock and wood stream crossing restoration bioengineered BMPs, as outlined in the Stream Crossing Risk Analysis included in Appendix O.2 to Attachment C/Affected Water Resources.

G. Total Fill Volumes and Dimensions

Fill Impacts to Waters	Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)
Total Fill to Wetlands	Same as total removal volumes.		
Total Fill Below Ordinary High Water			
Total Fill Below Highest Measured Tide			
Total Fill Below High Tide Line			
Total Fill Below Mean High Water Tidal Elevation			

H. Removal Volumes and Dimensions (if more than 4 impact sites, include a summary table as an attachment)

Wetland / Waterbody Name*	Removal Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq. ft. or ac.)	Volume (c.y.)		
See Tables A.2-2 and A.2-3 in Appendix A.2 to Attachment C for removal and fill volumes and dimensions in wetlands and waterbodies.							Native material removed from pipeline trench will be used to backfill the trench once the pipeline is placed.

Appendix J also provides PCGP's estimated fill quantities associated with rock and wood stream crossing restoration bioengineered BMPs, as outlined in the Stream Crossing Risk Analysis included in Appendix O.2 to Attachment C/Affected Water Resources.

I. Total Removal Volumes and Dimensions

Removal Impacts to Waters	Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)
Total Removal to Wetlands	30,777.58	113.98 acres	51,295.93
Total Removal Below Ordinary High Water	3,027.85		8,079.79 (295) [1]
Total Removal Below Highest Measured Tide			
Total Removal Below High Tide Line			
Total Removal Below Mean High Water Tidal Elevation			

* If there is no official name for the wetland or waterway, create a unique name (such as "Wetland 1" or "Tributary A").
** Indicate the days, months or years the fill or removal will remain. Enter "permanent" if applicable. For DSL, permanent removal or fill is defined as being in place for 24 months or longer.
*** Example: soil, gravel, wood, concrete, pilings, rock etc.
[1] 295 CY estimated fill associated with rock and wood Bioengineered BMPs as outlined in the Stream Crossing Risk Analysis (Appendix O.2 to Attachment C/Affected Water Resources). The estimated fill quantities for these BMPs is provided in Appendix J.

(7) ADDITIONAL INFORMATION

Are there any state or federally listed species on the project site?	☑ Yes	☐ No	☐ Unknown
Is the project site within designated or proposed critical habitat?	☑ Yes	☐ No	☐ Unknown
Is the project site within a national Wild and Scenic River?	☐ Yes	☑ No	☐ Unknown
Is the project site within the 100-year floodplain?	☑ Yes	☐ No	☐ Unknown

*** If yes to any of the above, explain in Block 4 and describe measures to minimize adverse effects to these resources in Block 5.**

Is the project site within the Territorial Sea Plan (TSP) Area?	☐ Yes	☑ No	☐ Unknown

*** If yes, attach TSP review as a separate document for DSL.**

Is the project site within a designated Marine Reserve?	☐ Yes	☑ No	☐ Unknown

*** If yes, certain additional DSL restrictions will apply.**

Will the overall project involve construction dewatering or ground disturbance of one acre or more?	☑ Yes	☐ No	☐ Unknown

*** If yes, you may need a 1200-C permit from the Oregon Department of Environmental Quality (DEQ).**

Is the fill or dredged material a carrier of contaminants from on-site or off- site spills?	☐ Yes	☑ No	☐ Unknown
Has the fill or dredged material been physically and/or chemically tested?	☐ Yes	☑ No	☐ Unknown

***If yes, explain in Block 4 and provide references to any physical/chemical testing report(s).**

Has a cultural resource (archaeological) survey been performed on the project area?	☑ Yes	☐ No	☐ Unknown

*** If yes, provide a copy of the survey with this application. Do not describe any resources in this document.**

Identify any other federal agency that is funding, authorizing or implementing the project.

Agency Name	Contact Name	Phone Number	Most Recent Date of Contact
FERC is the lead federal agency.			

List other certificates or approvals/denials required or received from other federal, state or local agencies for work described in this application. For example, certain activities that require a Corps permit also require 401 Water Quality Certification from Oregon DEQ.

Approving Agency	Certificate/ approval / denial description	Date Applied
	See Table 1.6-1 in Attachment A for a list of permits and authorizations required for the Project.	

Other DSL and/or Corps Actions Associated with this Site (Check all that apply.)

☐ Work proposed on or over lands owned by or leased from the Corps

☐ State owned waterway — DSL Waterway Lease #

☐ Other Corps or DSL Permits — Corps # — DSL #

☐ Violation for Unauthorized Activity — Corps # — DSL #

☑ Wetland and Waters Delineation — Corps # — DSL #

- ☑ A wetland / waters delineation has been completed (if so, provide a copy with the application)
- ☑ The Corps has approved the wetland / waters delineation within the last 5 years
- ☑ DSL has approved the wetland / waters delineation within the last 5 years

(8) IMPACTS, RESTORATION/REHABILITATION, COMPENSATORY MITIGATION

A. Describe unavoidable environmental impacts that are likely to result from the proposed project. Include permanent, temporary, direct, and indirect impacts.

The Pipeline will not require any permanent wetland fill. However, approximately 0.83 acre of wetland type conversion impacts would occur where maintenance of the Pipeline's operational corridor would convert forested or scrub-shrub wetlands to a different wetland type to facilitate corrosion and leak surveys, as allowed by U.S. Department of Transportation (DOT) and FERC (see Section V.D.1 and VI.D.1 in FERC's Procedures included in Attachment B to the ECRP in Appendix B.1 to Attachment A/Project Description).

B. For temporary removal or fill or disturbance of vegetation in waterways, wetlands or riparian (i.e., streamside) areas, discuss how the site will be restored after construction.

Please see the Wetland and Waterbody Mitigation Plan included as Attachment I. Also see Section 10.0 (Restoration) in the ECRP in Appendix B.1 to Attachment A.

Compensatory Mitigation

C. Proposed mitigation approach. Check all that apply:

- ☑ Permittee-responsible Onsite Mitigation
- ☑ Permittee-responsible Offsite mitigation
- ☐ Mitigation Bank or in-lieu fee program
- ☐ Payment to Provide (not approved for use with Corps permits)

D. Provide a brief description of mitigation approach and the rationale for choosing that approach. If you believe mitigation should not be required, explain why.

See Section 2.3.4.1 in Attachment C/Affected Water Resources and Table A.2-3 in Appendix A.2 to Attachment C for a description of the wetland impacts associated with construction of the Pipeline. Section 2.3.4.2 in Attachment C and the Wetland and Waterbody Mitigation Plan (see Attachment I) describe the measures that will be implemented to restore/rehabilitate all wetlands affected by the Pipeline.

To mitigate for the 0.83 acre of permanent wetland vegetation type conversion impacts, PCGP proposes to co-locate compensatory mitigation efforts with the LNG Terminal mitigation efforts at the former Kentuck Golf Course in Coos County (Kentuck Project). The Pipeline component of the Kentuck Project would be required to enhance a minimum of 2.49 acres of degraded emergent wetlands within the golf course to mixed forested and scrub-shrub wetlands based on a ratio of 3:1. The compensatory mitigation plan is in conformance with USACE and DSL compensatory wetland mitigation requirements. The proposed mitigation would improve hydrologic function within the wetland by removing existing levees and regrading the site to improve hydrology and micro-topography to support a variety of plant species and providing access and refugia to fish during high flow events. Impacts from pipeline construction would be primarily a result of conversion from a mixture of forested and shrub wetlands to a mixture of shrub and herbaceous wetlands. The compensatory wetland mitigation plan will convert existing, degraded pasture wetland within the former golf course to complex native forested wetland, essentially a reversal of the proposed Pipeline impacts. Approximately 9.12 acres of mitigation will be undertaken to achieve this goal, including 6.63 acres of voluntary habitat improvements (above the minimum mitigation requirements). The Compensatory Wetland Mitigation Plan is provided in Attachment J to Part 2 of the Joint Permit Application.

As indicated in the Compensatory Wetland Mitigation Plan, Pipeline construction impacts to wetlands requiring mitigation consist of small impacts spread over a long distance in multiple watersheds; therefore, it is not practical to provide local mitigation for each impact. The emphasis of mitigation planning turned to consolidating mitigation in a single location that would have a high likelihood of success (i.e., the Kentuck Project site). It is also important to note that the Pipeline impacts will result only in a partial loss of wetland functions, as opposed to a loss of acreage and all functions, because the wetlands will remain following construction, but with what is considered to be a lower functioning habitat type than existed before the Pipeline. These functional wetland impacts will be offset at the consolidated Kentuck Project site which will provide clear ecosystem benefits by restoring floodplain connection to Kentuck Creek, which will in turn benefit flood control, water quality, wildlife, and fish functions, including providing high flow refugia and food chain support that will directly benefit listed coho salmon.

(8) IMPACTS, RESTORATION/REHABILITATION, COMPENSATORY MITIGATION

Mitigation Bank / In-Lieu Fee Information:
Name of mitigation bank or in-lieu fee project: N/A
Type of credits to be purchased: N/A

If you are proposing permittee-responsible mitigation, have you prepared a compensatory mitigation plan?

☑ Yes. Submit the plan with this application and complete the remainder of this section.
(see Attachment J to Part 2 of the Joint Permit Application)

☐ No. A mitigation plan will need to be submitted (for DSL, this plan is required for a complete application).

Mitigation Location Information (Fill out only if permittee-responsible mitigation is proposed)

Mitigation Site Name/Legal Description	Mitigation Site Address	Tax Lot #
Kentuck Project Site (Kentuck Golf Course)	5,500 feet northeast of the intersection of East Bay Road and Golf Course Lane. See Attachment J to Part 2 of the Joint Permit Application.	Tax Map: 25S12W06C Lot: 0010000400
County Coos	City North Bend	Latitude & Longitude (in DD.DDDD format) 43.42811526, -124.1762352

Township	Range	Section	Quarter/Quarter
25S	12W	6	

(9) ADJACENT PROPERTY OWNERS FOR PROJECT AND MITIGATION SITE

☑ Pre-printed mailing labels of adjacent property owners attached	Project Site Adjacent Property Owners	Mitigation Site Adjacent Property Owners

Contact Name
Address 1
Address 2
City, ST ZIP Code

Contact Name
Address 1
Address 2
City, ST ZIP Code

Contact Name
Address 1
Address 2
City, ST ZIP Code

Contact Name
Address 1
Address 2
City, ST ZIP Code

Contact Name
Address 1
Address 2
City, ST ZIP Code

Contact Name
Address 1
Address 2
City, ST ZIP Code

Contact Name
Address 1
Address 2
City, ST ZIP Code

Contact Name
Address 1
Address 2
City, ST ZIP Code

(10) CITY/COUNTY PLANNING DEPARTMENT LAND USE AFFIDAVIT (TO BE COMPLETED BY LOCAL PLANNING OFFICIAL)

I have reviewed the project described in this application and have determined that:

- ☐ This project is not regulated by the comprehensive plan and land use regulations.
- ☐ This project is consistent with the comprehensive plan and land use regulations.
- ☐ This project will be consistent with the comprehensive plan and land use regulations when the following local approval(s) are obtained:
  - ☐ Conditional Use Approval
  - ☐ Development Permit
  - ☐ Other Permit (see comment section)
- ☐ This project is not consistent with the comprehensive plan. Consistency requires:
  - ☐ Plan Amendment
  - ☐ Zone Change
  - ☐ Other Approval or Review (see comment section)

An application ☐ has ☐ has not been filed for local approvals checked above.

Local planning official name (print)	Title	City / County (circle one)

Signature	Date

Comments:

(11) COASTAL ZONE CERTIFICATION

If the proposed activity described in your permit application is within the Oregon coastal zone, the following certification is required before your application can be processed. A public notice will be issued with the certification statement, which will be forwarded to the Oregon Department of Land Conservation and Development (DLCD) for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program, contact DLCD at 635 Capitol Street NE, Suite 150, Salem, Oregon 97301 or call 503-373-0050.

CERTIFICATION STATEMENT

I certify that, to the best of my knowledge and belief, the proposed activity described in this application complies with the approved Oregon Coastal Zone Management Program and will be completed in a manner consistent with the program.

Print /Type Name Elizabeth Spomer	Title
Signature	Date

(12) SIGNATURES

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and belief, this information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities. By signing this application I consent to allow Corps or DSL staff to enter into the above-described property to inspect the project location and to determine compliance with an authorization, if granted. I hereby authorize the person identified in the authorized agent block below to act in my behalf as my agent in the processing of this application and to furnish supplemental information in support of this permit application. I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. I understand that payment of the required state processing fee does not guarantee permit issuance.
To be considered complete, the fee must accompany the application to DSL. The fee is not required for submittal of an application to the Corps.

Fee Amount Enclosed	$

Applicant Signature	
Print Name Elizabeth Spomer	Title
Signature	Date

Authorized Agent Signature	
Print Name	Title
Signature	Date

Landowner Signature(s)	
Landowner of the Project Site (if different from applicant)	
Print Name **As required by FERC, PCGP must obtain an easement across all properties affected by the Pipeline (through negotiations or condemnation) prior to construction.**	Title
Signature	Date

Landowner of the Mitigation Site (if different from applicant)	
Print Name	Title
Signature	Date

Department of State Lands, Property Manager (to be completed by DSL)	
If the project is located on state-owned submerged and submersible lands, DSL staff will obtain a signature from the Land Management Division of DSL. A signature by DSL for activities proposed on state-owned submerged/submersible lands only grants the applicant consent to apply for a removal-fill permit. A signature for activities on state-owned submerged and submersible lands grants no other authority, express or implied and a separate proprietary authorization may be required.	
Print Name	Title
Signature	Date

(13) ATTACHMENTS

- ☐ **Drawings (items in bold are required)**
  - ☐ **Location map with roads identified**
  - ☐ **U.S.G.S topographic map**
  - ☐ **Tax lot map**
  - ☐ **Site plan(s)**
  - ☐ **Cross section drawing(s)**
  - ☐ **Recent aerial photo**
  - ☐ Project photos
  - ☐ Erosion and Pollution Control Plan(s), if applicable
  - ☐ DSL/Corps Wetland Concurrence letter and map, if approved and applicable
- ☐ Pre-printed labels for adjacent property owners (Required if more than 5)
- ☐ Restoration plan or rehabilitation plan for temporary impacts
- ☐ Mitigation plan
- ☐ Wetland functional assessment and/or stream functional assessment
- ☐ Alternatives analysis
- ☐ Biological assessment (if requested by Corps project manager during pre-application coordination.)
- ☐ Stormwater management plan (may be required by the Corps or DEQ)
- ☐ Other:
  - ☐
  - ☐

Send Completed form to:

U.S. Army Corps of Engineers
ATTN: CENWP-OD-GP
PO Box 2946
Portland, OR 97208-2946
Phone: 503-808-4373

Counties:
Baker, Clackamas, Clatsop, Columbia, Gilliam, Grant, Hood River, Jefferson, Lincoln, Malheur, Marion, Morrow, Multnomah, Polk, Sherman, Tillamook, Umatilla, Union, Wallowa, Wasco, Washington, Wheeler, Yamhill

OR

U.S. Army Corps of Engineers
ATTN: CENWP-OD-GE
211 E. 7th AVE, Suite 105
Eugene, OR 97401-2722
Phone: 541-465-6868

Counties:
Benton, Coos, Crook, Curry, Deschutes, Douglas Jackson, Josephine, Harney, Klamath, Lake, Lane, Linn

Send Completed form to:

DSL - West of the Cascades:

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
Phone: 503-986-5200

OR

DSL - East of the Cascades:

Department of State Lands
1645 NE Forbes Road, Suite 112
Bend, Oregon 97701
Phone: 541-388-6112

Send all Fees to:
Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
Pay by Credit Card Online:
https://apps.oregon.gov/dsl/EPS/

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, PORTLAND DISTRICT
NORTH BEND FIELD OFFICE
2201 N. BROADWAY, SUITE C
NORTH BEND, OREGON 97459-2372

November 3, 2017

Operations Division

SUBJECT: Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline Project
Corps No. NWP-2017-41

Ms. Caroline Burda
Jordan Cove LNG, LLC.
5615 Kirby Drive, Suite 500
Houston, Texas 77005
caroline.burda@jordancovelng.com

Dear Ms. Burda:

The U.S. Army Corps of Engineers (Corps) received the Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline Project's (JCLNG) request for Department of Army (DA) authorization to construct a liquefied natural gas export terminal and appurtenant features. The application identified the following additional project components: a pipeline, slip and access channel, marine offloading facility, dredging near the Coos Bay Federal Navigation Channel, dredged material disposal locations, improvements to TransPacific Parkway, a utility/access road, two mitigation sites, a worker's camp, and a resource center. JCLNG's project has been assigned Corps No. NWP-2017-41. Please refer to this number in all future correspondence.

The Corps' regulatory authority is found primarily in the Rivers and Harbors Act of 1899 (RHA) and the Clean Water Act (CWA). Under Section 10 of the RHA, the Corps possesses the authority to issue permits for structures or work (including excavation) in or affecting navigable waters of the United States. The limits of our jurisdiction extend landward up to the mean high water mark in tidally influenced areas and to the ordinary high water mark in non-tidal, navigable waters.

Under Section 404 of the CWA, the Corps authority to issue permits for the placement of dredged or fill material into waters of the United States. The term "waters of the United States" includes the territorial seas and tidally influenced waters. Limits of jurisdiction under Section 404 extend landward to the high tide line. "Waters" also include all other waters that are part of a surface tributary system to and including navigable (non-tidal) waters of the United States. Limits of jurisdiction extend landward up to the ordinary high water mark. Wetlands adjacent to these waters are also "waters of the United States."

The proposed work exceeds the screening thresholds of our Nationwide and General Permits and will be evaluated as a Standard Individual Permit. This process affords the public to provide comment regarding the proposed project.

Corps regulations found at 33 CFR 325.1(d)(2) require that all activities which an applicant plans to undertake that are reasonably related to the same project, and for which a DA permit would be required, be included in the same permit application. Further, District Engineers should reject, as incomplete, any permit application which fails to comply with this requirement. The contents of a complete application are defined in 33 CFR 325.1(d).

The Corps has determined your application is incomplete. Before the public notice can be issued, we will need the following information *(please note all drawings must be in 8.5 by 11-inch format, legible and reproducible in black and white)*:

a. A dredged material disposal and management plan for all proposed dredged material disposal sites (33 CFR 325.1(d)(3)). The proposed action includes relocation of dredged material to several offsite locations. Disposal plans in general, and for each site, need to include both plan and elevation view drawings and a description of all work or activities necessary to prepare the disposal site to receive dredged material. For example, would existing ground surfaces be excavated or berms created to contain dredged material? To assist you we are providing a list of the information necessary by disposal site:

1) LNG Terminal site:

    a. A dredged material disposal and management plan;

2) South Dunes site:

    a. A dredged material disposal and management plan;

3) The proposed Kentuck Slough compensatory mitigation site:

    a. Plan and elevation view drawings of ground disturbing activities (33 CFR 325.d(2);

    b. A dredged material disposal and management plan;

b. An elevation view drawing of ground disturbing activities at the proposed eelgrass mitigation site (33 CFR 325.1(d)(2));

c. A plan and elevation view drawing depicting how and where dredged material return water would discharge to Coos Bay from the APCO east (Mainland) confined disposal area (33 CFR 325.1(d)(3));

Before authorizing work under our statutory authorities, the Corps must ensure a project complies with other applicable Federal laws and regulations such as the Endangered Species Act (ESA) and Cultural Resources laws. All actions will be coordinated with the appropriate Native American Indian Tribes. The Corps anticipates Federal Energy Regulatory Commission (FERC) in their role as the lead agency, will fulfill these procedural and legal requirements with the assistance of the Corps.

The project may affect several species and their habitats as protected under the ESA and the Magnuson-Stevens Fishery Conservation and Management Act. As such, the Corps, in coordination with the FERC, will need to consult with both the U.S. Fish & Wildlife Service and the National Marine Fisheries Service. The Corps cannot complete our evaluation and JCLNG may not begin work until this requirement has been fulfilled.

The Standard Individual Permit under which we are evaluating your project requires an individual 401 WQC from the Oregon Department of Environmental Quality (DEQ). To expedite the process, JCLNG should provide a copy of the permit application package to the DEQ. The permit application package can be sent to Mr. Chris Stine at DEQ at 1102 Lincoln Street, Suite 210, Eugene, Oregon 97401. Mr. Stine may be reached by telephone at (541) 686-7810 or by email at stine.chris@deq.state.or.us.

The Standard Individual Permit under which we are evaluating your project requires an individual CZMA concurrence from the Oregon Department of Land Conservation and Development (DLCD). To expedite the process, JCLNG should provide a copy of the permit application package to the DLCD. The permit application package can be sent to Ms. Elizabeth Ruther of the DLCD at 635 Capitol St. NE, Suite 150, Salem, Oregon 97301-2540. Ms. Ruther may be reached by telephone at (503) 934-0029, or by email at elizabeth.j.ruther@state.or.us.

You indicate JCLNG may need to upgrade or rehabilitate a number of road crossings particularly those along the route of the proposed pipeline. Please be advised the need to replace or improve waterbody crossings required for pipeline access, construction, staging, or maintenance activities may require a DA permit. The Section 404 CWA maintenance exemption applies to currently serviceable structures where no change in character, scope, or size of the original fill prism would occur (33 CFR 323.4(a)(2)).

The Portland Sediment Evaluation Team (PSET) has reviewed the data from the previous iteration of the project pursuant to the Sediment Evaluation Framework (SEF) for the Pacific Northwest. Enclosed is a copy of the Suitability Determination Memorandum (SDM) for the Project (Enclosure 1). Due to project changes and the span of time from the initial SDM, the PSET's previous evaluation may need to be updated. The PSET recommends reviewing the January 2016 SDM and TABLE A to highlight, delete, or add project changes that correlate to PSET review. Examples include, but are not limited to, dredging, re-use of dredged materials in waters/wetlands, stream crossings, in-water and wetland mitigation areas, and any new contaminant information available.

To facilitate PSET review, please prepare a 2016 SEF Level 1 analysis for areas where all project changes have occurred. Data to support the analysis should be provided in a tabular format consistent with the format utilized for the PSET's previous project review. You may either create a new spreadsheet or utilize the previous January 2016 SDM and TABLE A as a starting point to provide additional project information. Providing the data in this format will ensure the PSET can receive information in a manner that assists them in evaluating the proposal effectively under the 2016 SEF. Further, the PSET recommends reviewing sections 3.1 and 3.2 of the 2016 SEF regarding the level of detail and type of Level 1 information required for PSET review and requests JCLNG utilize the 2016 SEF and the updated marine analytes list (SEF Table 5-1) with the respective marine screening levels (SEF Table 6-2).

Information regarding the 2016 SEF can be found at the following website: http://www.nwp.usace.army.mil/Portals/24/docs/environment/sediment/2016_SEF_Pacific_NW.pdf. The PSET lead for Corps Portland District is Mr. James Holm. Mr. Holm may be reached at (503) 808-4963 or James.A.Holm@usace.army.mil. A Level 1 SEF site history information guidance document is enclosed for your reference (Enclosure 2).

Please clarify if the Project is seeking a Preliminary Jurisdictional Determination (JD) or Approved JD for the proposed action. A JD is a written indication that wetlands and waterways within your project area may be waters of the United States. Such waters will be treated as jurisdictional waters of the United States for purposes of computation of impacts and compensatory mitigation requirements. As referenced in Attachment C of JCLNG's application, the Corps has previously provide Preliminary JD's for multiple aquatic resources found within the project area. The enclosed forms can assist you in rendering a decision regarding which type of JD the project is seeking (Enclosure 3 and 4).

Under Section 14 of the RHA codified in 33 USC 408 (Section 408) authorizes the Secretary of the Army (Secretary), on the recommendation of the Chief of Engineers of the Corps, to grant permission for the alteration, occupation or use of a Corps Civil Works Project if the Secretary determines the activity will not be injurious to the public interest and will not impair the usefulness of the project. A DA permit cannot be issued prior to a District decision regarding the need for, or resolution of, Section 408 permission.

The Corps' decision to issue a permit, issue a permit with conditions, or deny the permit request will be based upon an evaluation of the probable impacts including cumulative impacts of the proposal and its intended use on the public interest. During this review the benefits, which may reasonably be expected to accrue from the proposal, are balanced against its reasonably foreseeable detriments.

We remain committed to working with the FERC to ensure the information contained in the forthcoming National Environmental Policy Act evaluation and consultation/coordination processes is sufficient for the Corps to render a permit decision. Working before obtaining a DA permit is a violation of Federal laws. Receipt of a permit from the Oregon Department of State Lands (DSL) does not obviate the requirement for obtaining a DA permit prior to commencing the proposed work.

Please provide the information requested within 30 days of the date of this letter. Once the requested information is provided, we will continue to process and evaluate your application. If we do not receive the requested information within 30 days we will withdraw your application.

Please direct any questions regarding the Corps' Regulatory Program or process to Mr. Tyler J. Krug, by telephone at (541) 756-2097, or by email at Tyler.J.Krug@usace.army.mil. Questions regarding the 408 process should be directed to Ms. Marci E. Johnson at (503) 808-4765, (503) 915-3551, or via email at Marci.E.Johnson@usace.army.mil.

Sincerely,

Tyler Krug

Tyler J. Krug
Project Manager
Eugene Permit Section
Regulatory Branch

Enclosures

cc:

Federal Energy Regulatory Commission (Peconom)
U.S. Army Corps of Engineers (Johnson/McMillan/Holm)
Oregon Department of State Lands (Lobdell)
Oregon Department of Environmental Quality (Camarata/Stine)
Oregon Department of Land Conservation and Development (Snow/Ruther)
Agent (Vowels)

CENWP-EC-HR (Sediment Quality) 19 January 2016

MEMORANDUM FOR FILE, Portland District, Regulatory Branch, (CENWP-OD-G, Krug)

RE: Portland Sediment Evaluation Team (PSET) Level 2A dredged material suitability determination memorandum (SDM) for construction of the Pacific Connector Gas Pipeline (PCGP), in Klamath, Jackson, Douglas and Coos Counties; and the Jordan Cove LNG (liquid natural gas) Project (JCLNG)[1] near North Bend, Coos County, Oregon (Regulatory File No. NWP-2012-441).

1.0 Introduction. The JCLNG and PCGP have applied to the Federal Energy Regulatory Commission (FERC) for approval to construct and operate a LNG terminal and natural gas pipeline. Due to their interconnectedness, these two projects are being jointly evaluated by the resource agencies as the Jordan Cove LNG and Pacific Connector Gas Pipeline Project (JCLNG-PCGP Project). The project would affect various wetlands and waterways located in Coos, Douglas, Jackson and Klamath counties.

1.1 The PSET's Role. The interagency PSET's primary mission is to evaluate the suitability of project sediments for unconfined, aquatic disposal; the PSET also evaluates the suitability of the post-dredge surface for unconfined, aquatic exposure. The PSET Agencies include the US Army Corps of Engineers – Portland District (Corps, lead), US Environmental Protection Agency – Region 10 (EPA, co-lead), National Marine Fisheries Service (NMFS), US Fish and Wildlife Service (USFWS), ODEQ, and Washington Department of Ecology (Ecology). Each of these agencies has regulatory authority over work proposed in waters of the United States.

1.2 State and Regional Sediment Evaluation Guidance. The PSET uses the following guidance documents to evaluate the suitability of project sediments:

- May 2009 *Sediment Evaluation Framework for the Pacific Northwest*, prepared by the Northwestern Regional Sediment Evaluation Team (RSET)
- 9 August 2009 "Supplemental Guidance for the Portland District: Sampling and Analysis Plan Preparation under the 2009 *Sediment Evaluation Framework for the Pacific Northwest*," prepared by the PSET
- April 2007 "Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment [Report No. 07-LQ-023A]" prepared by ODEQ

The PSET uses these guidance documents to ensure that projects permitted by the Portland District Regulatory Branch comply with the sediment evaluation regulations associated with the federal CWA[2] and MPRSA[3]. The PSET's interagency review is also used in the section 7 Endangered Species Act consultation.

1.3 Scope of PSET Evaluation. Federal regulatory authorities governing this project include:

☑ Section 10, Rivers and Harbors Act
☑ Section 404, Clean Water Act (CWA)
☑ Section 401, CWA
☑ Section 7, Endangered Species Act
☑ Section 305 of the Magnuson-Stevens Act

[1] Formerly known as the Jordan Cove Energy Project
[2] 40 CFR §230.60-230.61
[3] 40 CFR §227.12-227.13

☑ Section 103, Marine Protection, Research and Sanctuaries Act
☐ Comprehensive Environmental Response, Compensation, and Liability Act

Discharges of dredged or fill material into waters of the U.S., regulated by the Corps under section 404 of the Clean Water Act (CWA), are the primary focus of this SDM. Discharges of pollutants into waters of the state (regulated by the Oregon Department of Environmental Quality [ODEQ] under section 401 of the CWA) are also considered herein. The transport and disposal of dredged material into ocean waters, regulated by the EPA and Corps under section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA), are also briefly touched upon, because ocean disposal will be required for the maintenance of the JCLNG terminal.

This SDM documents the suitability of dredged and excavated sediments from the JCLNG-PCGP Project for unconfined, aquatic disposal. With the exception of the mercury testing along the PCGP (~MP 109), all sampling and analysis plans and subsequent sediment quality data were reviewed by the interagency PSET (or previous incarnations, the Project Review Group [PRG; 2008-2011] and the Regional Management Team [RMT; 1998-2007]). In this evaluation the PSET reviews all available sources of sediment quality data (see Section 1.4) and provides a determination of its suitability. Because sediment sampling was not conducted throughout the entire JCLNG-PCGP project, the PSET also looks to the CWA sediment testing regulations to determine if additional sediment testing is necessary.

Temporary and permanent facilities constructed in uplands, outside federal CWA jurisdiction, are not considered in this SDM. Upland facilities not considered include (but are not limited to):

- Pipeline installed in upland
- Upland parts of the LNG terminal
- Construction staging areas
- Power stations
- Main line valves
- Metering stations
- Compressor stations
- Communication arrays

Numerous documents were provided by the Regulatory Branch for the PSET's review. A list of these documents appears in Section 9 of this SDM.

2.0 Project Description. Due to the complexity of the proposed action, the project was distilled into three elements for the sediment evaluation:

- Proposed JCLNG marine slip and terrestrial wetland impacts
- Wetland and stream crossing impacts associated with the proposed PCGP
- Wetland and stream impacts associated with mitigation proposed for the JCLNG-PCGP project

These project elements are described in greater detail below.

2.1 JCLNG Marine Slip and Terrestrial Wetland Impacts.

Marine Slip Impacts – Construction of the access channel and slip for the JCLNG export terminal would generate about 5.6 million cubic yards (mcy) of dredged and excavated material (Table 1; Figure 1). Of the 5.6 mcy, about 2.3 mcy would be dry excavated in the proposed slip area north of and behind an earthen berm separating work in the upland from the bay during Phase 1 of the marine slip construction. Also in the upland area north of the berth, during "Fresh Water" Phase 2 construction of the slip, up to about 1.5 mcy of material would be dredged in the pocket behind the berm. About 0.5 mcy of material would be dredged during removal of the berm, during the "Salt Water" Phase 3 construction of the slip. Lastly, about 1.3 mcy of material would be dredged from the bay during

construction of the access channel between the current Coos Bay navigation channel and the proposed Jordan Cove terminal marine slip.

TABLE 1 – **Materials Excavated and Dredged During Construction of Terminal Marine Facilities**			
Area	**Construction Phase**	**Activity**	**Volumes (mcy)**
Slip	Upland - Phase 1	Land-based excavation	2.3
Slip	Fresh Water - Phase 2	Dredging in pocket behind berm	Up to 1.5
Slip	Salt Water – Phase 3	Dredging to remove berm	0.5
Access Channel	Salt Water – Phase 3	Dredging in bay	1.3
		Total:	**5.6**



Figure 1. JCLNG Marine Slip and Access Channel.

Most of the 5.6 mcy of material excavated from the slip and access channel would be used to raise the elevation of the proposed terminal facilities above the tsunami inundation zone (JCLNG discharges into terrestrial wetlands are described in the next section). A total of about 1.9 mcy would be placed on the LNG terminal upland process area. About 0.5 mcy of material from the removal of the berm between the northern portion of the slip and Coos Bay would be used for restoration of a dune on the east side of the slip area. The remaining materials (about 3.2 mcy) would be deposited at the former Weyerhaeuser linerboard site, which is the proposed location for the pipeline gas treatment facility and South Dunes Power Plant. The elevation of the base of the proposed LNG storage tanks would be raised to +30 feet, while the elevation of the process area at the terminal would be raised to about +46 feet. The elevation of the proposed South Dunes Power Plant area would be raised to about +46 to +48 feet.

Terrestrial sediment and soils would be excavated with conventional earthmoving equipment and transported by dump truck. The materials dredged from the proposed terminal slip and access channel would be slurried through a 20-inch polypropylene pipeline following the Coos Bay shoreline approximately 8,700 feet east to a nearby upland facility (the Weyerhaeuser linerboard mill site).

The proponent's preferred location for dredged material disposal is the ocean dredged material disposal site (ODMDS), Site F (Figure 2). In 2006, EPA designated Site F under section 102 of the MPRSA, primarily to handle dredged material from the Coos Bay federal navigation channel (FNC). The EPA and Corps jointly manage Site F for federal channel maintenance and disposal permitted by the Regulatory Branch (with EPA concurrence). Under regulatory permits, the maximum amount of material disposed at Site F was 25,200 cy in 2012 (permit No. NWP-2007-5). Prior to using this site, both the EPA and Corps have stipulated that the proponent must conduct a site capacity study that accounts for disposal of FNC maintenance material and other dredged material disposal permitted by the Corps.

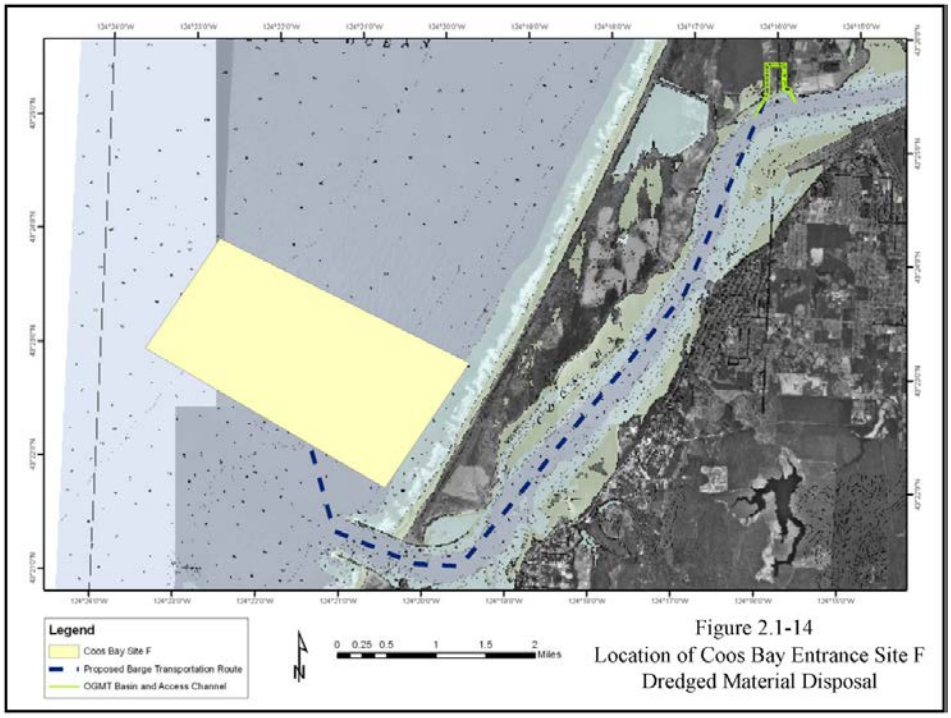

Figure 2. Coos Bay ODMDS, Site F.

Approximately 29.3 acres of estuarine habitat would be excavated to construct the marine slip and access channel (Table 2). Mitigation is proposed for the intertidal and shallow subtidal habitat impacts; mitigation is not proposed for excavation in the deep, subtidal zone.

Terrestrial Wetland Impacts – The JCLNG (through their consultant, SHN Consulting Engineers and Geologists, Inc.) conducted wetland delineations within the LNG terminal site as well as the South Dunes Power Plant site, temporary construction worker camp, and other associated facilities (see Chapter 2 of the FEIS for details regarding these facilities. The JCLNG terrestrial wetland construction and permanent impacts are summarized in Table 2; wetland locations are shown in Figure 3. The Corps has reviewed and concurred with JCLNG's wetland delineation on March 13, 2014.

Most of the impacted wetlands would be permanently filled during construction, thereby severing any hydrologic connection between filled wetlands and the bay. As noted above, the material used to construct the upland portion of the JCLNG will all come from the JCLNG slip and access channel excavation.

TABLE 2 – **Wetlands Delineated on the JCLNG Site**

Wetland Delineation	Cowardin Wetland Class		Areas Affected By Construction (acres)	Areas Affected By Operation (acres)
Slip and Access Channel				
Eelgrass	E2AB		2.5	2.5
Intertidal (MHHW)	E2US		8.1	8.1
Shallow Subtidal	E1UB		3.3	3.3
Deep Subtidal a/	E1UB		15.4 a/	15.4 a/
		Subtotal	**29.3**	**29.3**
Construction Dock				
Intertidal	E2US		1.9	1.4
Shallow Subtidal	E1UB		0.2	<0.1
Eelgrass Habitat a/	E2AB		0.3 a/	0.0 a/
		Subtotal	**2.4**	**1.5**
LNG Liquefaction Site				
2013-4	PSS		0.3	0.3
2013-3	PSS		0.1	0.1
		Subtotal	**0.4**	**0.4**
Access /Utility Corridor				
Wetland C	PFO		0.2	0.2
Wetland E	PAB		1.0	0.2
2013-6	PEM		0.3	<0.1
2012-2	PSS, PEM		0.2	0.0
2013-1	PUB, PSS, PEM		<0.1	<0.1
2013-2 a/	PUB, PSS, PEM		<0.1 a/	<0.1 a/
		Subtotal	**1.79**	**0.53**
Construction Worker Camp				
Wetland APC-A2	E2EM		0.2	<0.1
Wetland APC-D	PEM		<0.1	<0.1
Coos Bay, below el. 746´ (MHHW)	E2UB		<0.1	<0.1
		Subtotal	**0.3**	**<0.1**
South Dunes Power Plant				
Wetland F a/; b/	PUB		0.9 a/; b/	0.9 a/; b/
Wetland G a/; b/	PUB		0.9 a/; b/	0.9 a/; b/
Wetland H (East)	PEM		<0.1	<0.1
Wetland H (West)	PEM		<0.1	<0.1
Wetland I (North)	PEM		0.3	0.3
Wetland I (South)	PEM		<0.1	<0.1
Wetland J	PEM		<0.1	<0.1
Wetland L	PEM		0.1	0.1
Wetland M	E2UB		0.2	0.2
2012-7	PEM		0.2	0.2
Coos Bay, below el. 746´ (MHHW)	E2UB		0.5	0.5
		Subtotal	**3.2**	**3.2**
Rail Spur Bridge Relocation				
2012-4	PEM		<0.1	<0.1
		Subtotal	**<0.1**	**<0.1**
Southwest Oregon Regional Safety Center				
Wetland A	PFO		0.2	0.2
Wetland B	PFO		0.4	0.4
		Subtotal	**0.6**	**0.6**
Impact Summaries				
		Total Wetland Impacts	**38.0**	**35.6**

Cowardin (1979) aquatic habitat classes: E2AB = intertidal estuarine aquatic bed; E2US = intertidal estuarine unconsolidated shore; E1UB = subtidal estuarine unconsolidated bottom; PSS = palustrine scrub-shrub; PFO = palustrine forested; PAB palustrine aquatic bed; PEM = palustrine emergent

Note that values may not sum correctly due to rounding. Acreages for wetlands are rounded to the nearest tenth of an acre; values below 0.1 acre are noted as <0.1.

a/ These areas are not included in the mitigation requirements, and no mitigation for these areas has been proposed by Jordan Cove.

b/ These are jurisdictional wetlands but do not require mitigation as these former mill waste treatment areas under an ODEQ closure plan.

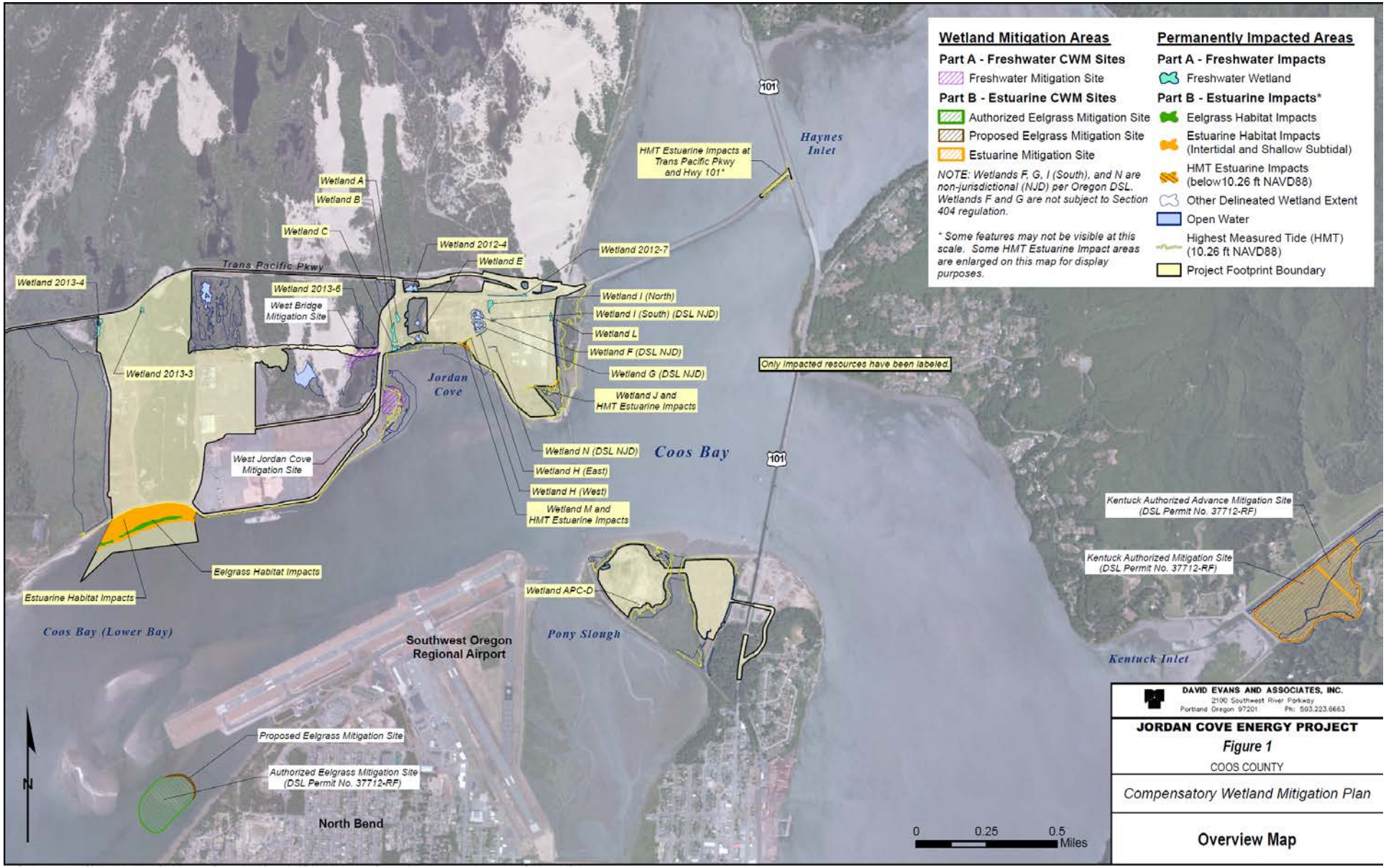

Figure 3. Delineation of Waters of the U.S. at the JCLNG and Proposed Compensatory Wetland Mitigation Sites.

2.2 PCGP Impacts. The proponent proposes to construct and operate an approximately 232-mile long, high-pressure, underground, welded steel, natural gas pipeline, and associated aboveground facilities (Figure 4). The pipeline would cross portions of Klamath, Jackson, Douglas, and Coos Counties, Oregon. For about 40 percent of its route (93 miles), the pipeline would be adjacent to existing powerlines, roads, and other pipelines with the remaining distance being newly created "green-field" right-of-way. The pipeline would be designed to flow natural gas from east to west, from its beginning point near Malin, Oregon, to the JCLNG terminal on Coos Bay.

Estimated wetland disturbances (from construction activities) and permanent wetland fills are summarized in Table 3. Numerous streams would be crossed by the PCGP; stream crossing information (nearest cleanup sites; type of waterbody; milepost, excavation methods, crossing dimensions, rationale for preferred crossing method; fisheries information; and contaminants information) is included in Attachment A at the end of this SDM.

TABLE 3 – **Summary of Wetland Impacts along the PCGP**

Wetland Type	Total Construction Disturbance in Wetland (acres)	Wetland Vegetation Affected by Fill or Located Within Permanent Operational Corridor (acres)	Wetland Impacts Considered by FERC to be a Long-Term Permanent Impact (acres)
Palustrine unconsolidated bottom and aquatic beds	6.3	0.0	0.0
Palustrine emergent wetlands	137.7	0.0	0.0
Palustrine forested wetlands	5.2	1.4	3.9
Palustrine scrub-shrub wetlands	1.2	0.1	1.1
Riverine wetlands	12.2	0.0	0.0
Estuarine	76.3	0.0	0.0
Lake	<0.1	0.0	0.0
Total Wetland Impact	**239.0**	**1.5**	**4.9**

Note that values may not sum correctly due to rounding. Acreages for wetlands are rounded to the nearest tenth of an acre; values below 0.1 acre are noted as <0.1.

a/ Includes wetlands that would be allowed to restore to preconstruction conditions (i.e., they would not be filled, nor would they be located within the permanent 10-foot-wide operational corridor); however, it could take many decades for conditions within these wetlands to restore to preconstruction conditions.

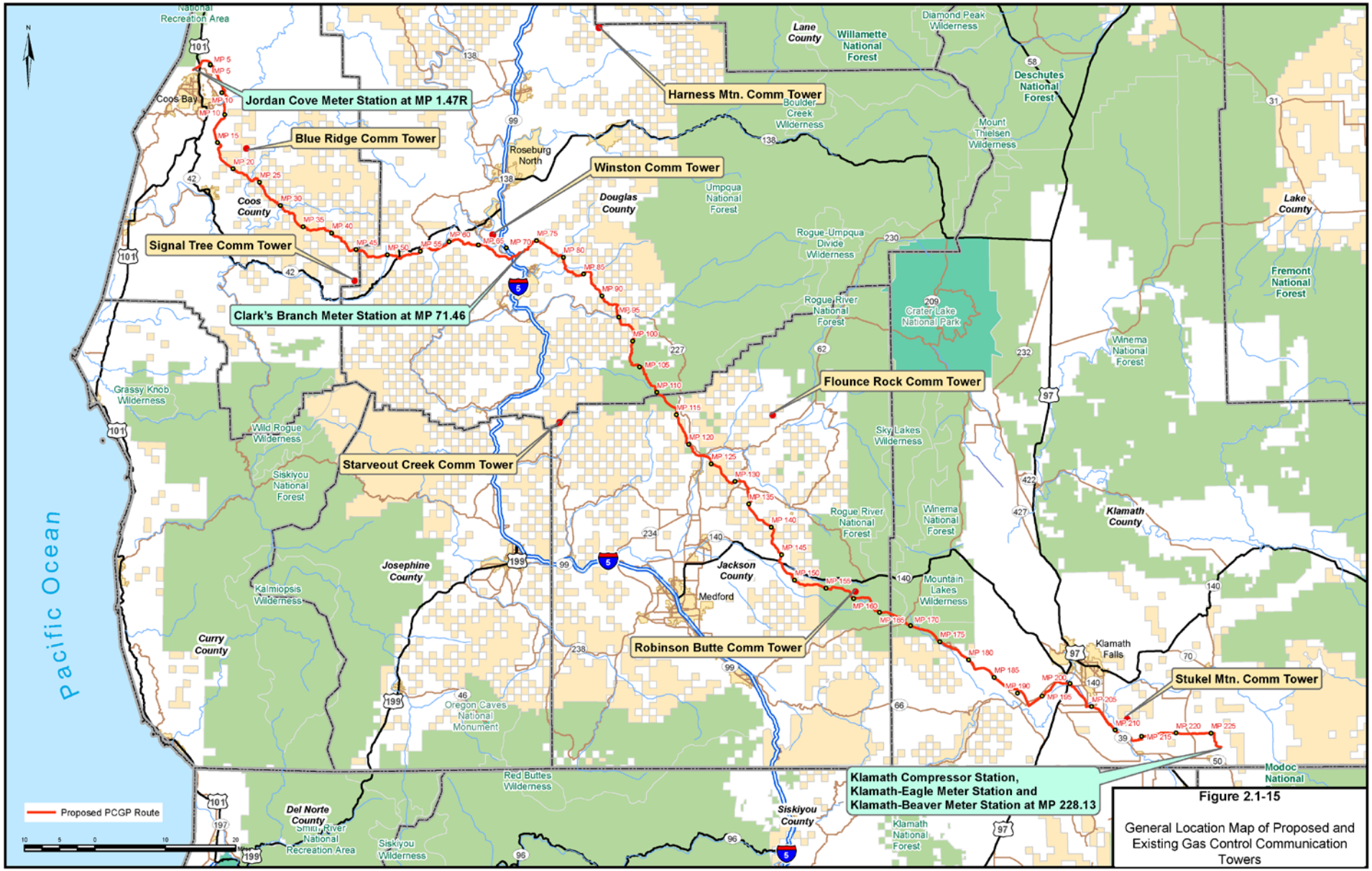

Figure 4. Pacific Connector Gas Pipeline Proposed Route.

2.3 Compensatory Mitigation for the JCLNG-PCGP.

JCLNG Mitigation – The proposed JCLNG mitigation sites appear in Figure 3. As part of its freshwater wetland mitigation proposal, Jordan Cove would include about 2.9 acres of wetlands at the West Jordan Cove mitigation site and about 1.6 acres of wetlands and the West Bridge Site, both located on the east side of the Roseburg Forest Products property. Impacts to estuarine wetland resources would be mitigated via the in-bay Eelgrass Mitigation Site and Kentuck Slough Mitigation Site for total of approximately 50.8 acres of mitigation. The in-bay Eelgrass Mitigation Site is located south of the airport's west runway. The Kentuck Slough Mitigation Site is located south of Glasgow, Oregon (Figure 5).

PCGP Mitigation – The PCGP plans to mitigate wetland impacts along the pipeline right-of-way (ROW) at the Kentuck Slough Mitigation Site. Eelgrass restoration is also planned along the pipeline ROW at the Haynes Inlet crossing. Within the southeast part of the former Kentuck Golf Course, the PCGP would enhance approximately 4.3 acres of degraded, freshwater pasture wetland in the southeast part of the site (Figure 5). The freshwater wetlands abut brackish-water wetlands (situated adjacent to the Kentuck Slough). PCGP would enhance the freshwater wetland area by changing the wetland type to freshwater, native forested wetland. Mitigation enhancement components include:

- Removal of manmade ditches and berms
- Reroute flow within the ditches via excavated channels
- Remove non-native vegetation
- Install elevated habitat berms
- Plant red alder and Sitka spruce and wetland understory shrubs and herbaceous species

The PCGP would minimize wetland impacts through the following measures:

- Construction efforts would be scheduled for drier seasons
- Hazardous materials, fuels, and oils would not be stored in a wetland or within 150 feet of a wetland
- The top 1 foot of topsoil would be segregated from the subsoil in the area disturbed by trenching, except where standing water is present or soils are saturated or frozen. Immediately after backfilling, the segregated soil would be restored to its original location
- Vegetation would be cut just above ground level to leave the existing root system in place. Tree stump removal and grading would occur directly over the trench line. Stumps would not be removed from the rest of the right-of-way unless required for safety reasons
- Construction equipment operating in the wetland would be limited to that needed to clear vegetation, dig trenches, install the pipe, backfill, and restore the right-of-way. Other equipment would use upland access roads to the maximum extent possible. Travel would be restricted across wetlands where topsoil was restored
- Low ground-weight equipment would be used in saturated wetlands or the normal equipment would be operated on prefabricated equipment mats
- Slope breakers and sediment controls would be installed and maintained on slopes greater than 5 percent that are less than 50 feet from a wetland
- Erosion control devices would be installed and maintained as necessary to prevent sedimentation and runoff from entering wetlands
- Trench breakers would be installed, or the bottom of the trench would be sealed as necessary, to maintain the original wetland hydrology

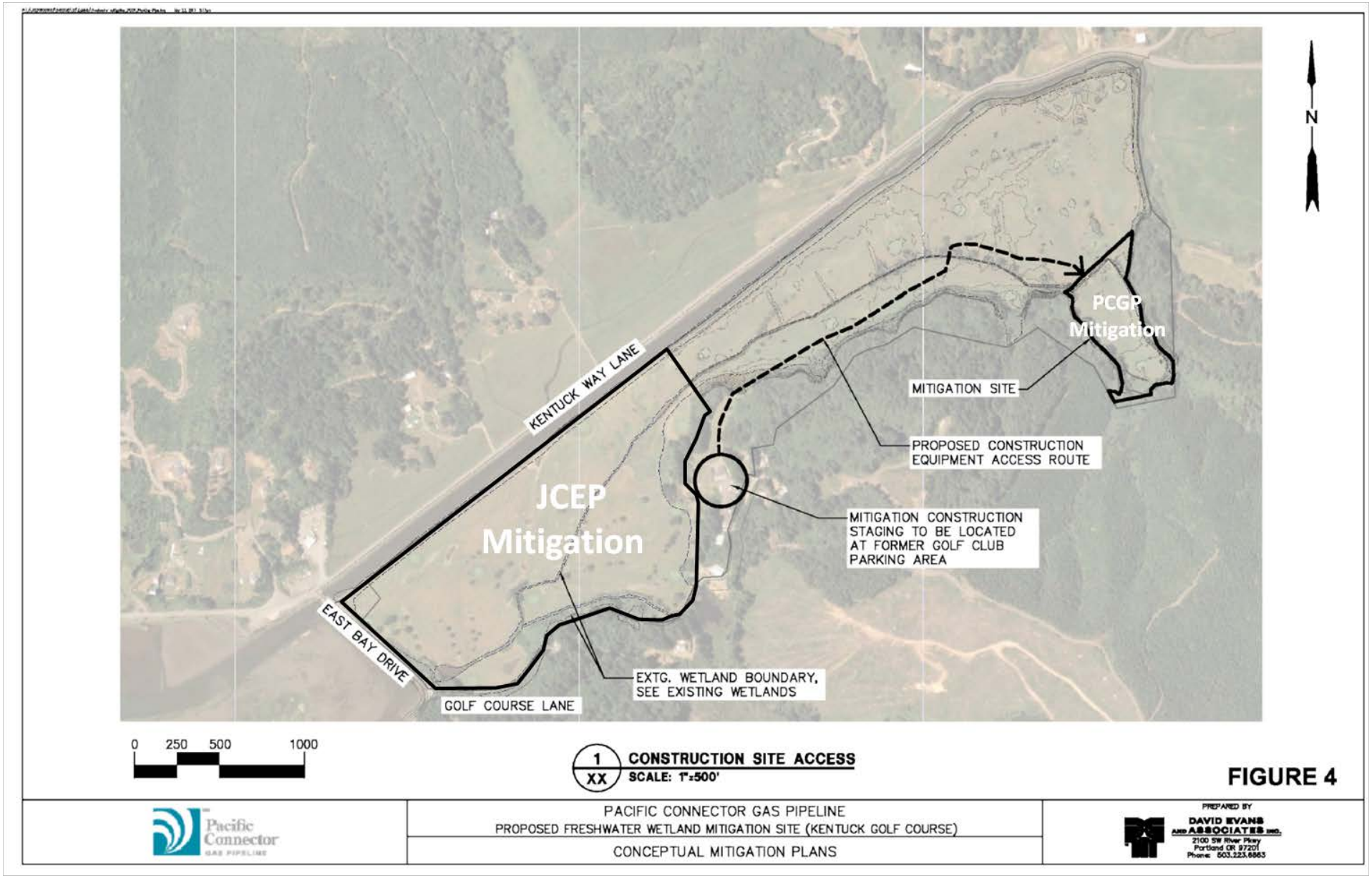

Figure 5. JCLNG and PCGP Compensatory Wetland Mitigation Areas at Kentuck Slough.

- Appropriate weed-free live seed mixtures would be used for revegetation. No fertilizers would be used in wetlands; native trees and shrubs would be replanted during restoration of wetlands within riparian areas
- Wetlands would be monitored after revegetation for 3 years after construction or until the revegetation is successful. Revegetation would be considered successful when 80 percent of the type, density, and distribution of species are similar to that of adjacent unaltered wetlands. If revegetation is not successful at the end of 3 years, Pacific Connector would develop and implement a remedial revegetation plan to actively revegetate the wetland and would continue revegetation efforts until wetland revegetation is successful
- Vegetation maintenance would not be conducted over the full width of the operational right-of-way within wetlands, but limited to a 10-foot-wide corridor

3.0 Level 1 Site History Information. Land use information appears in Section 4.1 of the FEIS. Environmental cleanup sites (identified in ODEQ's Environmental Cleanup Site Information [ECSI] database) for both the JCLNG and PCGP listed by pipeline milepost in Attachment A; ECSI sites in or near the JCLNG appear at the beginning of Attachment A.

3.1 JCLNG Site History Information

Land Use – Virtually all of the JCLNG upland elements are on privately owned lands. No federal lands would be utilized for the JCLNG. However, the JCLNG proposes to acquire one parcel from the Oregon International Port of Coos Bay (OIPCB). In addition, some components are situated within waters of the State of Oregon. The majority of the waterway for LNG vessel marine traffic, the access channel to the terminal, and the eelgrass mitigation area would be located in Coos Bay. The bay is considered waters of the State, with the bottom of the bay managed by DSL.

Historically, the LNG terminal tract was once part of the Henderson Ranch, dating back to the 1860s. In the 1880s, the Henderson Ranch was acquired by the Luse family, who later sold it to the Southern Oregon Improvement Company. Later, the Peterson family operated a dairy farm in the area in the early twentieth century, and continued to run cattle on the North Spit until the late 1950s. The terminal tract, then referred to as the Ingram Yard, was acquired by the Menasha Wood Ware Corporation, and was sold to Weyerhaeuser in 1981. The Ingram Yard was used for log sorting and disposal of debris from operation of the mill. In the early 1970s, the Corps deposited dredged material from the Coos Bay FNC at the Ingram Yard.

The site of the proposed North Point Workforce Housing Project (located on east of the airport on the south bank of Coos Bay, Figure 3) is owned by Al Pierce Lumber Company, and would be leased by Jordan Cove. It is zoned for heavy industry according to the North Bend Municipal Code and is classified as industrial land. The site is currently unoccupied and undeveloped. Previously, the site was used for dredged material disposal on the western portion and log storage on the eastern portion.

Due to the potential to encounter contaminated soils in the terrestrial parts (including terrestrial wetlands) of the LNG terminal site, JCLNG conducted multiple Phase I and Phase II environmental site assessments (ESAs). Phase I protocols consist of record searches, inventories, site visits, and other methods, but are not intrusive. Phase II protocols consist of intrusive sampling. Phase II ESAs were conducted to address the findings of the Phase I ESAs. Summaries of these ESAs appear in the FEIS, Section 4.3.1.3 (Soil Limitations).

Cleanup Sites – Cleanup sites in or near the JCLNG and their descriptions appear in Attachment A. Two sites were identified in the ECSI database: ECSI Site No. 1083 (Weyerhaeuser Mill Site) and ECSI Site No. 4704 (Weyerhaeuser Ingram Yard). Remedial actions at these sites are described in Attachment A. On 15 September 2006, both of these sites received a joint "No Further Action" letter from ODEQ's Cleanup Program. A work plan for full regulatory closure of these sites, providing full contaminant removal and/or containment, was also prepared by GRI (2013); key elements of the site closures are summarized in Attachment A.

The northern third of the Ingram Yard site contains ash and sludge with concentrations of polychlorinated biphenyls (Aroclors) detected at up to 89 µg/kg. Phthalates were also detected at concentrations well above the SEF marine SLs (e.g., bis-2-ethylhexyl-phthalate concentrations ranged from 2.7 to 4.9 mg/kg; the SEF marine SL is 1.3 mg/kg) (CH2MHill, 1996).

Prior Sediment Testing – The Corps has conducted physical and chemical characterization of Coos Bay FNC sediments since 1980. Sediment sampling near the JCLNG (between channel miles 6.0 and 9.0) occurred in 1989, 1998, 1999, 2005, 2010, and 2014. Physical analysis of sediment samples collected by the Corps indicates that the materials near the JCLNG are predominantly sands with varying amounts of gravel and silt. These grain-size data indicate that sediment near the project area is generally coarse-grained and are less likely to contain contaminants as compared to fine-grained sediments. The chemical analytical data from the Corps FNC indicate that chemicals of concern present near the project area generally include metals, phenols, various phthalates and PAHs.

Roseburg Forest Products (RFP) operates a marine terminal on the north side of the Coos Bay at channel mile 7.9, directly upstream of the proposed JCLNG marine slip and access channel. RFP's berth was evaluated in 1997; concentrations of semi-volatile organic compounds (SVOCs) and tributyltin (TBT) exceeded the regional sediment quality guidelines. Bioaccumulation testing was conducted on the project sediments and the sediments were considered suitable for unconfined, aquatic disposal. The berth was evaluated in 1999 and TBT results were similar to 1997; based on the 1997 bioaccumulation results, the sediments were determined to be suitable. The berth was evaluated in 2002 and again in 2005; TBT concentrations did not exceed the marine benthic toxicity screening level (SL1 = 0.15 ug/L, porewater) in either sampling event. The berth was tested in 2009 and TBT was detected above the SL1 in the west part of the berth; discrete re-sampling did not detect TBT and dredging was restricted to the eastern portion of the berth. RFP's berth was sampled again in 2010 and 2015; TBT was not detected during either sampling event, and the sediments were determined to be suitable for unconfined, aquatic disposal.

3.2 PCGP Site History Information.

Land Use – Approximately 64 percent of the land that would be crossed by the pipeline is classified as forest, 17 percent is agricultural land and 10 percent is rangelands. Water, wetlands, and barren lands comprise about 2 percent of the proposed route. Only 7 percent of the proposed right-of-way is composed of urban or built-up lands with varying uses.

North of Medford, Oregon, prospecting and exploration activities for mineral mercury (cinnabar) occurred on the Umpqua National Forest during the late 1920s through the early 1940s. A group of mercury mining claims is located along the PCGP ROW between MP 108.7 and 109.2 (Figure 6). The pipeline ROW cuts through the eastern unit of the Thomason group of mining claims; this unit was not known for producing substantial amounts of mercury. The principal mercury producer in the area was the Red Cloud mine, located west and southwest of the pipeline ROW. This property produced at least 6

flasks (and possibly as many as 63 flasks) of elemental mercury (quicksilver). Mercury was extracted by roasting the cinnabar-bearing vein material on-site (Broeker, 2010). Mercury sampling results from this area are summarized in Section 4.2, below.

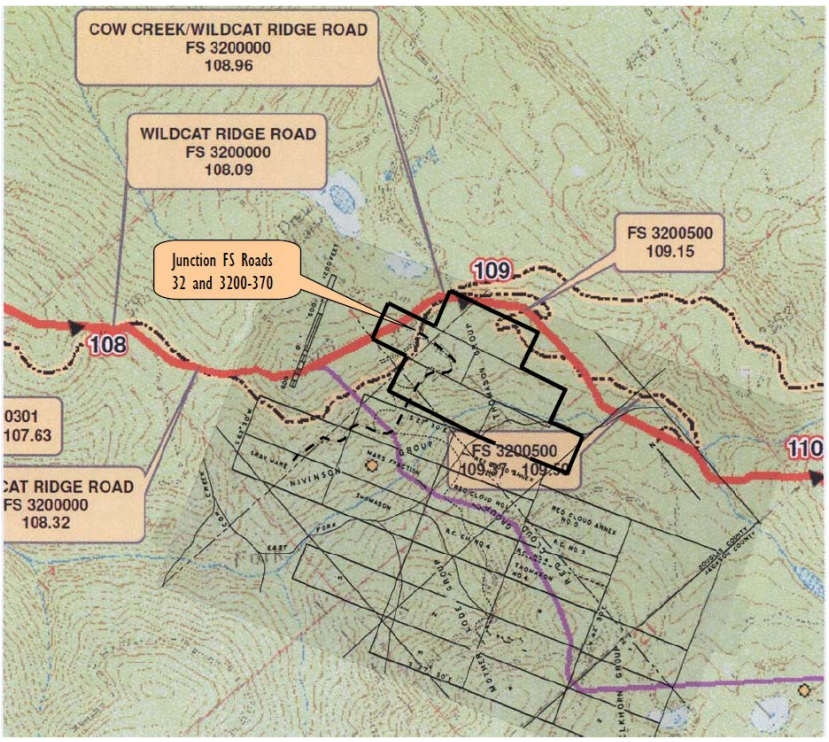

Figure 6. Thomason group of mining claims for mineral mercury, PCGP MP 109.

No known contaminated sites would be crossed by the pipeline; therefore, contact with contaminated soils during pipeline construction is not anticipated. Pacific Connector has developed a "Contaminated Substances Discovery Plan" that specifies measures that would be implemented if unanticipated, contaminated soils are encountered. Some of the measures outlined in that plan include:

- Ceasing all construction work in the immediate vicinity of areas if hazardous or unknown wastes are encountered
- Construction, oversight, and observing personnel would be evacuated to a road or other accessible up-wind location until the types and levels of potential contamination can be verified
- If an immediate or imminent threat to human health or the environment exists, one of PCGP's emergency response contractors or the National Response Team would be notified and mobilized

Cleanup Sites – ECSI Site No. 583, the Roseburg Forest Product's Hult Chip Yard, is located off the proposed pipeline ROW near MP 67; in 1985 approximately 8,000 gallons of fuel were released from a ruptured tank. Details of the cleanup appear in Attachment A.

ECSI Site No. 655, a former Weyerhaeuser sawmill (currently Collins Forest Products), is located south of the ROW near MP 198 (near Klamath Falls, Oregon). Contaminants identified at the site include arsenic, chromium, copper, mercury, polynuclear aromatic hydrocarbons, and petroleum hydrocarbons. Site details appear in Attachment A.

ECSI Site No. 2878, DG Shelter Products, is also near Klamath Falls, Oregon. This site, located near a portion of the Klamath River, was added to ODEQ's ECSI database for tracking purposes. Site screening was recommended and completed in 2001. Currently, there are no additional actions listed for the site. Other site details appear in Attachment A.
ECSI Site No. 2785, Mac's Store is located south of Klamath Falls, Oregon, in Klamath County, due east of MP 206.0. Due to a suspected underground fuel spill, the site was recommended for screening in 2001. ODEQ has determined that no further action is required to address contamination at the site. Other site details appear in Attachment A.

Prior Sediment Testing – Aside from cleanup site investigations along the PCGP (listed above), no other sediment sampling was noted in the FEIS.

3.3 JCLNG-PCGP Mitigation Site History Information.

Land Use – Land use for the West Jordan Cove and West Bridge freshwater mitigation sites is described in Section 3.1, above. The Kentuck Slough mitigation site was formerly a golf course and is located below the mean high water mark for Coos Bay. The site is maintained in the dry by the fill beneath East Bay Drive, which channelizes the slough to the northwest of the golf course. Kentuck Slough was originally a salt water marsh that was diked and filled between 1939 and 1961 for use for agriculture, logging, and gravel quarrying. The southeastern portion of the site that would be used to mitigate PCGP impacts consists of freshwater pasture wetlands. The golf course was built in the 1960s and is located adjacent to the Coos Bay Channel and Kentuck Slough. The golf course is not open and there are no plans to resume operation. Pesticides and herbicides were applied to the golf course in the past. Pesticides are no longer in use, but recent practice has been to use Round-Up, a glyphosate-based, broad-leaf herbicide for weed control.

Cleanup Sites – No cleanup sites were identified near either the Kentuck Slough or in-bay eelgrass mitigation sites. ECSI Site Nos. 1083 and 4704 (Weyerhaeuser Mill Site and Ingram Yard, respectively) are far removed from the West Jordan Cove and West Bridge freshwater mitigation sites; potential sources from these cleanup sites do not likely contribute contaminants to these proposed mitigation areas.

Prior Sediment Testing – No prior sediment testing has occurred at the Kentuck Slough mitigation site. Aside from sediment sampling in the adjacent Coos Bay FNC (see SDM Section 3.1), no sediment testing has occurred in or near the in-bay eelgrass mitigation site.

4.0 JCLNG-PCGP Sediment Characterization. Between 2006 and 2014, several investigations were conducted to characterize sediments in the in-water portions of the JCLNG-PCGP project; the results of these events are summarized below. Future requirements for sediment testing are described in Section 5.0 of this SDM.

4.1 JCLNG Sediment Characterization.

In-Bay Sampling, Access Channel and Marine Slip – In October 2006, SHN Consulting Engineers & Geologists, Inc. (SHN) sampled the bayward, estuarine sediments and subsurface sediments (physical characterization only) in the footprint of the JCLNG access channel and outer part of the marine slip. Twenty-one samples (representing approximately 1.9 mcy) were analyzed for grain size and total volatile solids (TVS); the samples were stratified throughout the berth and access channel). The sand content in all 21 samples was >99%; TVS ranged from 0.50 to 2.74% (SHN, 2007). Based on the physical results, no

chemical testing was required by the RMT, as documented in their 24 April 2007 suitability determination memorandum.

Sediment investigations at the cleanup sites identified near the JCLNG are described in Attachment A. Terrestrial site investigations are briefly summarized in Section 3.1, above.

4.2 PCGP Sediment and Soil Characterization

Haynes Inlet Pipeline Crossing – In June 2010, GeoEngineers collected three composite samples (composed of three subsamples) from along the Haynes Inlet pipeline crossing in the Coos Bay estuary (MP 1.7R to 4.1R). Metals, most SVOCs (including PAHs), pesticides, and PCBs were not detected; diethyl phthalate and bis(2-ethylhexyl)phthalate were detected at concentrations well below their respective marine SLs (GeoEngineers, 2010). The Haynes Inlet pipeline crossing sediment was determined to be suitable for unconfined, aquatic placement by the PRG on October 7, 2010.

Cow Creek Mercury Investigations – Because mercury mineral deposits are naturally-occurring throughout the area around MP 109, background concentrations are also elevated in soils and sediment. Three in-stream sediment samples were collected along the pipeline ROW, one from the East Fork of the Cow Creek and two from its tributaries, and analyzed for mercury and other heavy metals. Mercury concentrations ranged from 0.06 mg/kg to 0.29 mg/kg. The regional freshwater benthic toxicity screening level (SL) for mercury is 0.66 mg/kg. Soil mercury concentrations at the Red Cloud Mine (located >1,000 feet outside of the ROW) ranged from non-detect (detection limit = 0.02 mg/kg) to 60.1 mg/kg, nearly 100 times the SL (Broeker, 2010).

Sediment investigations at the cleanup sites identified along the PCGP are described in Attachment A. No other sediment investigations were provided along the length of the channel.

4.3 JCLNG-PCGP Mitigation Sites Sediment Characterization

West Jordan Cove and West Bridge Freshwater Mitigation Sites (JCLNG) – To our knowledge, these site sediments have not been chemically characterized.

Kentuck Slough Mitigation Site (JCLNG & PCGP) – The Kentuck Slough Mitigation Site was sampled in November 2010. The mitigation site was divided into four units, and four composite samples (composed of 3 subsamples each) were submitted for physical and chemical analysis (SEF full suite). Four samples from the intertidal channel were also submitted for physical and chemical analysis; dimethyl phthalate concentrations in one sample, C-5 (79 µg/kg), exceeded the marine SL (71 µg/kg) (GRI, 2011). In their SDM dated 1 June 2011, the PRG determined that channel sediments at sample location C-5 were unsuitable for unconfined, aquatic exposure; sediment characterized by other samples was determined suitable for unconfined, aquatic exposure.

Revisiting the November 2010 Kentuck Slough data, GRI believed that sample C-5 was contaminated with phthalates by the gloves used during sample processing. To provide a weight-of-evidence to support their supposition, GRI resampled the area around point C-5 in September 2014. One surface and one subsurface sample were collected from station C-5; surface and subsurface samples were collected from two stations directly adjacent to station C-5. The 6 samples were submitted for phthalates analysis (samples were not composited). No phthalates were detected in the re-analysis and all detection limits were below the respective marine SLs (GRI, 2014a). In this SDM, the PSET has determined that the channel material at station C-5 is suitable for unconfined, aquatic exposure (along with the rest of the channel).

JCLNG proposed to expand the Kentuck Slough Mitigation Site to include an unnamed pond south of Golf Course Lane (and south of the mitigation site). In September 2014, the pond was sampled for physical parameters and the full suite of SEF chemicals of concern. Though chemicals of concern were not detected during this investigation, method detection limits were well above the SEF marine SLs for the following compounds (GRI, 2014b):

- Dieldrin
- n-Nitrosophenylamine
- Hexachlorobutadiene
- Benzyl alcohol
- Benzoic acid
- 1,2-Dichlorobenzene
- 1,2,4-Trichlorobenzene
- Hexachlorobenzene
- 2-Methylphenol
- 2,4-Dimethylphenol
- Pentachlorophenol

According to the SEF, if a chemical of concern is not detected by the laboratory, and the method detection limit is elevated above the screening level, then the material is determined to be unsuitable for unconfined, aquatic exposure. In this case, the method detection limits for 11 compounds were elevated above their respective screening levels. GRI's contract laboratory believes that the method detection limits were elevated due to the high total organic carbon content measured in the pond sediments. The PSET has determined that the pond sediments are not suitable for unconfined, aquatic exposure. Biological (bioassay) testing is required to further evaluate the suitability of these sediments.

The PCGP portion of the Kentuck Slough Mitigation Site has not been sampled or tested. However, it is similar to the JCLNG portion of the Kentuck Slough Golf Course. Given the limited amount of ground disturbance proposed for the PCGP, the PSET will not require additional testing for this area.

Eelgrass Mitigation Site (JCLNG) – The Eelgrass Mitigation Site was sampled by GRI in December 2010. Due to the sandy nature of material in the lower part of the estuary, physical screening was approved for this sediment characterization. Three subsamples were composited from the proposed mitigation site; the composite sample was analyzed for total solids (77%), total organic carbon (0.36%), and grain size distribution. The sediment was composed of approximately 90% sand and 10% fine-grained material; the sand fraction was predominantly fine sand (62% of the sample was composed of sands 0.125 to 0.25 mm in diameter). No additional characterization is required for this mitigation site.

Pipeline ROW Eelgrass Restoration – Eelgrass from adjacent donor sites will be used to restore eelgrass habitat along the pipeline ROW through Haynes Inlet. Pipeline sediments are suitable for aquatic exposure. No additional testing for eelgrass restoration was required by the PSET.

5.0 Management Area Rank, Data Recency, and Need for Re-Evaluation. The management area rankings and the recency of data for in-water components of the JCLNG-PCGP project are summarized in Table 4. The need for sediment re-evaluation is also documented in this table, along with supporting rationale. Upland sediments were only ranked if the material would be discharged into a water of the U.S. (as in the JCLNG fill).

If constructed, the JCLNG access channel and marine slip must be sampled prior to the first round of maintenance dredging. This area will be initially ranked "low"; the rank may change depending on the results of the first round of sediment characterization.

TABLE 4 - **SEF Management Area Rankings for the JCLNG-PCGP Project**

Project Component	Management Area Rank	Recency of Data	Re-Evaluation Date*	Rationale
Jordan Cove LNG				
In-bay Access Channel and Marine Slip (1.9 mcy)	Very Low/ Low (after construction)	10 years/ 7 years	October 2016 a/ Prior to 1st maintenance	Grain size data from the project site and no deep draft vessel usage support this rank determination.
Terrestrial Excavation of Marine Slip (3.7 mcy)	Low-Moderate	Not sampled	Not required b/	Per GRI's 2013 work plan, sources of contamination from the Weyerhaeuser Mill Site and Ingram Yard will be managed at an onsite landfill or removed to a DEQ-regulated landfill. Since contaminated sediment management is planned for the upper veneer of soil at the Ingram Yard site, the bulk of the material to be excavated and used onsite will likely be composed of uncontaminated, native sediment. Further, this excavated material will be placed in uplands and terrestrial wetlands and not provided with a direct hydrological connection to Coos Bay.
Pacific Connector Gas Pipeline				
Haynes Inlet (MP 1.7R to 4.1R)	Low	7 years	June 2017 c/	Sediment chemical results and the fine-grained nature of these sediments support this rank determination.
Stream Crossings – Historical Mercury Mining Area (MP 108.8 to 109.5)	Moderate	5 years	Not required d/	The occurrence of elevated concentrations of mercury near MP 109 supports this rank determination.
Stream Crossings – Remainder of PCGP (4.1R to 228.1)	TBD (varies)	Not sampled	Not required d/	Sampling (and ranking) will only be required if sources of contaminants are identified at stream crossings and the dissolved and suspended phases cannot be contained or managed.
JCLNG-PCGP Mitigation				
West Jordan Cove and West Bridge Mitigation Sites (JCLNG)	Low-Moderate	Not sampled	Not required	These terrestrial wetlands have no direct hydrological connection to the Coos Bay. Sources of contamination are far removed from these wetlands, and so risk of contamination is low. Sampling is not required.
Kentuck Slough Mitigation Site (JCLNG & PCGP)	Low	7 years	September 2021 c/	Sediment chemical results and the fine-grained nature of these sediments support this rank determination. Includes both the JCLNG and PCGP parts of the mitigation site.
Kentuck Slough Pond (JCLNG)	Moderate	5 years	September 2019 c/	Sediments are unsuitable for unconfined, aquatic exposure; bioassay testing must be conducted to support aquatic exposure of this material. Or, the contract laboratory must attain analytical detection limits below the marine SLs.
Eelgrass Mitigation Site (JCLNG)	Very Low	10 years	December 2020 c/	Grain size data from the project site and no deep draft vessel usage support this rank determination.
Eelgrass Restoration – Pipeline ROW (PCGP)	Low	7 years	Not required e/	Restoration of eelgrass beds along pipeline ROW; installation of eelgrass plugs from nearby donor sites.

* The need to resample must be evaluated prior to this date. If project conditions have not changed and new sources of contaminants have not been identified, then the PSET may extend the resample date. Conversely, if new contaminant sources are identified in or near the project area, additional sediment testing may be required prior to construction.

a/ Re-evaluation of the in-bay sediments is not required if the project is constructed before the listed date. However, if the slip is constructed, routine characterization of the shoaling material will be required prior to the first round of maintenance dredging. If new contaminant sources are identified in or near the project area, additional sediment testing may be required prior to construction.

b/ Sediment testing is not required for the terrestrial fills proposed for the JCLNG wetlands due to the low existing sediment contaminant levels in the wetlands, the ability of contaminants to migrate to abutting or adjacent water bodies, and proposed capping of sediments with supplemental clean fill material and impervious surfaces. If the slip is constructed, routine characterization of the shoaling material will be required prior to the first round of maintenance dredging.

c/ Re-evaluation of the in-bay sediments is not required if the project is constructed before the listed date. If new contaminant sources are identified in or near the project area, additional sediment testing may be required prior to construction.

d/ Sampling may be required if contaminant sources are identified in or near stream crossings, and suspended and dissolved contaminants cannot be managed. 40 CFR §230.60(c) states: "Where the discharge site is adjacent to the extraction site and subject to the same sources of contaminants, and materials at the two sites are substantially similar, the fact that the material to be discharged may be a carrier of contaminants is not likely to result in degradation of the disposal site. In such circumstances, when dissolved material and suspended particulates can be controlled to prevent carrying pollutants to less contaminated areas, testing will not be required." Material excavated to form the pipeline trench is used in the same area to bury the pipeline. Pipeline construction best management practices listed in the FEIS would ensure that "…dissolved material and suspended particulates [are] controlled to prevent carrying pollutants to less contaminated areas."

e/ Planned restoration activities are minimally invasive and do not require sediment testing.

6.0 Suitability Determination. Table 5 documents the suitability of the JCLNG-PCGP project sediments for unconfined, aquatic disposal or exposure. The need to re-test project sediments is summarized in Table 4, above.

TABLE 5 – **Suitability Determinations for the JCLNG-PCGP Project**

Project Component	Suitability Determination	Notes
Jordan Cove LNG		
In-bay Access Channel and Marine Slip (1.9 mcy)	Suitable	This material is suitable for offsite disposal.
Terrestrial Excavation of Marine Slip (3.7 mcy)	Suitable and Unsuitable Materials	The bulk of the material from the Ingram Yard is likely suitable. Only the upper veneer of soil has the potential to contain contaminants at concentrations of concern, and these will be managed during the regulatory closure process. The bulk of the material to excavated and used onsite is composed of native sediment that is likely uncontaminated. Wetlands filled by these sediments would be obliterated, and their hydrological connections severed from the Coos Bay estuary. Any residual contamination present in these excavated sediments would be effectively capped by impermeable surfaces associated with the LNG terminal.
Pacific Connector Gas Pipeline		
Haynes Inlet (MP 1.7R to 4.1R)	Suitable	Although this material would be redeposited at the point of origin, it is also suitable for offsite disposal
Stream Crossings – Historical Mercury Mining Area (MP 108.8 to 109.5)	Suitable for excavation and discharge at the excavation site	Offsite discharge of this material into waters of the U.S. is not allowed without additional sediment characterization.
Stream Crossings – Remainder of PCGP (4.1R to 228.1)	Suitable for excavation and discharge at the excavation site	Offsite discharge of this material into waters of the U.S. is not allowed without additional sediment characterization.
JCLNG-PCGP Mitigation		
Kentuck Slough Mitigation Site	Suitable	Sediments are suitable for unconfined, aquatic placement within the JCLNG and PCGP restoration project areas; channel sediments are suitable for unconfined, aquatic exposure.
Kentuck Slough Pond	Not Suitable	Laboratory detection limits were elevated above the marine SLs of 11 compounds; though reported as “non-detects” the material is assumed to be unsuitable. If detection limits below the SLs were attained, then the PSET would evaluate the new data.
Eelgrass Mitigation Site	Suitable	Sediments are suitable for unconfined, aquatic placement within the restoration project area; onsite sediments are suitable for unconfined, aquatic exposure.
Eelgrass Restoration – Pipeline ROW	Suitable	Material from the pipeline will be redeposited at the point of origin; eelgrass plugs from donor sites do not require sediment evaluation.

7.0 Reviewers

The reviewers of this project included:

☑ James McMillan (Corps, Lead) ☑ Bridgette Lohrman (EPA, Co-Lead)
☑ James Holm (Corps) ☑ Pete Anderson (ODEQ) ☐ Laura Inouye (Ecology)
☑ Tom Hausmann (NMFS) ☐ Jeremy Buck (USFWS)

This memorandum was prepared by James McMillan (PSET Lead), and reviewed by the participating PSET agencies, identified above. Questions regarding this memorandum should be directed to James McMillan at (503) 808-4376 or e-mail to: james.m.mcmillan@usace.army.mil.

8.0 References

U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, Washington Department of Ecology, Washington Department of Natural Resources, Oregon Department of Environmental Quality, Idaho Department of Environmental Quality, National Marine Fisheries Service, and U.S. Fish and Wildlife Service. 2009. *Sediment Evaluation Framework for the Pacific Northwest*. Published May 2009, by the U.S. Army Corps of Engineers, Northwestern Division, 128 pp + Appendices.

9.0 Project Documents Reviewed by the PSET

The PSET reviewed the following documents for this sediment evaluation:

JCLNG Documents

- 1 October 1996 "Phase II – Ingram Site Investigation, North Bend, Oregon" prepared by CH2MHill
- 15 September 2006 "No Further Action Determination, Former Weyerhaeuser Containerboard Mill, North Bend, Coos County, Oregon," prepared by ODEQ (includes the "Mill Site" and "Ingram Yard")
- January 2007 "Sediment Sampling and Analysis Report: Oregon Gateway Marine Terminal, Coos Bay, Oregon," prepared by SHN Consulting Engineers & Geologists, Inc.
- 3 July 2013 "Revised Work Plan for Joint Program Regulatory Closure: Settling Basins, Petroleum-Contaminated Soil, Asbestos Waste, and Mill Waste, Former Weyerhaeuser Mill Site and Ingram Yard Properties," prepared by GRI

PCGP Documents

- 23 August 2007 "Mine Hazards Evaluation and Mercury Testing at the Red Cloud, Mother Lode, Nivinson, and Elkhorn Mining Groups, Jackson and Douglas Counties, Oregon" and 2 October 2009 addendum, prepared by GeoEngineers
- 7 October 2009 "Level 1 Sediment Quality Assessment: Pacific Connector Gas Pipeline Project, Haynes Inlet, Oregon," prepared by GeoEngineers; this report includes summaries of Corps of Engineers sampling events conducted in 1980, 1990, 1993, 1994, 1998, and 2005
- 3 February 2010 "Potential for natural-occurring mercury mineralization to enter the aquatic environment between M.P. 109 and East Fork Cow Creek – Williams' Pacific Connector Gas Pipeline Project," prepared by L. Broeker, Consultant Geologist, Umpqua National Forest
- 2 August 2010 "Sediment Characterization: Pacific Connector Gas Pipeline Project, Haynes Inlet, Oregon," prepared by GeoEngineers
- January 2013 "Contaminated Substances Discovery Plan, Pacific Connector Gas Pipeline Project," prepared by Pacific Connector Gas Pipeline, LP

Mitigation Site Documents

- 7 January 2011 "Sediment Characterization Report: Eelgrass Mitigation Site," prepared by GRI
- 8 February 2011 "Sediment Characterization Report: Wetland Mitigation Site, Coos Bay, Oregon" (Kentuck Slough mitigation site), prepared by GRI

- May 2013 “Pacific Connector Gas Pipeline Compensatory Wetland Mitigation Plan” prepared by David Evans and Associates, Inc., for PCGP
- December 2013 “Estuarine Wetland/Open Water Restoration Plan: Pacific Connector Gas Pipeline Project, Coos Bay Estuary,” prepared by Ellis Ecological Services, Inc., for PCGP
- April 2014 “Jordan Cove Energy Project – Compensatory Wetland Mitigation Plan” prepared by David Evans and Associates
- 24 October 2014 “Addendum 2 – Channel Resample Sediment Characterization Report, Kentuck Slough Wetlands Mitigation Site, Jordan Cove LNG Project, Coos Bay, Oregon,” prepared by GRI
- 13 November 2014 “Small Pond Embankment Modification Sediment Characterization Report, Kentuck Slough Wetlands Mitigation Site,” prepared by GRI

National Environmental Policy Act Documents

- 14 November 2014 Public Notice No. NWP-2012-441, for the JCLNG-PCGP Project issued by Portland District Regulatory Branch
- November 2014 *Jordan Cove Energy and Pacific Connector Gas Pipeline Draft Environmental Impact Statement* (DEIS) prepared by the Federal Energy Regulatory Commission
- September 2015 *Jordan Cove Energy and Pacific Connector Gas Pipeline Final Environmental Impact Statement* (FEIS) prepared by the Federal Energy Regulatory Commission

ATTACHMENT A

TABLE OF LEVEL 1 SITE HISTORY INFORMATION AND
STREAM CROSSING INFORMATION FOR THE
JORDAN COVE LNG
AND
PACIFIC CONNECTOR GAS PIPELINE

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information												
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**	
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**	
ECSI Site 1083 (Mill Site)	Upland	JCLNG	ECSI Site 1083 - The former mill complex consisted of a main mill/paper machine building, shipping warehouse and maintenance/operations buildings, several other buildings used for office space, shops, storage, and other purposes, and related improvements and infrastructure. The developed portions of the facility occupied the north central portion of the property, and the southern portions are undeveloped and consist of vegetated open spaces, stream channels, and shoreline/tidal flat areas along Coos Bay. Most site structures have been removed to ground level as part of mill decommissioning. Surface features such as concrete slabs have been left in place. Prior to construction of the mill, the area in the immediate vicinity of the mill was covered with low brush and grass. The vegetation was stripped and the area covered with several feet of dune sand to raise the elevation above high tide and flood levels. South of the building, toward Jordan Cove, large amounts of driftwood and vegetation were left in place and covered with fill sand to create a log storage yard. The mill site was originally developed as a sulfite process pulp and paper mill by the Menasha Wooden Ware Corporation (Menasha) in 1961, and Weyerhaeuser acquired the mill from Menasha in 1981. In 1995, Weyerhaeuser ceased pulp mill operations, and the facility was operated as a 100 percent recycle paper mill until it was closed in 2003. Since 2003, Weyerhaeuser has been decommissioning the facility and preparing the property for future alternative uses and possible sale. Weyerhaeuser leased the property east of the main mill area between the railroad tracks and Coos Bay to a fish hatchery operation that existed from approximately 1980 to 1992. Structures and improvements associated with the former hatchery operation included the fish hatchery structure, four buildings, and an above-ground storage tank (AST) for diesel storage. The fish hatchery improvements have been removed, and the property is currently vacant and undeveloped. Additional details concerning the site including the physical setting, hydrogeology, and operational history can be found in the document entitled Level II Environmental Site Assessment, Former Weyerhaeuser Containerboard Mill (PES, 2006). Additional details concerning the Ingram Yard parcel referred to in the Level II report are located under ECSI #4704. On 8/23/90 an expansion joint on a fuel line north of the Recovery Plant ruptured, resulting in oil spillage within the sand containment area surrounding the fuel tanks. The line failure was due to new fuel pumps, which exerted a higher pressure on the line than the expansion joint was equipped to handle. During the cleanup, it was found that the sump surrounding the pumps had been leaking oil for an extended period of time. The opening of the sump has been sealed (until permanent repairs are finished). With DEQ advice, several points around the sump were excavated to determine the direction and depth of the plume. The penetration appeared to extend to a depth of about four feet and flowed in an easterly direction. Contaminants detected during investigative work over the years have included: mineral spirits, hydraulic oil, diesel, heavy-oil-range petroleum hydrocarbons (total petroleum hydrocarbons, or "TPH"), heavy metals, butylated tin compounds, polynuclear aromatic hydrocarbons, polychlorinated biphenyls, and dioxins. Existing site grades will be raised a minimum of 3 ft with clean structural fill consisting of sand from the new slip to be excavated on the Ingram Yard property. Development over the existing mill wastewater system settling basins will require over-excavation of geotechnically unsuitable (highly organic) sludge in the basins and replacement with clean, compacted structural fill. Areas where structures will be seismically designed to minimize settlements will require ground improvement to a depth of about 35 ft below existing site grades to increase the density of the loose to medium dense sand fill. Methods of ground improvement have not been selected, but could include dynamic compaction or vibro compaction. Material from the onsite settling basins will be dewatered and transported to an open area in the Cell 3 landfill for temporary disposal. the Cell 3 landfill will be covered with a minimum 18 in. of clean sand as an interim measure pending final closure of the landfill. The surface of the solids cake area will be sloped to drain away from the center of the landfill. Spoil from the ground improvement activities in the lowerator and mineral release area will be managed as petroleum-contaminated soil and transported off-site to an approved DEQ-regulated facility. For asbestos containing material (ACM), a minimum of 3 ft of clean sand will be placed over the area with ACM. Any ground improvement completed in the ACM area will likely be completed with dynamic compaction with wet working area; Any ACM excavated will be double bagged in accordance with DEQ asbestos regulations and temporarily disposed of as allowed by permit in landfill Cell 3, or transported to an approved off-site facility. ACM placed in Cell 3 will be covered with a minimum 18 in. of clean sand as an interim measure pending final closure of the landfill.									
ECSI Site 4704 (Ingram Yard)	Upland	JCLNG	Weyerhaeuser evaluated environmental conditions at the Ingram Yard property as part of their Containerboard (ECSI #1083) facility closure and decommissioning process. (The investigation for this site was completed as a part of the former Weyerhaeuser North Bend Containerboard Mill closure work, and the various reports for the Ingram Yard are kept in the file for ECSI #1083). Areas of concern were identified by reviewing data from past environmental assessment work, observations of current site conditions, DEQ's strategy recommendation (including a list of areas DEQ recommended for evaluation), Weyerhaeuser's knowledge of past practices, and the findings of a recent Level I Environmental Site Assessment (ESA) report. A preliminary scope of work for a Level II investigation to evaluate the Ingram Yard was provided to and approved by DEQ during April and June 2005. As a part of their Level II investigation, Weyerhaeuser conducted a screening level human and ecological risk assessment of residual contamination present in surface soils at the Ingram Yard. The report concluded that residual contaminants do not exceed DEQ's acceptable risk levels. DEQ considers the investigation the Ingram Yard to be complete and recommends that, unless new or previously undisclosed information becomes available which warrants further investigation, no further action is required at the Ingram Yard under ORS 465.200, et. seq. **However, while surface soils at the Ingram Yard site meet human health and ecological screening criteria, they contain low levels of potentially bioaccumulating chemicals and must not be placed in waters of the state.** The log yard sort debris will be managed as permitted non-hazardous solid waste. The debris will be excavated and removed by truck to the Mill Site landfill Cell 3 for temporary disposal. Sludge at the Ingram Yard will be managed as permitted non-hazardous solid waste. The sludge in the area of the slip and below the footprint of planned industrial facility on and adjacent to Ingram Yard will be excavated and placed in a new soil berm to be constructed adjacent to the rail line along the northernmost portion of Ingram Yard. The sludge in the soil berm will be capped with a minimum of 2 ft of clean sand from the slip excavation. Any excess sludge will be relocated by truck back to the Mill Site landfill Cell 3 for temporary disposal and capped with a minimum 18 in. of clean sand as an interim measure pending final closure of the landfill.									
Coos Bay	Estuary	2.92R	12845.19	29496.36	Wet Open-Cut	Wet open cut only feasible practical in bay crossing method	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, migration, rearing habitat T, CH	Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	4 Coastal Pelagic spp., 21 Groundfish spp, 2 Salmonid spp. Pelagic, Groundfish, and Salmonids (see Table 3B-6)	Oct 1 to Feb 15	--	--	--
Trib. to Coos Bay (GSI026)	Intermittent Minor	4.89R	5.74	11.91	Dry Open-Cut	Dry open-cut method feasible/practical on small intermittent headwater tributary if flowing at time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib to Kentuck Slough (EE004/GW27)	Intermittent Intermediate	6.23R	12.93	26.82	Dry Open-Cut	Dry open-cut method feasible/practical on small intermittent ditched tributary if flowing at time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
Kentuck Slough (EE005/GSP-28)	Perennial Intermediate	6.28R	61.74	128.05	Conventional Bore	Dry open-cut methods likely feasible using coffer dams/diversions based on flow, channel size (depth and width). Conventional bore feasible based on width and depth; however extensive dewatering requirements expected because of anticipated groundwater conditions. Local traffic encumbrances would be avoided with boring methods. An HDD is like probable, based on topography, and expect geotechnical conditions, but likely not along the same alignment because of geometry requirements associated with large diameter pipe. Significant HDD costs, HDD time requirements were the determinants for the proposed conventional bore.	Oregon Coast ESU Coho, migration, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trib to Coos Bay (NW-117/EE06)	Perennial Major	6.35R	544.60	847.15	Dry Open-Cut	Dry open-cut method feasible/practical on small channelized tributary within golf course lacking effect riparian vegetation.	Oregon Coast ESU Coho, assumed habitat T	Coho Assumed, Winter Steelhead	Coho Assumed	Jul 1 to Sep 15	--	--	--
Willanch Creek (Denied Access 01)	Intermittent Minor	7.99R	3.00	6.22	Dry Open-Cut	Dry open-cut method feasible/practical on small headwater tributary, if flowing at the time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
Willanch Slough (EE007)	Perennial Intermediate	8.34R	14.07	29.18	Dry Open-Cut	Dry open-cut method feasible/practical on small tributary within pasture/hayfield lacking effect riparian vegetation.	Oregon Coast ESU Coho, migration, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trib to Willanch Slough (GDX029/EE008)	Perennial N/A	8.43R	-	-	Not Crossed by Centerline	Not crossed by centerline (likely intermittent – headwater trib.)	Oregon Coast ESU Coho, migration, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trip to Willanch Slough (GDX030)	Intermittent Intermediate	8.48R	12.84	26.63	Dry Open-Cut	Dry open-cut method feasible/practical on small intermittent channelized tributary on edge of pasture.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Willanch Slough (GDX031)	Intermittent Intermediate	8.49R	49.89	103.48	Dry Open-Cut	Dry open-cut method feasible/practical on small intermittent tributary if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Tributary to Coos River (GW34)	Intermittent N/A	9.55R	-	-	Adjacent to centerline within ROW	Not crossed by centerline (likely intermittent – headwater trib.)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Cooston Channel (Echo Creek) (SS-100-002)	Intermittent Intermediate	10.22R	79.88	165.68	Dry Open-Cut	Dry open-cut method feasible/practical on small headwater tributary, if flowing at the time of construction.	Oregon Coast ESU Coho, spawning habitat T, CH	Winter Steelhead Coho	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Coos River (SS-001-003)	Intermittent N/A	10.79R	-	-	Adjacent to centerline within ROW	Not crossed by centerline (intermittent – headwater trib.)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Coos River (BSP119)	Perennial Major	11.13R	-	-	HDD [10] Level 1 [11]	HDD feasible based on geometry, topography, and geotechnical conditions along proposed alignment. Primary HDD activities are significantly set back from crossing. Conventional bore not feasible/practical because of crossing length and high groundwater areas on either side of river. Dry open-cut or diverted open-cut methods not practical/feasible based on flow volumes and tidal influence.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, migration, rearing habitat T, CH	Fall Chinook, Coho, Winter Steelhead, Green Sturgeon, Pacific Lamprey	Chinook, Coho Pelagic, Groundfish, (see Table 3B-5)	Oct 1 to Feb 15 [10]	--	--	--
Vogel Creek (SS-100-005)	Perennial Intermediate	11.53R	34.52	71.60	Dry Open-Cut	Dry open-cut method feasible/practical on 45-foot wide waterbody during low flow period within fish window. Low gradient waterbody will minimize flow volumes that require management during crossing. Impacts to riparian vegetation minimized by placement/setbacks of TEWAs on edges of waterbody in field. Conventional bore crossing method avoided because of high groundwater present on either side of waterbody.	Oregon Coast ESU Coho, spawning habitat T, CH	, Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Vogel Creek (SS-100-005	Perennial N/A	11.58R	-	-	Adjacent to centerline within ROW	Not crossed by centerline. HDD pull back crossing will occur on rollers across small 10-foot wide ditched waterbody	Oregon Coast ESU Coho, spawning habitat T, CH	, Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Coos River ((SS-100-006)	Perennial Minor	11.77R	8.78	18.21	Dry Open-Cut	Dry open-cut method feasible/practical on small ditched tributary in pasture, if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Lillian Creek (SS-100-007)	Perennial Minor	11.91R	8.38	17.38	Dry Open-Cut	Dry open-cut method feasible/practical on small ditched tributary, if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Lillian Creek (SS-100-002a)	Perennial Intermediate	12.07R	86.00	178.37	Dry Open-Cut	Dry open-cut method feasible/practical on 80-foot wide trapezoidal channeled waterbody during low flow period within fish window. Low gradient waterbody will minimize flow volumes that require management during crossing. Impacts to riparian vegetation minimized by placement/setbacks of TEWAs on edges of waterbody in field. Conventional bore crossing method avoided because of high groundwater present on either side of waterbody.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, migration, rearing habitat T, CH	Coho, Winter Steelhead, Green Sturgeon	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Coos River (SS-100-008)	Intermittent Intermediate	12.22R	18.16	37.67	Dry Open-Cut	Dry open-cut methods feasible/practical on small ditched tributary in pasture.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Coos River (BDX109)	Intermittent Minor	8.67	5.72	11.86	Dry Open-Cut	Dry open-cut methods feasible/practical on small ditched tributary	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Coos River (BDX109a)	Intermittent Minor	8.73	4.45	9.23	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater tributary. No additional workspace required within forested wetland.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP104)	Perennial Minor	9.02	2.33	4.83	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide headwater tributary. No additional workspace required.	Oregon Coast ESU Coho, assumed habitat T,	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP105)	Perennial Minor	9.19	2.83	5.87	Dry Open-Cut	Dry open cut methods feasible/practical on small 2-3' wide waterbody.	Oregon Coast ESU Coho, assumed habitat T,	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (DSI003)	Intermittent Intermediate	9.33	11.72	24.31	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction. No additional workspace required.	None	None	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (DSP002)	Perennial Minor	9.51	4.20	8.71	Dry Open-Cut (Streambed – bedrock) [12]	Dry open-cut methods feasible/practical on small 3-5' wide headwater tributary. No additional workspace required.	None	None	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Monkey Gulch (Denied Access 05X)	Perennial Minor	10.20	9.68	10.38	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5-6' wide trapezoidal channel. Immediately adjacent to county road. High groundwater area is problematic for conventional bore crossing because of water management.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, spawning habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Stock Slough (BSP088)	Perennial Intermediate	10.32	15.67	32.50	Dry Open-Cut Level 1 [11]	Dry open-cut methods feasible/practical on channelized slough crossings. PI, residential area and topographic conditions limit workspace on north for bore. Dewatering issues likely due to high groundwater issues on south side in floodplain agricultural wetland. Multiple crossings of slough required because of residential routing constraints.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Pasture Pond (BL084)	Stock pond N/A	10.40	-	-	Adjacent to centerline within ROW	Man-made pond expected to be dry at the time of construction and will be avoided if possible. Pond will be reconstructed if disturbed.	None	None	None	Jul 1 to Sep 15	--	--	--
Catching Slough (BSP079)	Perennial Major	11.11	256.83	532.68	Conventional Bore Level 1 [11]	Dry open-cut methods not feasible based on flow, channel size (depth and width). Conventional bore feasible based on width, depth and expected groundwater dewater requirements. An HDD is probable at the approximate crossing location based on the topography, geometry and expected geotechnical conditions. Significant HDD costs, HDD time requirements were the determinants for the proposed conventional bore.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, migration, rearing habitat T, CH	Fall Chinook, Coho, Winter Steelhead	Chinook, Coho	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BDX118)	Intermittent Minor	11.29	9.24	19.16	Dry Open-Cut	Dry open-cut methods feasible/practical on small ditched tributary in pasture.	Oregon Coast ESU Coho, assumed habitat T	Coho, Winter Steelhead,	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP114)	Perennial Minor	11.47	2.02	4.19	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-3' wide headwater tributary. No additional workspace required.	None	None	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP103)	Perennial Minor	11.78	3.07	6.37	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-4' wide waterbody. ROW necked-down & no additional workspace required for crossing.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Catching Slough (BSP101)	Perennial Minor	11.84	1.22	2.53	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide waterbody. ROW necked-down & no additional workspace required for crossing.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP100)	Perennial Minor	11.87	4.76	9.87	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide waterbody ROW necked-down & no additional workspace required for crossing.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (NSI041)	Intermittent Minor	12.05	1.64	3.4	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI092)	Intermittent Minor	12.27	4.99	10.35	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI093)	Intermittent Minor	12.31	4.00	8.30	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI094)	Intermittent Minor	12.39	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small headwater waterbody expected to be dry during construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI095)	Intermittent Minor	12.39	6.76	14.02	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI096)	Intermittent Minor	12.41	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small headwater waterbody expected to be dry during construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI097)	Intermittent Minor	12.45	5.54	11.49	Dry Open-Cut	Small intermittent headwater tributary - dry open cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI098)	Intermittent Minor	12.52	6.14	12.73	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (BSP120)	Perennial Minor	12.66	-	-	Adjacent to centerline within ROW	Not crossed by centerline (likely intermittent – headwater trib.)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (BSP121)	Perennial Minor	12.68	-	-	Adjacent to centerline within ROW	Not crossed by centerline (likely intermittent headwater trib.)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (BSP122)	Perennial Minor	12.83	1.23	2.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater tributary. No additional workspace required. (likely intermittent)	None	Unknown	None	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Ross Slough (BSP125)	Perennial Minor	12.90	5.82	12.07	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater tributary. No additional workspace required. (likely intermittent)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP031)	Perennial Minor	12.97	4.21	8.73	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP030)	Perennial Minor	13.01	3.01	6.24	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP029)	Perennial Minor	13.11	4.19	8.69	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4’ wide headwater tributary. No additional workspace required.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Ross Slough (CSP028)	Perennial Minor	13.55	3.83	7.94	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP027)	Perennial Minor	13.61	2.18	4.52	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-3’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP026)	Perennial Minor	13.70	4.31	8.94	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Boone Creek (EDX078)	Perennial Minor	15.71	4.64	9.62	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on small 5’ wide waterbody. Road and topography on north side prevent conventional bore feasibility due to excessive grading/excavation requirements for bore pit on north side.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Boone Creek (CSI037)	Intermittent Minor	16.36	1.14	2.36	Dry Open-Cut	Small 1’wide intermittent tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	none	None	Jul 1 to Sep 15	--	--	--
Trib. to Boone Creek (CSP036)	Perennial Minor	16.36	4.23	8.77	Dry Open-Cut	Dry open cut methods feasible/practical on small 4’ wide headwater tributary. No additional workspace required for crossing.	None	none	None	Jul 1 to Sep 15	--	--	--
Trib. to Boone Creek (CSI035)	Intermittent Minor	16.39	1.02	2.12	Dry Open-Cut	Small 1’wide intermittent tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	none	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP024)	Perennial Minor	16.56	1.53	3.17	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1.5’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP023)	Perennial Minor	16.62	3.08	6.39	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3’ wide headwater tributary.	None	Assumed	None	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. To Catching Creek (CSP022)	Perennial Minor	16.71	2.34	4.85	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP021)	Perennial Minor	16.73	5.01	10.93	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP020)	Perennial Minor	16.78	5.81	12.05	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP019)	Perennial Minor	16.82	3.00	6.22	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP018)	Perennial Minor	16.85	8.46	17.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (BLM 17.42)	Intermittent Minor	17.42	4.05	8.40	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide headwater tributary.	None	None	None	Jul 1 to Sep 15	--	--	--
Catching Creek (CSP033)	Perennial Minor	17.47	4.25	8.81	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-4' wide headwater stream. Steep topographic constraints prevent a conventional bore crossing because of bore pit grading/excavation requirements on both sides of stream.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Coast Range Ecoregion, Coquille Sub-basin (HUC 17100305), Coquille River (HUC 1710030505) Fifth field Watershed[8], Coos County, Oregon													
Trib. To Cunningham Creek (BSP092)	Perennial Minor	18.20	2.32	4.81	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide tributary. Steep topographic constraints also prevent a conventional bore crossing because of bore pit grading/excavation requirements on north side of stream.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Cunningham Creek (BSP093)	Perennial Minor	18.28	1.34	2.78	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Cunningham Creek (BSP095)	Perennial Minor	18.33	1.38	2.86	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Cunningham Creek (BSI096)	Intermittent Minor	18.48	1.08	2.24	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide headwater tributary if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Cunningham Creek (NSP042)	Perennial Intermediate	18.93	37.68	78.15	Dry Open-Cut (Streambed-bedrock)[6] Level 1	Dry open-cut methods feasible/practical on small stream. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topographic constraints on either side of stream prevent a conventional bore crossing because of bore pit grading/excavation requirements.	Oregon Coast ESU Coho, assumed habitat T	Coho assumed, Winter Steelhead,	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To Cunningham Creek (NSP043)	Perennial Intermediate	19.06	24.58	50.98	Dry Open-Cut (Streambed-bedrock)[6]	Dry open-cut methods feasible/practical on small stream. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topographic constraints on either side of stream prevent a conventional bore crossing because of bore pit grading/excavation requirements.	Oregon Coast ESU Coho, assumed habitat T	Coho Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Coast Range Ecoregion, Coquille Sub-basin (HUC 17100305), North Fork Coquille River (HUC 1710030504) Fifth field Watershed [8] Coos County, Oregon													
Trib. to Steele Creek (ESI028)	Intermittent Minor	20.34	6.57	13.63	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 2-3’ wide intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (ESI028)	Intermittent Minor	20.59	3.14	6.51	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 2-3’ wide intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (Denied Access 06)	Intermittent Minor	20.72	3.01	6.24	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-3’ wide intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (Denied Access 07)	Intermittent Minor	20.79	1.51	3.13	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-3’ wide intermittent tributary, if flowing at time of construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (Denied Access 08)	Intermittent Minor	20.94	1.64	3.40	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-3’ wide intermittent tributary, if flowing at time of construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Steele Creek (NSP015)	Perennial Intermediate	21.10	12.10	25.1	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide tributary.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	, Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (Denied Access 09)	Intermittent Minor	21.13	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-3' wide intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (ESI029)	Intermittent Minor	21.36	-	-	Adjacent to centerline within ROW	Small 3' wide intermittent tributary adjacent to ROW not crossed.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
North Fork Coquille River (BSP207)	Perennial Intermediate	23.06	20.66	42.85	Dry Open-Cut Level 1[13]	Dry open-cut method feasible/practical on 20' wide river during low flow period within fish window. Impacts to riparian vegetation minimized by placement/setbacks of TEWAs on west side of river in field and eastside setback 100 feet from waterbody. ROW also necked down to 75 feet. Topographic conditions on east side of the crossing prevent HDD crossing methods because of elevation differences between entry/exit and necessary workspace grading requirements.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Sep 15	--	--	--
Trib. to Middle Creek (BSI137)	Intermittent Intermediate	27.01	12.70	26.34	Dry Open-Cut	Intermittent tributary to be crossed at the same time as the crossing of Middle Creek at MP 27.04 using dry open-cut. Tributary expected to be dry at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Middle Creek (BSI136)	Intermittent Minor	27.02	-	-	Adjacent to centerline within ROW	Intermittent tributary not crossed by centerline.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Middle Creek (BSI135)	Intermittent Minor	27.04	-	-	Adjacent to centerline within ROW	Intermittent tributary not crossed by centerline.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Middle Creek (BSP133)	Perennial Intermediate	27.04	64.99	134.79	Dry Open-Cut Level 2	Dry open-cut methods feasible/practical on creek during low flow period within fish window. A conventional bore crossing is not feasible because of topographic constraints on west side of creek because of grading/excavation requirements for bore pit. An HDD is not feasible because of topographic/geometry conditions.	Oregon Coast ESU Coho, rearing, migration habitat T, CH	Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Coast Range Ecoregion, Coquille Sub-basin (HUC 17100305), East Fork Coquille River (HUC 1710030503) Fifth field Watershed [8], Coos County, Oregon													
Trib. To E. Fork Coquille (BSP077)	Perennial Intermediate	28.86	12.48	25.88	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical on small incised headwater trib. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topographic conditions prevent a conventional bore because of bore pit grading/excavation requirements on both sides of the crossing.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To E. Fork Coquille (NSI099)	Intermittent Minor	29.18	6.23	12.92	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide incised trib. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topographic conditions prevent a conventional bore because of bore pit grading/excavation requirements on both sides of the crossing.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To E. Fork Coquille (BSI073)	Intermittent Intermediate	29.49	10.26	21.28	Dry Open-Cut	Dry open-cut methods feasible/practical on small tributary. Steep topographic conditions prevent a conventional bore because of bore pit grading/excavation requirements on west side of the crossing.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To E. Fork Coquille (BSI076)	Intermittent Minor	29.53	5.48	11.37	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 3-4' intermittent tributary if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
East Fork Coquille River (BSP071)	Perennial Intermediate	29.88	61.91	128.41	Dry Open-Cut Level 1[13]	Project alignment was selected based on landowner negotiations and requirement to avoid landowner's air strip. Dry open-cut methods feasible/practical during low flow crossing period during ODFW in-water work window. Conventional bore is not practical because of significant grading/excavation requirements for bore pits. The river is deeply incised below stream banks requiring extensive pits for installation below streambed. Continued bore pit dewatering would be required to keep bore pits dry. A temporary bridge is also necessary to prevent entire spread move around. A crossing bridge will require bank grading for crossing access. An HDD is probable at the approximate crossing location based on the topography, geometry and expected geotechnical conditions. Significant HDD costs, HDD time requirements and the need for a crossing bridge were the determinants for the proposed dry-open cut crossing method.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Sep 15	--	--	--
Trib. to E. Fork Coquille (Denied Access 11)	Intermittent Minor	30.21	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at the time of construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to E. Fork Coquille (Denied Access 12)	Intermittent Minor	30.27	1.51	3.13	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To E. Fork Coquille (BSI070)	Intermittent Minor	31.64	1.16	2.41	Dry Open-Cut	Small 1-wide intermittent headwater tributary, dry open-cut methods feasible/practical, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Elk Creek (BSP057)	Perennial Minor	32.40	7.67	15.91	Dry Open-Cut Level 1[13]	Dry open-cut methods feasible/practical on small 8' wide tributary. Steep topographic conditions on north side of stream prevent a conventional bore because of grading/excavation requirements for bore pit. StreamNet data indicates anadromy below crossing (~ 1 mile).	Oregon Coast ESU Coho, assumed habitat T	Coho, Winter Steelhead,	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To Elk Creek (BSP055)	Perennial Minor	32.44	3.50	7.26	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 3-4' wide tributary.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To Elk Creek (BSP049)	Perennial Minor	32.99	9.79	20.31	Dry Open-Cut	Dry open-cut methods feasible/practical on small 10' wide tributary. Topographic conditions on both sides of stream limit a conventional bore because of grading/excavation requirements for bore pits.	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Elk Creek (BSP050)	Perennial Minor	33.02	-	-	Adjacent to centerline within ROW (Streambed – bedrock)[6]	Not crossed by pipeline centerline. Small 2' wide headwater tributary expected to be dry during construction. Trib. would be crossed at the same time as BSP049 at MP 32.99.	None	Assumed	None	Jul 1 to Sep 15	--	--	--
South Fork Elk Creek (CSP005)	Perennial Intermediate	34.46	49.40	102.46	Dry Open-Cut (Streambed – bedrock)[6] Level 2	Dry open-cut methods feasible/practical on stream. Steep topographic conditions on both sides of stream prevent conventional bore crossing methods because of grading/excavation requirements for bore pits.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. To S. Fork Elk Creek (BSI251)	Intermittent Minor	35.51	4.12	8.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater tributary, if flowing at time of construction. Crossing will occur adjacent to road where existing culvert is in place.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Coast Range Ecoregion, Coquille Sub-basin (HUC 17100305), Middle Fork Coquille River (HUC 1710030501) Fifth field Watershed [8], Coos County, Oregon													
Trib. to Big Creek (BLM 35.87)	Intermittent Minor	35.87	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater tributary, if flowing at time of construction. Crossing occurs within Elk Creek Road (BLM 28-11-29-0) and flows through a 12" culvert which will be replaced.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Big Creek (BLM 36.48)	Intermittent Minor	36.48	2.26	4.69	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. To Big Creek (GSI025/BSI253)	Intermittent Minor	36.54	6.00	12.44	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater tributary, if flowing at time of construction. No additional workspace required. ODFW fish passage barrier data reports a downstream boulder canyon with a 10-foot falls at upper end (RecordID 52488). StreamNet data indicates anadromy below crossing (~ 0.5 mile) at ODFW barrier 52488.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Big Creek (BLM 36.85)	Intermittent Minor	36.85	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater tributary, if flowing at time of construction. Crossing occurs within Elk Creek Road (BLM 28-11-29-0) and flows through a 12-18" culvert which will be replaced.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Big Creek (BSI252)	Intermittent Minor	36.92	3.00	6.22	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater tributary, if flowing at time of construction. No additional workspace required. Alignment and trib. crossing along existing road. ODFW fish passage barrier data reports a downstream boulder canyon with a 10 foot falls at upper end (RecordID 52488). StreamNet data indicates anadromy below crossing (~ 1 mile) at ODFW barrier 52488.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Big Creek (ESI019)	Intermittent Minor	37.33	2.75	5.70	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater tributary, if flowing at time of construction. No additional workspace required. ODFW fish passage barrier data reports a downstream boulder canyon with a 10 foot falls at upper end (RecordID 52488). StreamNet data indicates anadromy below crossing (~ 1 mile) at ODFW barrier 52488. StreamNet data indicates anadromy below crossing (~ 1 mile) at ODFW barrier 52488.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. To Big Creek (ESP020)	Perennial Intermediate	37.35	14.93	30.97	Dry Open-Cut Level 1[13]	Dry open-cut methods feasible/practical on stream. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topography on both sides of stream prevents conventional bore crossing methods because of grading/excavation requirements for bore pits. No additional workspace proposed. ODFW fish passage barrier data reports a downstream boulder canyon with a 10 foot falls at upper end (RecordID 52488). StreamNet data indicates anadromy below crossing (~ 1 mile) at ODFW barrier 52488.	Oregon Coast ESU Coho, Spawning, rearing habitat T	Coho	Coho	Jul 1 to Sep 15	--	--	--
Upper Rock Creek (BSP041)	Perennial Intermediate	44.21	16.04	33.27	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on stream. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topography on both sides of stream prevents conventional bore crossing methods because of grading/excavation requirements for bore pits. ODFW fish passage barrier data indicated two potential downstream falls may limit passage one report as 6-8 feet (RecordID 52484). StreamNet data indicates anadromy below crossing (~ 6 miles) at ODFW barrier RecordID 52484.	None	None	None	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, Coquille Sub-basin (HUC 17100305), Middle Fork Coquille River (HUC 1710030501) Fifth field Watershed [8], Douglas County, Oregon													
Deep Creek (BSP257)	Perennial Intermediate	48.27	80.89	167.77	Dry Open-Cut	Dry open-cut methods feasible/practical on broad stream and associated wetlands. ODFW fish passage barrier data (Recordid 56033) reports downstream falls on the Middle Fork Coquille River restrict anadromy at crossing.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Middle Fork Coquille River (BSP030)	Perennial Intermediate	50.28	45.14	93.62	Dry Open-Cut (Streambed – bedrock)6 Level 1[13]	Dry open-cut methods feasible/practical on broad stream during low flows within ODFW in-water work windows. ROW has been necked down to 75 feet and TEWAs located in existing cleared areas to minimize riparian impacts. ODFW fish passage barrier data (Recordid 56033) reports downstream falls on the Middle Fork Coquille River restrict anadromy at crossing. StreamNet data also indicates duplicates this anadromy restriction at this barrier.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Middle Fork Coquille (GDX36/BSI066)	Intermittent Minor	50.45	2.63	5.45	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-4’ wide intermittent ditched tributary in ag field if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Belieu Creek (BSP061/GSI037)	Perennial Minor	50.74	5.60	11.61	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3’ wide headwater tributary. Steep topography on west side of crossing prevents conventional bore because of grading/excavation requirements for a bore pit. ODFW fish passage barrier data (RecordID 56033) reports downstream falls on the Middle Fork Coquille River restrict anadromy at the crossing.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Middle Fork Coquille (GSI038)	Intermittent Intermediate	51.02	4.39	9.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-4’ wide intermittent headwater tributary if flowing at time of construction. No additional workspace required.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Olalla Creek-Lookingglass Creek (HUC 1710030212) Fifth field Watershed [8], Douglas County, Oregon													
Trib. to Shields Creek (BSI202)	Intermittent Intermediate	55.90	55.38	114.86	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Shields Creek (BSI203)	Intermittent Minor	55.94	8.03	16.65	Dry Open-Cut	Dry open-cut methods feasible/practical on small 8’ wide intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Shields Creek (Denied Access 13)	Intermittent Minor	56.28	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3-4’ wide intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Shields Creek (Denied Access 14)	Intermittent Minor	56.34	1.55	3.21	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3-4’ wide intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Olalla Creek (BSI140)	Intermittent Minor	57.11	4.52	9.37	Dry Open-Cut (Streambed – bedrock)	Dry open-cut methods feasible/practical on small intermittent tributaries if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI140)	Intermittent Minor	57.14	2.01	4.17	Dry Open-Cut (Streambed – bedrock)	Dry open-cut methods feasible/practical on small intermittent tributaries if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI138)	Intermittent Minor	57.31	5.03	10.43	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5’ wide intermittent tributary if flowing at time of construction. ROW has been necked down to 75 feet and TEWAs located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI147/EE012)	Intermittent Minor	57.84	4.26	8.84	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4’ wide intermittent tributary if flowing at time of construction. ROW has been necked down to 75 feet and TEWAs located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI151)	Intermittent Minor	58.20	3.06	6.35	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3’ wide intermittent tributary if flowing at time of construction. ROW has been necked own to 75 feet and TEWAs located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSP159)	Perennial Intermediate	58.55	10.60	21.99	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 10’ wide tributary. ROW has been necked down to 75 feet and TEWA located in existing cleared area to minimize riparian impacts.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Olalla Creek (BSP155)	Perennial Intermediate	58.77	77.90	161.57	Dry Open-Cut Level 2	Dry open-cut methods feasible/practical on broad stream during low flows within ODFW in-water work windows. (USGS Gage station 1431120 reports Mean of monthly discharge recording period 1956 to 1973 of 2.0, 0.52 & 0.77 cfs, respectively for Jul, Aug & Sep). TEWAs have been located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI132)	Intermittent Minor	59.29	8.65	17.94	Dry Open-Cut	Dry open-cut methods feasible/practical on small 9’ wide intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Olalla Creek (BSI129)	Intermittent Intermediate	59.65	18.72	38.83	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to McNabb Creek (NSP014)	Perennial Minor	60.13	6.01	12.47	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 6' wide tributary. Extensive grading/excavation requirements limit feasibility of conventional bore methods.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
McNabb Creek (NSP013)	Perennial Intermediate	60.49	10.96	22.73	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical on tributary. TEWAs located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Clark Branch-South Umpqua River (HUC 1710030211) Fifth field Watershed [8], Douglas County, Oregon													
Kent Creek (BSP240)	Perennial Intermediate	63.95	61.66	127.89	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on broad stream during low flows within ODFW in-water work windows. Steep topographic conditions on both sides of the stream prevent conventional bore methods because of extensive grading/excavation requirements for bore pits	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Kent Creek (BSI241)	Intermittent Minor	63.95	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent tributary expected to be dry during construction and will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Rice Creek (BSP227)	Perennial Major	65.76	132.94	275.73	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical during low flows periods within ODFW in-water work windows. Alignment is defined by residential development in immediate area. ROW has been necked down to 75 feet and TEWAs located in cleared areas to minimize riparian disturbances.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Willis Creek (BSI230)	Intermittent Minor	66.87	-	-	Adjacent to centerline within ROW (Streambed – bedrock)	Not crossed by centerline, 2' wide intermittent tributary expected to be dry during summer construction period. Tributary will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
ECSI Site 583	Upland	Near MP 67.0, off Pipeline ROW Hult Chip Yard and the 2.65-acre Hult Chip Yard Parking Area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The Roseburg Forest Products site located in Douglas County is adjacent to two proposed construction yards for the PCGP Project (i.e., the 8.9-acre Hult Chip Yard and the 2.65-acre Hult Chip Yard Parking Area). According to ODEQ records, Roseburg Forest Products has been landfilling hazardous substances in its own solid waste landfill. In 1985 it was also reported that a diesel tank ruptured resulting in the release of 8,000 gallons of fuel at the site with subsequent cleanup. As of 1996, the ODEQ required no further action in the cleanup program at this facility but indicated that further work will be conducted to assess potential hazardous substance releases from the landfill of solid waste. In 2006, solvents could still be detected in the down gradient wells. Roseburg Forest Products is working with the ODEQ Solid Waste Program to create a lined ash monofill to better manage the waste they currently generate. Although this site is located within 0.07 mile of Pacific Connector's proposed 8.9-acre Hult Chip Yard, the yard would only be used as a rail port to offload pipe transported to the project area. No excavation will be required to utilize this yard; therefore contact with contaminated sediments or groundwater will not occur.		
Willis Creek (BSP168)	Perennial Intermediate	66.95	46.79	97.05	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical during low flows periods within ODFW in-water work windows. ROW has been necked down to 75 feet and TEWAs located in cleared areas to minimize riparian disturbances.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Willis Creek (BSI169)	Intermittent Intermediate	67.00	22.31	46.27	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-011)	Intermittent N/A	69.10	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent headwater tributary expected to be dry during construction and will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-012)	Perennial Intermediate	69.28	23.45	48.64	Dry Open-Cut	Dry open-cut methods feasible/practical during low flows periods within ODFW in-water work windows. No TEWAs are proposed to minimize riparian and landowner impacts.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to South Umpqua River (SS-100-013)	Perennial Intermediate	69.35	20.10	41.69	Dry Open-Cut	Dry open-cut methods feasible/practical during low flows periods within ODFW in-water work windows. No TEWAs are proposed to minimize landowner impacts.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-014)	Intermittent Minor	69.57	3.46	7.18	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-015)	Intermittent Intermediate	71.11	62.05	128.72	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary which is expected to be dry at the time of construction. Crossing would be completed during low flows periods within ODFW in-water work windows. Tributary is within required laydown area for the Direct Pipe crossing of the South Umpqua River.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
South Umpqua River (BSP026)	Perennial Major	71.30	-	-	Direct Pipe Level 2[13]	The Direct Pipe crossing method has been evaluated and determined to be feasible at the proposed crossing location. The proposed alignment has been rerouted to facilitate the crossings of I-5, South Umpqua River, Dole Road, and the railroad using a single Direct Pipe crossing. Because of subsurface geotechnical conditions the HDD crossing method has been determined to be infeasible. This crossing method/location avoids the need to use a diverted open cut to cross the South Umpqua River on the 2009 FEIS route or an open cut crossing on Reroute 67.6.	Oregon Coast ESU Coho, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Aug 31	--	--	--
Trib. to South Umpqua River (SS-100-016)	Intermittent N/A	71.37	-	-	Adjacent to centerline within ROW	Not crossed by centerline. This waterbody passes through a culvert on a road which is encompassed by TEWA 71.25 which would not affect the waterbody.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-017)	Intermittent N/A	71.69	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent headwater tributary expected to be dry during construction and will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to South Umpqua River (SS-100-018)	Intermittent Minor	72.82	3.17	6.57	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-019)	Intermittent Minor	72.96	3.55	7.36	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-021)	Intermittent Intermediate	73.21	20.99	43.53	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-020)	Intermittent Minor	73.41	3.10	6.43	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Richardson Creek (SS-100-022)	Intermittent Minor	74.03	1.58	3.28	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Myrtle Creek (HUC 1710030210) Fifth field Watershed [8], Douglas County, Oregon													
Bilger Creek (BSP001)	Perennial Minor	76.38	6.30	13.07	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide tributary. ROW necked down and TEWAs set in existing cleared areas to minimize riparian impacts. ODFW fish passage barrier data indicate two potential downstream barriers (RecordID 2571 & 2603).	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Little Lick (BSP006)	Perennial Minor	77.71	7.20	14.93	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on small 7' wide tributary. No additional workspace required. Steep topographic conditions make a conventional bore impractical because of extensive grading/excavation requirements as well as subsequent riparian disturbance.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Little Lick Creek (BSI008)	Intermittent Intermediate	77.93	12.59	26.11	Dry Open-Cut	Dry open-cut methods feasible/practical intermittent tributary if flowing at time of construction. The tributary within the TEWA would be matted and silt fenced installed as necessary to minimize disturbance and the potential for sedimentation.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Little Lick Creek (BSI010)	Intermittent Minor	78.02	2.01	4.17	Dry Open-Cut	Dry open-cut methods feasible/practical small 2' wide intermittent tributary if flowing at time of construction. The tributary within the TEWA would be matted and silt fenced installed as necessary to minimize disturbance and the potential for sedimentation.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
North Myrtle Creek (NSP037)	Perennial Intermediate	79.12	47.99	99.53	Dry Open-Cut (Streambed – bedrock)[6] Level 2[13]	Dry open-cut methods feasible/practical during low flow periods within ODFW in-water work window. (USGS Gage Station 14311000 records mean monthly flow as 5.8, 3.5 & 5.1 cfs respectively for Jul, Aug & Sep). ROW necked down to 75' to minimize riparian impacts.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to North Myrtle Creek (NSP038)	Perennial Minor	79.15	8.00	16.59	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 8.0' wide trib. if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
South Myrtle Creek (BSP172)	Perennial Intermediate	81.19	68.77	142.63	Dry Open-Cut (Streambed – bedrock)[6] Level 2[13]	Dry open-cut methods feasible/practical during low flow periods within ODFW in-water work window. (USGS Gage Station 14310700 records mean monthly flow as 5.6, 3.2 & 5.0 cfs, respectively for Jul, Aug & Sep). ROW necked down to 75' and TEWAs placed in existing cleared areas where feasible to minimize riparian impacts. Conventional bore not feasible/practical because of grading/excavation requirements on north side of stream.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to S. Myrtle Creek (BSP259)	Intermittent Minor	81.40	1.71	3.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2.0' wide trib. if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to S. Myrtle Creek (SS-100-023)	Intermittent N/A	81.45	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent tributary expected to be dry during construction and will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to S. Myrtle Creek (SS-100-024)	Intermittent N/A	81.78	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Tributary is within UCSA and will not be affected; headwater tributary expected to be dry during construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Days Creek-South Umpqua River (HUC 1710030205) Fifth field Watershed [8], Douglas County, Oregon													
Wood Creek (BSP226)	Perennial Minor	84.18	8.22	17.05	Dry Open-Cut (Streambed-bedrock) [6] Level 1 [13]	Dry open-cut methods feasible/practical on small 8' wide stream. Steep topographic conditions on either side of waterbody prevent conventional bore. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. StreamNet data indicates anadromy below crossing (~ 1 mile).	None	None	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Fate Creek (BSI236)	Intermittent Minor	88.20	6.07	12.59	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small intermittent ditched trib. if flowing at time of construction. Appropriate BMPs would be installed to minimize disturbance/sedimentation if flowing at the time of construction.	None	Unknown	Chinook, Coho	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Fate Creek (BSP232)	Perennial Intermediate	88.48	12.11	25.12	Dry Open-Cut (Streambed-bedrock) [6] Level 1 [13]	Dry open-cut methods feasible/practical on 12' wide stream. Stream flow expected to be insignificant during low flow periods within ODFW in-water work period. TEWAs placed in existing cleared areas and alignment selected to minimize riparian impacts. ODFW fish passage barrier data indicates that immediately downstream of crossing (RecordID 2602): "Gabion below forms pool and creates a probable impassable juvenile barrier. Adults may pass at higher flows. Additional STEP work above culvert" A conventional bore is probable based on topography and geometry but geotechnical investigations have not been completed to confirm. A bridge is required at the crossing which would require bank grading for access. Significant costs, time requirements and the need for a bridge were the determinants for the proposed dry open-cut crossing method. Significant cultural resource sites occur in the area and a dry open-cut crossing will minimize excavation/grading disturbance compared to conventional bore.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead	Coho Assumed	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Days Creek (BSP233)	Perennial Intermediate	88.60	58.99	122.35	Dry Open-Cut (Streambed-bedrock) [6] Level 1 [13]	Dry open-cut methods feasible/practical on stream during low flow periods within ODFW in-water work window. (USGS Gage Station 14308700 records mean monthly flow as 2.2, 1.0 & 1.5 cfs, respectively for Jul, Aug & Sep). The ROW has been necked down to 75' and TEWAs located in previously disturbed areas to minimize riparian impacts. A conventional bore is probable based on topography and geometry but geotechnical investigations have not been completed to confirm. A bridge is required at the crossing which would require bank grading for access. Significant costs, time requirements and the need for a bridge were the determinants for the proposed dry open-cut crossing method. Significant cultural resource sites occur in the area and a dry open-cut crossing will minimize excavation/grading disturbance compared to conventional bore.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	None	Jul 1 to Sep 15	--	--	--
Cascades Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Days Creek-South Umpqua River (HUC 1710030205) Fifth field Watershed [8, 9], Douglas County, Oregon													
Saint John Creek (ASP303)	Perennial Intermediate	92.62	39.98	82.92	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical during low flow periods within ODFW in-water work window. Steep topographic conditions on either side of creek prevent conventional bore. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate issues/risk of threading pipe string under flume within the incised valley.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
South Umpqua River (ASP196)	Perennial Major	94.73	204.92	425.02	Diverted Open-Cut Level 2[13]	Diverted open-cut methods feasible/practical during low flow periods within ODFW in-water work window. (USGS Gage Station 143308600 records mean monthly flow as 168, 91 & 110 cfs, respectively for Jul, Aug & Sep). ROW and TEWAs locations primarily affect shrub vegetation. Temporary bridge required at crossing because the existing bridge at Milo is not expected to handle project weight limits. Heavy equipment access from the south is restricted by topographic constraints therefore temporary bridge at crossing is critical to facilitate construction (i.e., movement of materials and equipment along ROW). Because of geometry and topographic conditions, the only feasible HDD alignment required the alignment to pass immediately adjacent to the north side of the Milo Academy. From the exit point on the east side of the academy the route then needed to circle back to the west passing immediately adjacent to the south side of the academy. The HDD alignment ultimately required the academy to be encircled by the pipeline on three sides. This alignment would extensively encumber the academy and was determined to be impractical. A conventional bore is feasible based on topography and geometry but geotechnical investigations have not been completed to confirm. If subsoils are similar as surface conditions (cobbles), a bore would be infeasible. Because a bridge is required at the crossing which would require bank grading for access the diverted open-cut crossing method was selected as most appropriate crossing method based on feasibility/practicality and the method with the least risk.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Aug 31	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to South Umpqua River (ASI193)	Intermittent Intermediate	94.85	15.28	31.69	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at the time of construction.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (ASI193)	Intermittent Intermediate	95.03	10.34	21.45	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua (ASI190)	Intermittent Minor	98.46	8.65	17.95	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 2-4' wide intermittent tributary (ditch) if flowing at the time of construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Cascades Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Upper Cow Creek (HUC 1710030206) Fifth field Watershed [8], Douglas County, Oregon													
Naturally Occurring Mineralized Mercury	Near Perennial and Intermittent Waters	Potential Throughout Upper Cow Creek Watershed (MP 109.0 to 110.0)	Variable	Variable	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater wetland/tributary-if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	No tailings have been identified within the planned construction right-of-way. The erosion and sediment control BMPs described in the footnotes below are expected to address the management of materials containing naturally occurring metals, such as mercury.		
Trib. to East Fork Cow Creek (GW014/FS-HF-C)	Perennial (FS – Interpretation) Intermediate	109.17	12.02	24.91	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater wetland/tributary-if flowing at the time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
Trib. to East Fork Cow Creek (GSI016/FS-HF-F)	Intermittent Minor	109.33	7.54	15.64	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide headwater intermittent tributary if flowing at the time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
East Fork Cow Creek (GSP019/FS-HF-G/ASP297)	Perennial Intermediate	109.47	26.31	54.57	Dry Open-Cut (Streambed-bedrock) [6]	Dry open-cut methods feasible/practical on small headwater stream during low flow periods within ODFW in-water work period. No additional work areas proposed.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
East Fork Cow Creek (GSP022/FS-HF-M ASP297)	Perennial Intermediate	109.69	-	-	Adjacent to centerline within TEWA	Not crossed by centerline. Waterbody flows through culvert on road which is encompassed by TEWA 109.68-N. This TEWA was selected for parking/staging as well as for potential mitigation to remove the culvert if the road is not required.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to East Fork Cow Creek (FS-HF-J)	Perennial Minor	109.69	10.27	21.30	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' headwater tributary. ROW necked down to 75' and TEWAs only utilized on north side of creek to minimize riparian impacts. Steep topographic conditions prevent a conventional bore because of extensive grading/excavation requirements.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to East Fork Cow Creek (FS-HF-K)	Perennial Minor	109.78	5.16	10.70	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-4' headwater tributary. ROW necked down to 75' and no TEWAs utilized to minimize riparian impacts.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Cascades Ecoregion, South Umpqua Sub-basin (HUC 17100302), Upper Cow Creek (HUC 1710030206) Fifth field Watershed [8], Jackson County, Oregon													
Trib. to East Fork Cow Creek (ESI068/FS-HF-N)	Intermittent Intermediate	110.98	16.41	34.04	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-4' headwater tributary which is expected to be dry at the time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
Cascades Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Trail Creek (HUC 1710030706) Fifth field Watershed [8], Jackson County, Oregon													
Trib. to W. Fork Trail Creek (ESI068)	Intermittent Minor	110.76	-	-	Adjacent to centerline within TEWA 110.73	Small 1-2' wide ephemeral drainage located Peavine Quarry within TEWA; drainage to be avoided by construction; drainage expected to be dry during construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
West Fork Trail Creek (ASP202)	Perennial Intermediate	118.89	24.77	50.38	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods practical/feasible during low flow periods during ODFW in-water work window. ROW necked down to 75' and TEWAs located in previously disturbed areas to minimize riparian impacts.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead, Winter Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Trib. to Trail Creek (RS019)	Intermittent Intermediate	119.83	25.48	52.85	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Trail Creek (Denied Access16)	Intermittent Minor	119.90	1.84	3.82	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater tributary if flowing at the time of construction (Denied Access).	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Canyon Creek (NSP011)	Perennial Minor	120.45	6.61	13.71	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical on small 7' wide tributary during low flow periods within ODFW in-water work window. Only UCSAs utilized at crossing to minimize impacts to riparian areas.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Trib. to Trail Creek (ASI205)	Intermittent Minor	120.92	6.39	13.25	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide intermittent headwater tributary if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Trail Creek (ASI206)	Intermittent Intermediate	121.58	13.81	28.64	Dry Open-Cut	Dry open-cut methods feasible/practical on 12' wide intermittent tributary if flowing at the time of construction. No additional workspace required.	SONCC Coho, spawning, rearomg habitat T, CH	Coho	Coho	Jun 15 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Cascades Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Shady Cove-Rogue River (HUC 1710030707) Fifth field Watershed [8], Jackson County, Oregon													
Trib. to Cricket Creek (ESI071)	Intermittent Minor	121.87	-	-	Adjacent to centerline within ROW	Small 1' wide ephemeral stream expected to be dry during construction when the Rogue River HDD pullback would cross this tributary. Rollers would be used to span tributary with HDD pullback string.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Cricket Creek (ESI070)	Intermittent Minor	121.89	-	-	Adjacent to centerline within ROW	Small 7' wide intermittent stream expected to be dry during construction when the Rogue River HDD pullback would cross this tributary. Rollers would be used to span tributary with HDD pullback string.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Cricket Creek (ESI072)	Intermittent Minor	121.93	-	-	Adjacent to centerline within ROW	Small 2' wide ephemeral stream expected to be dry during construction when the Rogue River HDD pullback would occur, however this drainage would be avoided by construction activities.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Cricket Creek (ESI073)	Intermittent Minor	121.94	-	-	Adjacent to centerline within ROW	Small 2' wide ephemeral stream expected to be dry during construction when the Rogue River HDD pullback would occur, however this drainage would be avoided by construction activities.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Cricket Creek (ESI074)	Intermittent Minor	122.09	-	-	Adjacent to centerline within ROW	Small 2' wide ephemeral stream expected to be dry during construction when the Rogue River HDD pullback would occur.	None	Unknown		Jun 15 to Sep 15	--	--	--
Rogue River (ASP235)	Perennial Major	122.65	244.59	611.48	HDD	HDD feasible based on geometry, topography and geotechnical conditions along proposed alignment. Primary HDD activities are significantly set back from crossing and would not be visible from the highway or the river Conventional bore not feasible/practical because highway and topographic constraints on the west side of the crossing Dry open-cut or diverted open-cut methods not practical/feasible based on flow and channel characteristics (USGS Gage Station 14339000 records mean monthly flow as 2,170, 2,160 and 1,710 respectively for Jul, Aug & Sep).	SONCC Coho, rearing, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Summer Steelhead, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jun 15 to Aug 31	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Indian Creek (ASI223)	Intermittent Major	125.91	4.87	10.10	Dry Open-Cut	Dry open-cut methods feasible/practical on small <5' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI222)	Intermittent Major	125.98	5.43	11.26	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (RS004)	Intermittent Minor	126.50	1.18	2.45	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI220)	Intermittent Minor	126.52	4.08	8.46	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI221)	Intermittent Minor	126.59	5.65	11.72	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (RS003)	Intermittent Minor	126.59	-	-	Adjacent to centerline within ROW	Not crossed by the centerline. Small headwater tributary expected to be dry at the time of construction and would be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI311)	Intermittent Minor	126.65	3.29	6.82	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Deer Creek (ASP307)	Perennial Intermediate	128.49	28.52	59.15	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical during low flow periods within ODFW in-water work window. No additional workspace required. StreamNet data reports anadromy below crossing (~ 2 miles).	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Indian Creek (AW278)	Perennial Minor	128.63	<10	614.92	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical small < 10' wide stream low flow periods within ODFW in-water work window. Stream located in heavily grazed irrigated pasture and riparian vegetation consists of emergent pasture species. StreamNet data reports anadromy below crossing (~ 2 miles).	SONCC Coho assumed habitat T, CH	Assumed	Coho Assumed	Jun 15 to Sep 15	--	--	--
Trib. To Indian Creek (ASP310)	Perennial Minor	128.70	5.22	10.83	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical small 5' wide ditch tributary located in heavily grazed irrigated pasture. StreamNet data reports anadromy below crossing (~ 2 miles).	None	Unknown	None	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. To Indian Creek (AW309)	Intermittent Intermediate	128.89	30.00	62.22	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 10 wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. To Indian Creek (ASI400)	Intermittent Minor	129.13	1.42	2.95	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3-4' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. To Indian Creek (ASI306)	Intermittent Minor	129.21	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small headwater tributary expected to be dry at the time of construction and would be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI277)	Intermittent Minor	129.48	4.04	8.38	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3-4' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Cascades Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Big Butte Creek (HUC 1710030704) Fifth field Watershed [8], Jackson County, Oregon													
Trib. to Neil Creek (AW245)	Intermittent Minor	130.84	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small tributary expected to be dry at the time of construction and would be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Neil Creek (AW244)	Intermittent Major	130.85	131.84	273.45	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small < 10' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Neil Creek (ASI246)	Intermittent Minor	130.89	2.02	4.19	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent headwater trib. if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Neil Creek (ASI250)	Intermittent Minor	131.55	4.79	9.93	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5' wide intermittent headwater trib. if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Neil Creek (ASI251)	Intermittent Minor	131.72	3.95	8.19	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent headwater tributary.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Neil Creek (ASP252)	Perennial Intermediate	132.00	39.41	81.74	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical during low flow within ODFW in-water work window. ROW narrowed to 75 feet and TEWAs placed in pasture to minimize riparian impacts.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Quartz Creek (ASI265)	Intermittent Minor	132.75	2.36	4.89	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 2' wide intermittent stream if flowing at the time of construction.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead	Coho	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Quartz Creek (AW264)	Intermittent Intermediate	132.77	40.44	83.88	Dry Open-Cut (streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small intermittent stream/wetland, if flowing at the time of construction. ROW necked down to 75' and TEWAs set back to minimize riparian impacts.	SONCC Coho possible habitat T, CH	Coho possible	Coho possible	Jun 15 to Sep 15	--	--	--
Trib. to Quartz Creek (ASP241)	Perennial Intermediate	133.35	44.80	92.92	Dry Open-Cut	Tributary will likely be crossed with the bore of the Medford Aqueduct.	SONCC Coho assumed habitat T	Unknown	Coho Assumed	Jun 15 to Sep 15	--	--	--
Medford Aqueduct Ditch 3 (ASP240)	Perennial Intermediate	133.38	29.36	60.89	Conventional Bore	Proposed conventional bore feasible/practical based on flow volume, channel geometry and potential risk in disturbing man-made aqueduct. Dry open cut feasible	SONCC Coho assumed habitat T	Unknown	Coho Assumed	Jun 15 to Sep 15	--	--	--
Cascades Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Little Butte Creek (HUC 1710030708) Fifth field Watershed[8], Jackson County, Oregon													
Whiskey Creek (ASI207)	Intermittent Intermediate	137.48	10.37	21.51	Dry Open-Cut	Dry open-cut methods feasible/practical on small 10' wide intermittent headwater stream if flowing at the time of construction. ROW necked down to 75' and TEWAs set back to minimize riparian impacts.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI208)	Intermittent Intermediate	138.26	10.37	21.51	Dry Open-Cut	Dry open-cut methods feasible/practical on small 10' wide intermittent headwater stream if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI210)	Intermittent Minor	138.45	1.72	3.57	Dry Open-Cut	Dry open-cut methods feasible/practical on small <10' wide intermittent headwater stream if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI211)	Intermittent Minor	138.71	7.22	14.98	Dry Open-Cut	Dry open-cut methods feasible/practical on small 7' wide intermittent headwater stream if flowing at the time of construction. No additional workspace required.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI214)	Intermittent Minor	139.15	6.99	14.50	Dry Open-Cut	Dry open-cut methods feasible/practical on small 7' wide intermittent headwater stream if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Stock Pond (AL215)	Stock pond N/A	139.17	54.30	112.62	Dry Open-Cut	Man-made stock pond to be reconstructed after construction	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI216)	Intermittent Intermediate	139.19	10.31	21.38	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater stream if flowing at the time of construction. No additional workspace required.	None	None	None	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Lick Creek (ASI216)	Intermittent Intermediate	139.21	13.05	27.07	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater stream if flowing at the time of construction. No additional workspace required.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI217)	Intermittent Intermediate	139.39	15.84	32.85	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater stream if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI226)	Intermittent Minor	139.59	6.59	13.67	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 7' wide intermittent headwater stream if flowing at the time of construction. ROW necked down to 75 feet and TEWAs located in existing disturbed pasture to minimize riparian impacts.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI227)	Intermittent Intermediate	139.63	10.91	22.63	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 1-2' wide intermittent headwater stream if flowing at the time of construction. ROW necked down to 75 feet and no TEWAs utilized to minimize riparian impacts.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI228)	Intermittent Intermediate	139.68	31.75	65.85	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-2' wide intermittent headwater drainage if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI229)	Intermittent Minor	139.72	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent headwater drainage not expected to be flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI232)	Intermittent Minor	139.83	1.20	2.49	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide intermittent headwater drainage if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Lick Creek (ASI233)	Intermittent Intermediate	140.26	12.33	25.57	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on intermittent drainage if flowing at the time of construction. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. ROW necked down to 75' and TEWAs set back to minimize riparian impacts. StreamNet data indicates anadromy below crossing (~ 2 miles)	SONCC Coho assumed habitat T	Assumed	Coho Assumed	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Lick Creek (ASI189)	Intermittent Minor	140.58	2.62	5.43	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ASI187)	Intermittent Minor	141.17	2.51	5.21	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ASI188)	Intermittent Intermediate	141.44	43.20	89.60	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (RS017)	Intermittent Minor	141.49	4.45	9.23	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater trib., if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ESI030)	Intermittent Minor	141.95	6.25	12.96	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide intermittent headwater trib. if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ESI031)	Intermittent Intermediate	142.36	13.44	27.88	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater trib. if flowing at the time of construction. Altered trib. part of pasture irrigation system.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Salt Creek (ESP034)	Perennial Intermediate	142.57	41.32	85.70	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on creek during low flow period within ODFW in-water work window. ROW necked down to 75' and TEWAs located in existing disturbed pasture to minimize riparian impacts. Bore not practical because both bore pits would be located in wetland likely requiring significant dewatering efforts to access bore pits.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ESI037)	Intermittent Minor	143.10	4.84	10.04	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater trib. if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Long Branch Creek (ESI038)	Intermittent Minor	143.47	2.21	4.58	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Long Branch Creek (ESI039)	Intermittent Minor	143.71	3.26	6.76	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Stock Pond (EL041)	Stock Pond N/A	143.73	-	-	Adjacent to centerline within ROW	Man-made pond expected to be dry at the time of construction and the pond will be reestablished after construction	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Long Branch Creek (ESI038)	Intermittent Minor	143.73	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Intermittent drainage on very edge of TEWA; likely can be avoided during construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Long Branch Creek (ESI040)	Intermittent Minor	143.74	5.05	10.47	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Long Branch Creek (ESI038)	Intermittent Minor	144.11	2.04	4.23	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent headwater trib. if flowing at the time of construction.	SONCC Coho, assumed habitat T	Coho Assumed Summer Steelhead	Coho Assumed	Jun 15 to Sep 15	--	--	--
Trib. to S. Fork Long Branch (GSP005/ESP048)	Perennial Minor	144.70	7.09	14.71	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction.	SONCC Coho assumed habitat T	Assumed	Coho Assumed	Jun 15 to Sep 15	--	--	--
South Fork Long Branch Cr (GPS006/ESP059)	Intermittent Minor	145.27	7.12	14.77	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to S. Fork Long Branch (ESI061)	Intermittent Intermediate	145.54	13.66	28.33	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
North Fork Little Butte Creek (ESP066)	Perennial Intermediate	145.69	48.77	101.15	Dry Open-Cut Level 2	Dry open-cut methods feasible/practical on stream during ODFW in-water work window. USGS Gage Station 1434300 reports that mean monthly flow are 89, 111, 105 and 67 for Jun, Jul, Aug and Sep, respectively. Flows in Jul and Aug are highest yearly flow periods for creek. TEWA set back and located primarily in previously disturbed (pastures) areas to minimize riparian impacts.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead, Winter Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Trib. to N. Fork Little Butte Creek (ESI056)	Intermittent Intermediate	146.05	17.49	36.28	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent trib, if flowing at the time of construction. No additional workspace required.	SONCC Coho possible habitat T	Coho possible	Coho possible	Jun 15 to Sep 15	--	--	--
Trib. to N. Fork Little Butte Creek (ESI055)	Intermittent Minor	146.38	3.36	6.97	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent trib. if flowing at the time of construction.	SONCC Coho possible habitat T	Coho possible	Coho possible	Jun 15 to Sep 15	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to N. Fork Little Butte Creek (ESI052)	Intermittent Intermediate	146.75	-	-	Adjacent to ROW	Not crossed by centerline or ROW.	None	None	None	Jun 15 to Sep 15	--	--	--
Stock Pond (AL169)	Stock Pond N/A	152.33	-	-	Adjacent to TEWA 152.29-N	Stock pond not to be disturbed by construction activities.	None	None	None	Jun 15 to Sep 15	--	--	--
Eastern Slopes Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Little Butte Creek (HUC 1710030708) Fifth field Watershed [8, 9], Jackson County, Oregon													
South Fork Little Butte Creek (ASP165)	Perennial Intermediate	162.45	19.62	40.69	Dry Open-Cut Level 1	Dry-open cut feasible and practical on creek. ODFW fish passage barrier data (RecordID 51163) indicates that downstream irrigation diversion dam/barrier (~ 0.5 miles): is unladdered and impassible. USGS Gage Station 14339500 – located below diversion reports monthly mean flow of 14, 12 and 11 cfs, respectively for Jul, Aug & Sep. ROW necked down to 75 feet and TEWAs set back to minimize riparian impacts.	None	None	None	Jun 15 to Sep 15	--	--	--
Daley Creek (ESI076)	Intermittent Intermediate	166.21	25.51	52.961	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater intermittent trib. if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Eastern Slopes Ecoregion, Upper Klamath River (HUC 18010206) Sub-basin, Spencer Creek (HUC 1801020601) Fifth field Watershed [8, 9], Klamath County, Oregon													
Spencer Creek (EW085)	Intermittent Minor	171.07	3.81	7.90	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 10' wide stream with associated wetland. ROW necked down 75 feet and TEWAs set back or located to the edge of existing road disturbance to minimize riparian and wetland impacts. Conventional bore not practical because of topographic conditions and grading/excavation requirements on the south side of creek.	None	None	None	Aug 1 to Sep 30	--	--	--
Trib. to Spencer Creek (GSP007)	Perennial Minor	171.57	4.05	8.40	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 2' wide intermittent trib/wetland. if flowing at the time of construction.	None	None	None	Aug 1 to Sep 30	--	--	--
Trib. to Spencer Creek (EW107)	Intermittent Minor	172.48	4.34	9.00	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 10' wide intermittent trib. if flowing at the time of construction. ROW necked down 75 feet and TEWAs set back to minimize riparian and wetland impacts.	None	None	None	Aug 1 to Sep 30	--	--	--
Trib. to Spencer Creek (ESI106)	Intermittent Minor	173.74	8.17	16.95	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 5' wide ephemeral trib. if flowing at the time of construction.	None	None	None	Aug 1 to Sep 30	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Spencer Creek (ESI069/GSI010)	Intermittent Minor	176.55	2.02	4.19	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 4' wide intermittent trib. if flowing at the time of construction.	None	None	None	Aug 1 to Sep 30	--	--	--
Clover Creek (EW103/GSI011)	Intermittent Minor	177.76	5.14	10.66	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on small < 10' wide intermittent trib. if flowing at the time of construction. No additional workspace required.	None	None	None	Aug 1 to Sep 30	--	--	--
Eastern Slopes Ecoregion, Upper Klamath River (HUC 18010206) Sub-basin, John C Boyle Reservoir-Klamath River (HUC 1801020602) Fifth field Watershed [8], Klamath County, Oregon													
Trib. to Klamath River (ESI097)	Intermittent Minor	186.61	7.17	14.87	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent trib. if flowing at the time of construction. Intermittent stream feeds stock pond.	None	None	None	Jul 1 to Jan 31	--	--	--
Trib. to Klamath River (ESI099)	Intermittent Minor	186.65	2.64	5.48	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Jan 31	--	--	--
Trib. to Klamath River (ESI100)	Intermittent Intermediate	186.74	10.66	22.11	Dry Open-Cut	Small 2' wide intermittent tributary that runs adjacent to centerline within ROW. Tributary expected to be dry during construction and would be restored to approximate original contour and grade during restoration.	None	None	None	Jul 1 to Jan 31	--	--	--
Eastern Slopes Ecoregion, Lost (HUC 18010204) Sub-basin, Lake Ewauna-Upper Klamath River (HUC 1801020412) Fifth field Watershed [8], Klamath County, Oregon													
Trib. To Klamath River (ASI013/SS-100-025)	Intermittent Minor	188.90	3.16	6.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Jan 31	--	--	--
Weyerhaeuser Pond (AL034)	Industrial Pond N/A	196.77	-	-	Adjacent to centerline within ROW	Pond will not be disturbed by construction activities. The pond may be used for discharge.	None	None	None	Jul 1 to Jan 31	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information											
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**
ECSI Site 655	Upland	South of ROW near MP 198.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	This 660-acre Weyerhaeuser facility is located south of the ROW in Klamath County. The site was originally a sawmill constructed in 1929. Operation of the mill was discontinued in 1992, and several buildings at the site have been demolished. An old landfill was present where wood waste and painted hardboard was burned; at least one paint drum was identified. High concentrations of Total Petroleum Hydrocarbons were observed at the sawmill and powerhouse facilities, and a stormwater outfall to the Klamath River was observed to have an oily sheen. In addition, sediment contamination was confirmed by high levels of arsenic, chromium, copper, mercury, polycyclic aromatic hydrocarbons and droplets of petroleum in most sediment samples. The ODEQ is concerned with groundwater contamination at the site and has scored the facility as a high priority for further action. Weyerhaeuser agreed to conduct additional sediment sampling for sediment bioassays and chemical analysis. ODEQ recommended that a risk assessment be conducted to determine the potential for residual contamination in sediment to affect human health (for example, recreational users) and the environment (for example, aquatic wildlife). This work has not been completed. The PCGP Project has been routed to the north and around this former mill location, which is currently occupied by Collins Forest Products; therefore disturbance to contaminated materials is unlikely. Trenching activities will occur up-gradient of the site; therefore any groundwater that may be encountered in the trench in this area should not be contaminated by the past activities at the mill. If trench dewatering is required in this area, Pacific Connector will coordinate with ODEQ to ensure compliance.
ECSI Site 2878	Upland	Near MP 199.0 off Pipeline ROW Klamath Falls Memorial Drive Contractor Yard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The DG Shelter Products site is located in Klamath County and is also the same location as the PCGP Project's proposed Klamath Falls Memorial Drive Contractor Yard. This site, located near a portion of the Klamath River, was added to ODEQ's hazardous site database for tracking purposes because it is on ODEQ's 303d-list for toxics and an ODH health advisory is in effect. Site screening was recommended and completed in 2001. Currently, there are no additional actions listed for the site. The PCGP Project's proposed Klamath Falls Memorial Drive Contractor Yard is located at the DG Shelter Products site. The use of this potential yard will not require any excavation activities or ground disturbance; therefore contact with any potential site contamination is unlikely. Prior to utilizing this site as a project yard, Pacific Connector will further investigate the status of this site with the ODEQ.

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Klamath River (ASP151)	Perennial Major	199.38	-	-	HDD Level 1	HDD feasible/practical based on river crossing width (~ 1000') flow volumes, topography, geotechnical and geometry conditions. Dry open-cut infeasible because of width and flow volume. USGS Gage Station 11507501 records mean monthly discharge of 1,190, 1,060, 1,120 cfs respectively for Jul, Aug, Sep.	Lost River Sucker E, CH Shortnose Sucker E, CH	Pacific Lamprey	None	Jul 1 to Jan 31	--	--	--
ECSI Site 2785	Upland	0.38 mile E of ROW near MP 206.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Mac's Store is located in Klamath County east of MP 206.0. The site is listed in the ODEQ hazardous waste site database due to a suspected underground fuel spill. It was recommended for site screening in 2001. Concentrations of petroleum hydrocarbons and volatile organic compounds (VOCs) were not detected in water samples collected from nearby wells in 2006 and 2007. No impacts to drinking water wells have historically been observed. In 2008, two soil borings were installed by ODEQ. Groundwater monitoring of wells MW-1, MW-4, MW-5, and the Store/residential well was performed on 2009. ODEQ has determined that no further action is required to address contamination at the site. This site is located approximately 0.38 mile east of the project alignment near MP 206.0; therefore it is unlikely that trenching activities will encounter any contaminated sediments or groundwater potentially associated with this site. Pacific Connector's proposed Klamath Falls North Cross Roads East Construction Yard is located immediately adjacent to the PCGP alignment at MP 206.0 and will be within 0.25 mile of this site. However, since no trenching or other excavation activities will occur at this proposed yard, potential contact with contaminated groundwater will not occur.		
Eastern Slopes Ecoregion, Lost (HUC 18010204) Sub-basin, Mills Creek-Lost River (HUC 1801020409) Fifth field Watershed [8], Klamath County, Oregon													
Lost River (NSP001)	Perennial Major	212.05	118.38	245.53	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical during low flow periods during ODFW in-water work window. An HDD and conventional bore are likely probable at the approximate crossing location based on the topography, geometry and expected geotechnical conditions. Landowner restricted access for geotechnical investigations. Significant costs, time requirements were the determinants for the proposed dry open-cut method.	Lost River Sucker E Shortnose Sucker E	None	None	Jul 1 to Mar 31	--	--	--

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Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Unnamed Creek (ASI051)	Intermittent Intermediate	216.10	12.80	26.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6-12’ wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Mar 31	--	--	--
Unnamed Creek (ASI052)	Intermittent Minor	216.11	3.01	6.24	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3’ wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Mar 31	--	--	--
Unnamed Creek (ASI050)	Intermittent Intermediate	216.30	25.23	52.33	Dry Open-Cut	Dry open-cut methods feasible/practical on intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Mar 31	--	--	--
Unnamed Creek (ASI049)	Intermittent Minor	216.43	6.95	14.41	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6’ wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Mar 31	--	--	--
Trib. to D Canal (ASI136)	Intermittent Intermediate	218.09	23.48	48.70	Dry Open-Cut	Dry open-cut methods feasible/practical on intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Trib. to D Canal (ASI37)	Intermittent Minor	218.46	3.06	6.35	Dry Open-Cut (Streambed-bedrock)[6]	Dry open-cut methods feasible/practical on small 3’ wide intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Trib. to D Canal (ASI291)	Intermittent Minor	219.69	1.28	2.65	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on small 1’ wide intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Excavated Pond (NL116)	Excavated Pond N/A	219.70	-	-	Off ROW – Temp Extra Workspace	Pond will not be disturbed by construction activities. The pond may be used for a water source for dust control.	None	None	None	Jul 1 to Mar 31	--	--	--
Unnamed Creek (ASI138)	Intermittent Minor	221.77	5.02	10.41	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5’ wide intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Pond (EL077)	Pond N/A	222.84	-	-	Adjacent to centerline within ROW	Pond will not be disturbed by construction activities. The pond may be used for a water source for dust control.	None	None	None	Jul 1 to Mar 31	--	--	--
Trib. to V Canal (ESI050)	Intermittent Minor	224.95	-	-	Adjacent to centerline within ROW	Intermittent trib. will not be disturbed by project disposal activities within county landfill/quarry.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Trib. to V Canal (ESI051)	Intermittent Minor	224.95	-	-	Adjacent to centerline within ROW	Intermittent trib. will not be disturbed by project disposal activities within county landfill/quarry.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Trib. to V Canal (ASI140)	Intermittent Intermediate	225.07	28.33	58.76	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info

1. Pacific Northwest Hydrography Framework, National Hydrography Dataset, Jones and Stokes Field Surveys from 2006, 2007, and 2009, StreamNet, photo interpretation, and consultation with BLM and Forest Service
2. USGS Hydrologic Unit Codes, from the WBD
3. Key Watershed
4. Jones and Stokes Wetland Survey Waterbody Identification Number
5. Pacific Northwest Hydrography Framework Clearinghouse Waterbody longitude/latitude unique identifier number.
6. Streambed bedrock based on Pacific Connector's Wetland and Waterbody delineation surveys (see Table C-3 in the Wetland Delineation Report, submitted as a stand alone report). Streambed bedrock may require special construction techniques to ensure pipeline design depth. Special construction techniques may include rock hammering, drilling and hammering, or blasting. The need for blasting would be determined by the contractor and would only be initiated after ODFW blasting permits are obtained.
7. Minor waterbody includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of construction; intermediate waterbody includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of construction; and major waterbody includes all waterbodies greater than 100 feet wide at the water's edge at the time of construction.
8. Oregon Department of Forestry Classifications: F – Fish, D- Domestic, N- none, * Domestic use yet to be determined.
9. Northwest Forest Plan Classifications: fish bearing streams (F), permanently flowing non-fish bearing streams (N), seasonally flowing or Intermittent streams (I), lakes and natural ponds (P)
10. Source: Oregon Department of Environmental Quality, 2010 Integrated Report GIS coverage. Cat: 4A – water quality Limited, TMDL approved, Cat: 4B – water quality limited, other control measures, Cat: 4C – water quality limited, not a pollutant, Cat: 5 – water quality limited, 303(d) list, TMDL needed.
11. Water quality limited within one mile of crossing, not at point of crossing.
12. FERC waterbody definitions:
    i. Minor = less than or equal to 10 feet wide
    ii. Intermediate = greater than 10 feet wide but less than or equal to 100 feet wide
    iii. Major = greater than 100 feet wide
13. Level 1 and 2 waterbodies have been identified; all others are Level 0. According to GeoEngineers 2013 Channel Migration and Scour Analysis for the PCGP Project, channel migration is defined as the lateral movement, over time, of an entire channel segment perpendicular to the direction of stream flow; channel avulsion is the sudden abandonment of an active channel for a newly created or previously abandoned channel located on the floodplain; channel widening is defined as erosion and subsequent recession of one or both stream banks that widens the channel without changing the channel location; streambed scour is erosion of the streambed resulting in the development of deep pools and/or the systematic lowering of the channel floor elevation.
    i. Level 0 = streams not likely subject to migration, avulsion and/or scour
    ii. Level 1 = streams with a moderate potential for migration, avulsion and/or scour
    iii. Level 2 = streams with a high potential for migration, avulsion and/or scour
14. Dry open-cut crossing methods include Flume or Dam and Pump procedures. Dam and Pump methods would be utilized where streambed blasting is anticipated to eliminate blasting around the flume. The Dam and Pump crossing method is the preferred crossing procedure in steep incised drainage valleys where worker safety may be compromised when placing ("threading") the pipe string under the flume pipe and where there is a risk of upsetting the flume during this operation. The Dam and Pump crossing method is also the preferred crossing method on small streams under low flow conditions during the recommended ODFW-recommended in-water work period. Pacific Connector requests permission for temporary/short-term fish passage restriction when completing Dam and Pump crossings within the ODFW-recommended in-water work period.
15. FWS, NMFS, and StreamNet. T = Threatened, E = Endangered, CH = Critical Habitat

Sediment Evaluation Framework (SEF)
Level 1 Site History Information

Applicant Provided Preliminary Information:

1. A map showing the project site location (include river mile if applicable), layout, existing storm drainages and outfalls, and special aquatic sites (e.g., wetlands, eelgrass beds, ponds, lakes).
2. Current project area land uses and history of site ownership and prior land uses.
3. Current and prior adjacent property land uses, especially those properties up gradient or upstream/current from the project site.
4. Site characteristics that could affect movement of CoCs (i.e. prop wash, barge/ferry traffic, port traffic, dredged navigational channels, bar scalping, instream dredging sites).
5. Outfalls information, such as construction year, type, flow volume (capacity), and non-point discharge elimination system (NPDES) data. Industrial processes at or near the site and hazardous substances used/generated at these sites
6. Specific information on Environmental Cleanup, brownfields, leaking storage tanks, etc., for the State of Oregon can be found at: http://www.oregon.gov/DEQ/. Specific site information on Oregon Cleanup Sites can be found at: http://www.deq.state.or.us/lq/ECSI/ecsi.htm.
7. In the State of Washington, this information can be found at http://www.ecy.wa.gov/cleanup.html or http://www.ecy.wa.gov/programs/tcp/mtca_gen/hazsites.html.
8. CERCLA-listed site information. See http://www.epa.gov/superfund/sites/npl/index.htm and information listed in no. 3, above.
9. Spill events. These sites may provide information:
   http://www.ecy.wa.gov/programs/spills/incidents/main.html
   http://www.deq.state.or.us/lq/ECSI/ecsi.htm
   http://www.fws.gov/oregonfwo/Contaminants/.
10. Results of any previous sampling and/or testing.
11. Any dredging activity and data/information from that activity.
12. Fill out Conceptual Site Model table, below. Guidance on completing the conceptual site model can be found in the "Supplemental Guidance for the Portland District: Sampling and Analysis Plan Preparation under the 2009 *Sediment Evaluation Framework for the Pacific Northwest.*," located on the District's Dredged Material Evaluation webpage: http://www.nwp.usace.army.mil/Missions/Environment/DMM.aspx

Table X. Conceptual Site Model (CSM) for Dredging and Disposal Activities.

SEDIMENT RELEASE FROM DREDGING AND UNCONFINED, AQUATIC PLACEMENT/DISPOSAL (if applicable)

Media of Concern (where chemicals of concern may be present)	**Release[1] Mechanism** (process that liberates or reveals chemicals of concern from media)	**Secondary Media** (other media impacted)	**Primary Pathway** (route from media to receptor)		**Potential Receptors**					
					Benthic Inverts.	Fish	ESA Species	Critical Habitat	Birds/Mammals	Humans
SEDIMENT →	**Resuspension**[2] (during dredging or aquatic disposal) →	Water column →	Direct Contact →							
	Generated Residuals[3] (redeposited from sloughing, dislodging, slope failure, or resettling during dredging or disposal) →	Settled sediment →	Direct Contact →							
			Dietary →	Tertiary Media, Tissue →						
	Undisturbed Residuals[4] (as uncovered during dredging- measured as the new surface material) →	Newly exposed sediment surface →	Direct Contact →							
			Dietary →	Tertiary Media, Tissue →						

Receptor Pathway Abbreviations: **C** = Pathway complete; **P** = Potentially complete pathway; **I** = Incomplete/insignificant pathway; NA = not applicable (e.g., NSM is bedrock or concrete)

[1] Release: the process by which the dredging operation results in the transfer of contaminants from sediment pore water and sediment particles into the water column or air (i.e., repartitioning). Contaminants in near-surface sediments (e.g., transport from redeposited sediment or residuals) may be released into the water column by densification, diffusion, and bioturbation (Bridges et. al., 2008).

[2] Resuspension: The process by which dredging and attended operations dislodge bedded sediment particles and disperse them into the water column. Resuspension rates range from <0.1% to over 5% (Bridges et. al., 2008).

[3] Redeposition: The process by which suspended particles resettle on the surface of the sediment after disturbance. Redeposition can occur in the near field (the plume area dominated by rapid settling velocities, changes in sediment total suspended concentration, and load with distance from the dredging operation) or the far field (the area where the total load in the plume is slowly varying and where advection, diffusion and settling are of the same order of magnitude).

[4] Residuals: Contaminated sediment found at the post-dredging surface of sediment profile, either within or adjacent to the dredging footprint (Bridges et. al., 2008). Examples include contaminated surface sediments uncovered by dredging, but not fully removed (e.g., newly exposed surface) or contaminated sediment dislodged from nearby slopes during dredging or slope failures. Although in-water disposal does not create undisturbed residuals, resuspended sediment particles settling at a site become part of the generated dredging residuals.

SEDIMENT RELEASE FROM OTHER TYPES OF DISPOSAL (not considered in the SEF)

	Disposal Method	**Disposal Location**	**Transport Processes** (Examples)
SEDIMENT →	Upland Disposal →	Upland Confined Aquatic Disposal (CDF)	The following upland processes are outside of the purview of SEF review: 1. Leaching 2. Surface runoff 3. Volatilization 4. Bioaccumulation Additional information on the evaluation of these disposal options can be found the following manuals: 1. Corps. 2003. Upland Testing Manual, ERD/EL TR-03-1. 2. EPA. 1998. Guidance for In Situ Subaqueous Capping of Contaminated Sediment, EPA 905-B96-004.
	Nearshore Disposal →	Nearshore CDF	
	Subaqueous Capping →	Engineered Cap	

QUICK REFERENCE CHART for RGL 16-01

APPROVED JDs	PRELIMINARY JDs
• An AJD is defined in Corps regulations at 33 CFR 331.2. A definitive, official determination that there are, or that there are not, jurisdictional aquatic resources on a parcel and the identification of the geographic limits of jurisdictional aquatic resources on a parcel, can only be made by means of an AJD.	• A JD requestor may elect to use a PJD to move ahead expeditiously to obtain a Corps permit authorization, where the requestor determines that it is in his or her best interest to do so. • May include the delineation limits of all aquatic resources on a parcel so long as the PJD does not determine the jurisdictional status of such aquatic resources.
• Will specify what aquatic resources are or are not jurisdictional on a parcel for purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures.	• A requestor may elect to use a PJD even where initial indications are that the aquatic resources on a site may not be jurisdictional, if the requestor makes an informed, voluntary decision that it is in his or her best interest not to request and obtain an AJD. • For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a PJD will treat all aquatic resources that would be affected in any way by the permitted activity on the site as jurisdictional aquatic resources. • When the Corps provides a PJD, or authorizes an activity based on a PJD, the Corps is making no legally binding determination of any type regarding whether jurisdiction exists over the particular aquatic resource in question.
• Remains valid for period of five years (subject to certain limited exceptions explained in RGL 05-02).	• Do not have expiration dates (see RGL 05-02).
• Can be administratively appealed through the Corps administrative appeal process set out at 33 CFR Part 331.	• A PJD is not an appealable action. A PJD is "preliminary" in the sense that a recipient of a PJD can later request and obtain an AJD if that becomes necessary or appropriate during the permit process or during the administrative appeal process.
• May be requested through the use of the "Request for Corps JD" included with RGL 16-01 as Appendix 1. Even if the JD requestor or Corps district does not use the "Request for Corps JD", the same information and signature provided in the "Request for Corps JD" should be submitted to the Corps district with each JD request.	• May be requested through the use of the "Request for Corps JD" included with RGL 16-01 as Appendix 1. Even if the JD requestor or Corps district does not use the "Request for Corps JD", the same information and signature provided in the "Request for Corps JD" should be submitted to the Corps district with each JD request.

OTHER OPTIONS TO BE CONSIDERED

NO PERMIT REQUIRED	OTHER CIRCUMSTANCES
• For situations where the proposed activity is not a regulated activity or an activity is exempt under Section 404(f) of the CWA and is not recaptured, preparation of a "no permit required" letter may be appropriate, and no JD is required, so long as that letter makes clear that it is not addressing geographic jurisdiction.	• The Corps generally does not issue a JD of any type where no JD has been requested and there are certain circumstances where a JD would not be necessary (such as authorizations by non-reporting nationwide general permits). In some circumstances, including where the Corps verifies general permits or issues letters of permission and/or standard permits, jurisdictional questions may not arise.

Appendix 1 - REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: District Name Here

- I am requesting a JD on property located at: _____
  (Street Address)
  City/Township/Parish: _____ County: _____ State: _____
  Acreage of Parcel/Review Area for JD: _____
  Section: _____ Township: _____ Range: _____
  Latitude (decimal degrees):_____ Longitude (decimal degrees): _____
  (For linear projects, please include the center point of the proposed alignment.)
- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.
- ___ I currently own this property. ___ I plan to purchase this property.
  ___ I am an agent/consultant acting on behalf of the requestor.
  ___ Other (please explain): _____.
- Reason for request: (check as many as applicable)
  ___ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
  ___ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
  ___ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
  ___ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
  ___ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
  ___ A Corps JD is required in order to obtain my local/state authorization.
  ___ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
  ___ I believe that the site may be comprised entirely of dry land.
  ___ Other: _____
- Type of determination being requested:
  ___ I am requesting an approved JD.
  ___ I am requesting a preliminary JD.
  ___ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
  ___ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

*Signature: _____ Date: _____

- Typed or printed name: _____
  Company name: _____
  Address: _____
  _____
  Daytime phone no.: _____
  Email address: _____

***Authorities:** Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.
Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.
Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.
Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

Pacific Connector GAS PIPELINE / Jordan Cove LNG	Response to USACE Environmental Data Request Dated November 3, 2017	DAVID EVANS AND ASSOCIATES INC.
	Document Number: J1-000-RGL-PMT-DEA-00005-00	
	Rev.: A — **Rev. Date:** December 1, 2017	

Jordan Cove Energy Project / Pacific Connector Gas Pipeline

Response to USACE Environmental Data Request Dated November 3, 2017

Corps No: NWP-2017-41

Document Number:

J1-000-RGL-PMT-DEA-00005-00

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Attachment C: Bulk Upload Templates

Attachment D: Roseburg Site Dredge Disposal Plan View and Cross Sections

Attachment E: APCO Dredge Disposal Site Cross Plan View and Cross Sections

Pacific Connector GAS PIPELINE Jordan Cove LNG™	**Corps No: NWP-2017-41**	DAVID EVANS AND ASSOCIATES INC.
	Document Number: J1-000-RGL-PMT-DEA-00005-00	
	Rev.: A	**Rev. Date: December 1, 2017**

Response to USACE Environment Data Request Dated November 3, 2017

Jordan Cove Energy Project
Pacific Connector Gas Pipeline
Section 404/10 Permit Application
Response to USACE Environmental Data Request Dated November 3, 2017

FILED December 1, 2017

Jordan Cove Energy Project
Pacific Connector Gas Pipeline
Section 404/10 Permit Application
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List of Attachments

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Jordan Cove Energy Project and Pacific Connector Gas Pipeline
Corps No. NWP-2017-41
Response to Environmental Information Request

Filed: December 1, 2017

On October 23, 2017, Jordan Cove LNG, LLC (JCLNG), also referred to as the Applicant, submitted the above referenced Section 404/10 permit application for the proposed Jordan Cove Energy Project (JCEP) and Pacific Connector Gas Pipeline (PCGP) projects for USACE review. In a data request letter dated November 3, 2017 (see Attachment A), USACE indicated that the 404/10 permit application is incomplete, and that before the public notice can be issued, several pieces of additional information are required.

In addition to the above referenced information request, JCLNG noted in its cover letter for the October 23, 2017 Section 404/10 permit application submittal that a number of items would be submitted under separate cover. These items include the Compensatory Wetland Mitigation Plan (CWMP) and the Bulk Upload Templates for the JCEP and Pacific Connector Gas Pipeline (PCGP) project. The CWMP and the Bulk Upload Templates are provided as attachments B and C, respectively, and are referenced within this response letter as applicable.

Responses to November 3, 2017 USACE Data Request

Items a through c below are identified in the November 3, 2017 data request as information that must be submitted to USACE before public notice can be issued. It is understood that the remaining items must be submitted before work can be authorized under USACE statutory authorities.

a. *[Provide] "A dredged material disposal and management plan for all proposed dredged material disposal sites (33 CFR 325.1(d)(3)). The proposed action includes relocation of dredged material to several offsite locations. Disposal plans in general, and for each site, need to include both plan and elevation view drawings and a description of all work or activities necessary to prepare the disposal site to receive dredged material. For example, would existing ground surfaces be excavated or berms created to contain dredged material? To assist you we are providing a list of the information necessary by disposal site:"*

1) LNG Terminal site:
a. A dredged material disposal and management plan;

2) South Dunes site:
a. A dredged material disposal and management plan;

3) The proposed Kentuck Slough compensatory mitigation site:
a. Plan and elevation view drawings of ground disturbing activities (33 CFR 325.d(2);

Jordan Cove Energy Project and Pacific Connector Gas Pipeline
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Response to Environmental Information Request

Filed: December 1, 2017

b. A dredged material disposal and management plan;

JCEP Response:

Section 4.4 of the Dredged Material Management Plan (DMMP), provided as Attachment E of the Section 404/10 Application, contains a general description of the dredge material disposal plans for all of the proposed dredge material disposal sites, as well as the activities necessary to prepare each site to receive dredged material. Note that the USACE data request letter does not inquire specifically about material placement at the Roseburg site adjacent to the LNG Terminal and South Dunes sites. The applicant would like to highlight that the 404/10 permit application correctly indicate that dredge material will also be placed at the Roseburg site which is included in the JCEP project area.

Generally, containment berms will be created around the perimeter of the LNG Terminal Site, South Dunes site and Roseburg sites. Berms will be constructed via excavation of existing onsite material using earthmoving equipment to contain dredged material. Material placed at the Roseburg site will consist exclusively of hydraulically dredged material, and will be contained using constructed berms in a manner similar to the LNG Terminal and South Dunes sites. Mechanically excavated material will be placed at the LNG Terminal site, and the balance of excavated material along with some hydraulically dredged material will be placed at the South Dunes site in a typical fashion as detailed in Attachment D for the Roseburg site. The plan and elevation view drawings for the Roseburg site (Attachment D) are also representative of the methods that will be used to manage dredge material at the LNG Terminal and South Dunes sites.

Containment berm construction at the APCO sites will involve excavation of onsite material, and, where practical, use of incoming dredge material. See Attachment E for a plan view and elevations of the APCO dredge disposal sites.

At the Kentuck site, dredge material will be hydraulically offloaded from a barge or scow to the site and graded to raise the subgrade to an elevation conducive to established desired plant communities. A variety of temporary structures and detour facilities will be used to isolate work areas from aquatic resources. In addition, all work at the Kentuck site within Coos Bay and Kentuck Slough will be conducted within the approved in-water work window. The CWMP (Attachment B) contains plan and cross sections drawings, details on construction specifications and schedule for the proposed work at the Kentuck site.

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Response to Environmental Information Request

Filed: December 1, 2017

Response provided by:

Name: Derik Vowels
Affiliation: David Evans and Associates, Inc.
Phone: (503) 499-0264

b. *[Provide] "An elevation view drawing of ground disturbing activities at the proposed eelgrass mitigation site (33 CFR 325.1(d)(2));"*

JCEP Response:

Please see Figure 2 of the CWMP (Attachment B) for the eelgrass mitigation site grading plan and cross section views showing the limits of ground disturbing activity at the eelgrass mitigation site.

Response provided by:

Name: Derik Vowels
Affiliation: David Evans and Associates, Inc.
Phone: (503) 499-0264

c. *[Provide] "A plan and elevation view drawing depicting how and where dredged material return water would discharge to Coos Bay from the APCO east (Mainland) confined disposal area (33 CFR 325.1(d)(3));"*

JCEP Response:

Decant water from the APCO Site 2 dredged material disposal site will discharge to Pony Slough through the return water pipeline located above HMT on the south end of APCO Site 2. At APCO Site 1, decant water will discharge to Coos Bay through the return water pipeline located above HMT on the north side of the site. See Attachment E for plan and elevation view drawings showing the dredge material decant water return pipelines at the APCO sites.

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Response to Environmental Information Request

Filed: December 1, 2017

Response provided by:

Name: Derik Vowels
Affiliation: David Evans and Associates, Inc.
Phone: (503) 499-0264

As noted above, it is understood that the following items are not required to be submitted to USACE before public notice can be issued, but must be addressed before work can be authorized under USACE statutory authorities.

Compliance with the Endangered Species Act and Cultural Resources Laws

Before authorizing work under our statutory authorities, the Corps must ensure a project complies with other applicable Federal laws and regulations such as the Endangered Species Act (ESA) and Cultural Resources laws. All actions will be coordinated with the appropriate Native American Indian Tribes. The Corps anticipates Federal Energy Regulatory Commission (FERC) in their role as the lead agency, will fulfill these procedural and legal requirements with the assistance of the Corps.

The project may affect several species and their habitats as protected under the ESA and the Magnuson-Stevens Fishery Conservation and Management Act. As such, the Corps, in coordination with the FERC, will need to consult with both the U.S. Fish & Wildlife Service and the National Marine Fisheries Service. The Corps cannot complete our evaluation and JCLNG may not begin work until this requirement has been fulfilled.

JCEP Response:

In its capacity as the lead federal agency on the JCLNG and PGCP Project, FERC will undertake all necessary Section 106 consultation with the appropriate Tribes. In addition, FERC will provide an Applicant-prepared Biological Assessment (BA) to initiate consultation with USFWS and NMFS.

Response provided by:

Name: Derik Vowels
Affiliation: David Evans and Associates, Inc.
Phone: (503) 499-0264

Jordan Cove Energy Project and Pacific Connector Gas Pipeline
Corps No. NWP-2017-41
Response to Environmental Information Request

Filed: December 1, 2017

Individual 401 Water Quality Certification (WQC)

The Standard Individual Permit under which we are evaluating your project requires an individual 401 WQC from the Oregon Department of Environmental Quality (DEQ). To expedite the process, JCLNG should provide a copy of the permit application package to the DEQ. The permit application package can be sent to Mr. Chris Stine at DEQ at 1102 Lincoln Street, Suite 210, Eugene, Oregon 97401. Mr. Stine may be reached by telephone at (541) 686-7810 or by email at stine.chris@deq.state.or.us.

JCEP Response:

The Applicant is currently in the process of preparing an individual 401 WQC package for submittal to DEQ. A copy will be provided to USACE upon submittal. The Applicant provided DEQ with a copy of the 404/10 permit application when it was issued to USACE on October 23, 2017.

Response provided by:

Name:	Derik Vowels
Affiliation:	David Evans and Associates, Inc.
Phone:	(503) 499-0264

Coastal Zone Management Act (CZMA) Concurrence

The Standard Individual Permit under which we are evaluating your project requires an individual CZMA concurrence from the Oregon Department of Land Conservation and Development (DLCD). To expedite the process, JCLNG should provide a copy of the permit application package to the DLCD. The permit application package can be sent to Ms. Elizabeth Ruther of the DLCD at 635 Capitol St. NE, Suite 150, Salem, Oregon 97301-2540. Ms. Ruther may be reached by telephone at (503) 934-0029, or by email at elizabeth.j.ruther@state.or.us.

JCEP Response:

The Applicant has initiated coordination with DLCD regarding an individual CZMA concurrence. To expedite the process, the Applicant will provide a copy of the 404/10 permit application package to DLCD.

Jordan Cove Energy Project and Pacific Connector Gas Pipeline
Corps No. NWP-2017-41
Response to Environmental Information Request

Filed: December 1, 2017

Response provided by:

Name: Derik Vowels
Affiliation: David Evans and Associates, Inc.
Phone: (503) 499-0264

Impacts to Waterbodies from Upgrading or Rehabilitation of Road Crossings

You indicate JCLNG may need to upgrade or rehabilitate a number of road crossings particularly those along the route of the proposed pipeline. Please be advised the need to replace or improve waterbody crossings required for pipeline access, construction, staging, or maintenance activities may require a DA permit. The Section 404 CWA maintenance exemption applies to currently serviceable structures where no change in character, scope, or size of the original fill prism would occur (33 CFR 323.4(a)(2)).

JCEP Response:

Currently, during detailed engineering design work, PCGP is assessing the roads that may require improvement and will complete wetland delineations of all road improvement areas in the winter of 2017/2018 or spring of 2018. PCGP will provide supplemental reporting/impact analysis of the road improvements to the COE and FERC once complete.

Response provided by:

Name: Derik Vowels
Affiliation: David Evans and Associates, Inc.
Phone: (503) 499-0264

Portland Sediment Evaluation Team (PSET) Review

The Portland Sediment Evaluation Team (PSET) has reviewed the data from the previous iteration of the project pursuant to the Sediment Evaluation Framework (SEF) for the Pacific Northwest. Enclosed is a copy of the Suitability Determination Memorandum (SDM) for the Project (Enclosure 1). Due to project changes and the span of time from the initial SDM, the PSET's previous evaluation may need to be updated. The PSET recommends reviewing the January 2016 SDM and TABLE A to highlight, delete, or add project changes that correlate to PSET review. Examples include, but are not limited to, dredging, re-use of dredged materials in waters/wetlands, stream crossings, in-water and wetland mitigation areas, and any new contaminant information available.

Jordan Cove Energy Project and Pacific Connector Gas Pipeline
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Response to Environmental Information Request

Filed: December 1, 2017

To facilitate PSET review, please prepare a 2016 SEF Level 1 analysis for areas where all project changes have occurred. Data to support the analysis should be provided in a tabular format consistent with the format utilized for the PSET's previous project review. You may either create a new spreadsheet or utilize the previous January 2016 SDM and TABLE A as a starting point to provide additional project information. Providing the data in this format will ensure the PSET can receive information in a manner that assists them in evaluating the proposal effectively under the 2016 SEF. Further, the PSET recommends reviewing sections 3.1 and 3.2 of the 2016 SEF regarding the level of detail and type of Level 1 information required for PSET review and requests JCLNG utilize the 2016 SEF and the updated marine analytes list (SEF Table 5-1) with the respective marine screening levels (SEF Table 6-2).

Information regarding the 2016 SEF can be found at the following website: http://www.nwp.usace.army.mil/Portals/24/docs/environment/sediment/2016_SEF_Pacific_NW.pdf. The PSET lead for Corps Portland District is Mr. James Holm. Mr. Holm may be reached at (503) 808-4963 or James.A.Holm@usace.army.mil. A Level 1 SEF site history information guidance document is enclosed for your reference (Enclosure 2).).

JCEP Response:

The Applicant is reviewing whether and where Project changes have occurred within previous PSET information for the Project, including the Suitability Determination Memorandum provided as Enclosure 1 of USACE's November 3, 2017 letter. A response will be provided subsequent to that review.

Response provided by:

Name: Derik Vowels
Affiliation: David Evans and Associates, Inc.
Phone: (503) 499-0264

Preliminary Jurisdictional Determination

Please clarify if the Project is seeking a Preliminary Jurisdictional Determination (JD) or Approved JD for the proposed action. A JD is a written indication that wetlands and waterways within your project area may be waters of the United States. Such waters will be treated as jurisdictional waters of the United States for purposes of computation of impacts and compensatory mitigation requirements. As referenced in Attachment C of JCLNG's application, the Corps has previously provide Preliminary JD's for multiple

aquatic resources found within the project area. The enclosed forms can assist you in rendering a decision regarding which type of JD the project is seeking (Enclosure 3 and 4).

JCEP Response:

Attachment C.9 in the 404/10 permit application package provides a summary of current JDs and requests to renew existing JDs, as well as requests for JDs in new areas not currently covered.

Response provided by:

Name: Derik Vowels
Affiliation: David Evans and Associates, Inc.
Phone: (503) 499-0264

Section 408 Permit

Under Section 14 of the RHA codified in 33 USC 408 (Section 408) authorizes the Secretary of the Army (Secretary), on the recommendation of the Chief of Engineers of the Corps, to grant permission for the alteration, occupation or use of a Corps Civil Works Project if the Secretary determines the activity will not be injurious to the public interest and will not impair the usefulness of the project. A DA permit cannot be issued prior to a District decision regarding the need for, or resolution of, Section 408 permission.

JCEP Response:

The Applicant acknowledges that a DA permit cannot be issued prior to a District decision regarding the need for, or resolution of, Section 408 permission.

Response provided by:

Name: Derik Vowels
Affiliation: David Evans and Associates, Inc.
Phone: (503) 499-0264

Attachment A: USACE Data Request Letter, November 3, 2017

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, PORTLAND DISTRICT
NORTH BEND FIELD OFFICE
2201 N. BROADWAY, SUITE C
NORTH BEND, OREGON 97459-2372

November 3, 2017

Operations Division

SUBJECT: Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline Project
Corps No. NWP-2017-41

Ms. Caroline Burda
Jordan Cove LNG, LLC.
5615 Kirby Drive, Suite 500
Houston, Texas 77005
caroline.burda@jordancovelng.com

Dear Ms. Burda:

The U.S. Army Corps of Engineers (Corps) received the Jordan Cove LNG Terminal and Pacific Connector Gas Pipeline Project's (JCLNG) request for Department of Army (DA) authorization to construct a liquefied natural gas export terminal and appurtenant features. The application identified the following additional project components: a pipeline, slip and access channel, marine offloading facility, dredging near the Coos Bay Federal Navigation Channel, dredged material disposal locations, improvements to TransPacific Parkway, a utility/access road, two mitigation sites, a worker's camp, and a resource center. JCLNG's project has been assigned Corps No. NWP-2017-41. Please refer to this number in all future correspondence.

The Corps' regulatory authority is found primarily in the Rivers and Harbors Act of 1899 (RHA) and the Clean Water Act (CWA). Under Section 10 of the RHA, the Corps possesses the authority to issue permits for structures or work (including excavation) in or affecting navigable waters of the United States. The limits of our jurisdiction extend landward up to the mean high water mark in tidally influenced areas and to the ordinary high water mark in non-tidal, navigable waters.

Under Section 404 of the CWA, the Corps authority to issue permits for the placement of dredged or fill material into waters of the United States. The term "waters of the United States" includes the territorial seas and tidally influenced waters. Limits of jurisdiction under Section 404 extend landward to the high tide line. "Waters" also include all other waters that are part of a surface tributary system to and including navigable (non-tidal) waters of the United States. Limits of jurisdiction extend landward up to the ordinary high water mark. Wetlands adjacent to these waters are also "waters of the United States."

The proposed work exceeds the screening thresholds of our Nationwide and General Permits and will be evaluated as a Standard Individual Permit. This process affords the public to provide comment regarding the proposed project.

Corps regulations found at 33 CFR 325.1(d)(2) require that all activities which an applicant plans to undertake that are reasonably related to the same project, and for which a DA permit would be required, be included in the same permit application. Further, District Engineers should reject, as incomplete, any permit application which fails to comply with this requirement. The contents of a complete application are defined in 33 CFR 325.1(d).

The Corps has determined your application is incomplete. Before the public notice can be issued, we will need the following information *(please note all drawings must be in 8.5 by 11-inch format, legible and reproducible in black and white)*:

a. A dredged material disposal and management plan for all proposed dredged material disposal sites (33 CFR 325.1(d)(3)). The proposed action includes relocation of dredged material to several offsite locations. Disposal plans in general, and for each site, need to include both plan and elevation view drawings and a description of all work or activities necessary to prepare the disposal site to receive dredged material. For example, would existing ground surfaces be excavated or berms created to contain dredged material? To assist you we are providing a list of the information necessary by disposal site:

1) LNG Terminal site:

    a. A dredged material disposal and management plan;

2) South Dunes site:

    a. A dredged material disposal and management plan;

3) The proposed Kentuck Slough compensatory mitigation site:

    a. Plan and elevation view drawings of ground disturbing activities (33 CFR 325.d(2);

    b. A dredged material disposal and management plan;

b. An elevation view drawing of ground disturbing activities at the proposed eelgrass mitigation site (33 CFR 325.1(d)(2));

c. A plan and elevation view drawing depicting how and where dredged material return water would discharge to Coos Bay from the APCO east (Mainland) confined disposal area (33 CFR 325.1(d)(3));

Before authorizing work under our statutory authorities, the Corps must ensure a project complies with other applicable Federal laws and regulations such as the Endangered Species Act (ESA) and Cultural Resources laws. All actions will be coordinated with the appropriate Native American Indian Tribes. The Corps anticipates Federal Energy Regulatory Commission (FERC) in their role as the lead agency, will fulfill these procedural and legal requirements with the assistance of the Corps.

The project may affect several species and their habitats as protected under the ESA and the Magnuson-Stevens Fishery Conservation and Management Act. As such, the Corps, in coordination with the FERC, will need to consult with both the U.S. Fish & Wildlife Service and the National Marine Fisheries Service. The Corps cannot complete our evaluation and JCLNG may not begin work until this requirement has been fulfilled.

The Standard Individual Permit under which we are evaluating your project requires an individual 401 WQC from the Oregon Department of Environmental Quality (DEQ). To expedite the process, JCLNG should provide a copy of the permit application package to the DEQ. The permit application package can be sent to Mr. Chris Stine at DEQ at 1102 Lincoln Street, Suite 210, Eugene, Oregon 97401. Mr. Stine may be reached by telephone at (541) 686-7810 or by email at stine.chris@deq.state.or.us.

The Standard Individual Permit under which we are evaluating your project requires an individual CZMA concurrence from the Oregon Department of Land Conservation and Development (DLCD). To expedite the process, JCLNG should provide a copy of the permit application package to the DLCD. The permit application package can be sent to Ms. Elizabeth Ruther of the DLCD at 635 Capitol St. NE, Suite 150, Salem, Oregon 97301-2540. Ms. Ruther may be reached by telephone at (503) 934-0029, or by email at elizabeth.j.ruther@state.or.us.

You indicate JCLNG may need to upgrade or rehabilitate a number of road crossings particularly those along the route of the proposed pipeline. Please be advised the need to replace or improve waterbody crossings required for pipeline access, construction, staging, or maintenance activities may require a DA permit. The Section 404 CWA maintenance exemption applies to currently serviceable structures where no change in character, scope, or size of the original fill prism would occur (33 CFR 323.4(a)(2)).

The Portland Sediment Evaluation Team (PSET) has reviewed the data from the previous iteration of the project pursuant to the Sediment Evaluation Framework (SEF) for the Pacific Northwest. Enclosed is a copy of the Suitability Determination Memorandum (SDM) for the Project (Enclosure 1). Due to project changes and the span of time from the initial SDM, the PSET's previous evaluation may need to be updated. The PSET recommends reviewing the January 2016 SDM and TABLE A to highlight, delete, or add project changes that correlate to PSET review. Examples include, but are not limited to, dredging, re-use of dredged materials in waters/wetlands, stream crossings, in-water and wetland mitigation areas, and any new contaminant information available.

To facilitate PSET review, please prepare a 2016 SEF Level 1 analysis for areas where all project changes have occurred. Data to support the analysis should be provided in a tabular format consistent with the format utilized for the PSET's previous project review. You may either create a new spreadsheet or utilize the previous January 2016 SDM and TABLE A as a starting point to provide additional project information. Providing the data in this format will ensure the PSET can receive information in a manner that assists them in evaluating the proposal effectively under the 2016 SEF. Further, the PSET recommends reviewing sections 3.1 and 3.2 of the 2016 SEF regarding the level of detail and type of Level 1 information required for PSET review and requests JCLNG utilize the 2016 SEF and the updated marine analytes list (SEF Table 5-1) with the respective marine screening levels (SEF Table 6-2).

Information regarding the 2016 SEF can be found at the following website: http://www.nwp.usace.army.mil/Portals/24/docs/environment/sediment/2016_SEF_Pacific_NW.pdf. The PSET lead for Corps Portland District is Mr. James Holm. Mr. Holm may be reached at (503) 808-4963 or James.A.Holm@usace.army.mil. A Level 1 SEF site history information guidance document is enclosed for your reference (Enclosure 2).

Please clarify if the Project is seeking a Preliminary Jurisdictional Determination (JD) or Approved JD for the proposed action. A JD is a written indication that wetlands and waterways within your project area may be waters of the United States. Such waters will be treated as jurisdictional waters of the United States for purposes of computation of impacts and compensatory mitigation requirements. As referenced in Attachment C of JCLNG's application, the Corps has previously provide Preliminary JD's for multiple aquatic resources found within the project area. The enclosed forms can assist you in rendering a decision regarding which type of JD the project is seeking (Enclosure 3 and 4).

Under Section 14 of the RHA codified in 33 USC 408 (Section 408) authorizes the Secretary of the Army (Secretary), on the recommendation of the Chief of Engineers of the Corps, to grant permission for the alteration, occupation or use of a Corps Civil Works Project if the Secretary determines the activity will not be injurious to the public interest and will not impair the usefulness of the project. A DA permit cannot be issued prior to a District decision regarding the need for, or resolution of, Section 408 permission.

The Corps' decision to issue a permit, issue a permit with conditions, or deny the permit request will be based upon an evaluation of the probable impacts including cumulative impacts of the proposal and its intended use on the public interest. During this review the benefits, which may reasonably be expected to accrue from the proposal, are balanced against its reasonably foreseeable detriments.

We remain committed to working with the FERC to ensure the information contained in the forthcoming National Environmental Policy Act evaluation and consultation/coordination processes is sufficient for the Corps to render a permit decision. Working before obtaining a DA permit is a violation of Federal laws. Receipt of a permit from the Oregon Department of State Lands (DSL) does not obviate the requirement for obtaining a DA permit prior to commencing the proposed work.

Please provide the information requested within 30 days of the date of this letter. Once the requested information is provided, we will continue to process and evaluate your application. If we do not receive the requested information within 30 days we will withdraw your application.

Please direct any questions regarding the Corps' Regulatory Program or process to Mr. Tyler J. Krug, by telephone at (541) 756-2097, or by email at Tyler.J.Krug@usace.army.mil. Questions regarding the 408 process should be directed to Ms. Marci E. Johnson at (503) 808-4765, (503) 915-3551, or via email at Marci.E.Johnson@usace.army.mil.

Sincerely,

Tyler Krug

Tyler J. Krug
Project Manager
Eugene Permit Section
Regulatory Branch

Enclosures

cc:

Federal Energy Regulatory Commission (Peconom)
U.S. Army Corps of Engineers (Johnson/McMillan/Holm)
Oregon Department of State Lands (Lobdell)
Oregon Department of Environmental Quality (Camarata/Stine)
Oregon Department of Land Conservation and Development (Snow/Ruther)
Agent (Vowels)

CENWP-EC-HR (Sediment Quality) 19 January 2016

MEMORANDUM FOR FILE, Portland District, Regulatory Branch, (CENWP-OD-G, Krug)

RE: Portland Sediment Evaluation Team (PSET) Level 2A dredged material suitability determination memorandum (SDM) for construction of the Pacific Connector Gas Pipeline (PCGP), in Klamath, Jackson, Douglas and Coos Counties; and the Jordan Cove LNG (liquid natural gas) Project (JCLNG)[1] near North Bend, Coos County, Oregon (Regulatory File No. NWP-2012-441).

1.0 Introduction. The JCLNG and PCGP have applied to the Federal Energy Regulatory Commission (FERC) for approval to construct and operate a LNG terminal and natural gas pipeline. Due to their interconnectedness, these two projects are being jointly evaluated by the resource agencies as the Jordan Cove LNG and Pacific Connector Gas Pipeline Project (JCLNG-PCGP Project). The project would affect various wetlands and waterways located in Coos, Douglas, Jackson and Klamath counties.

1.1 The PSET's Role. The interagency PSET's primary mission is to evaluate the suitability of project sediments for unconfined, aquatic disposal; the PSET also evaluates the suitability of the post-dredge surface for unconfined, aquatic exposure. The PSET Agencies include the US Army Corps of Engineers – Portland District (Corps, lead), US Environmental Protection Agency – Region 10 (EPA, co-lead), National Marine Fisheries Service (NMFS), US Fish and Wildlife Service (USFWS), ODEQ, and Washington Department of Ecology (Ecology). Each of these agencies has regulatory authority over work proposed in waters of the United States.

1.2 State and Regional Sediment Evaluation Guidance. The PSET uses the following guidance documents to evaluate the suitability of project sediments:

- May 2009 *Sediment Evaluation Framework for the Pacific Northwest*, prepared by the Northwestern Regional Sediment Evaluation Team (RSET)
- 9 August 2009 "Supplemental Guidance for the Portland District: Sampling and Analysis Plan Preparation under the 2009 *Sediment Evaluation Framework for the Pacific Northwest*," prepared by the PSET
- April 2007 "Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment [Report No. 07-LQ-023A]" prepared by ODEQ

The PSET uses these guidance documents to ensure that projects permitted by the Portland District Regulatory Branch comply with the sediment evaluation regulations associated with the federal CWA[2] and MPRSA[3]. The PSET's interagency review is also used in the section 7 Endangered Species Act consultation.

1.3 Scope of PSET Evaluation. Federal regulatory authorities governing this project include:

☑ Section 10, Rivers and Harbors Act
☑ Section 404, Clean Water Act (CWA)
☑ Section 401, CWA
☑ Section 7, Endangered Species Act
☑ Section 305 of the Magnuson-Stevens Act

[1] Formerly known as the Jordan Cove Energy Project
[2] 40 CFR §230.60-230.61
[3] 40 CFR §227.12-227.13

☑ Section 103, Marine Protection, Research and Sanctuaries Act
☐ Comprehensive Environmental Response, Compensation, and Liability Act

Discharges of dredged or fill material into waters of the U.S., regulated by the Corps under section 404 of the Clean Water Act (CWA), are the primary focus of this SDM. Discharges of pollutants into waters of the state (regulated by the Oregon Department of Environmental Quality [ODEQ] under section 401 of the CWA) are also considered herein. The transport and disposal of dredged material into ocean waters, regulated by the EPA and Corps under section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA), are also briefly touched upon, because ocean disposal will be required for the maintenance of the JCLNG terminal.

This SDM documents the suitability of dredged and excavated sediments from the JCLNG-PCGP Project for unconfined, aquatic disposal. With the exception of the mercury testing along the PCGP (~MP 109), all sampling and analysis plans and subsequent sediment quality data were reviewed by the interagency PSET (or previous incarnations, the Project Review Group [PRG; 2008-2011] and the Regional Management Team [RMT; 1998-2007]). In this evaluation the PSET reviews all available sources of sediment quality data (see Section 1.4) and provides a determination of its suitability. Because sediment sampling was not conducted throughout the entire JCLNG-PCGP project, the PSET also looks to the CWA sediment testing regulations to determine if additional sediment testing is necessary.

Temporary and permanent facilities constructed in uplands, outside federal CWA jurisdiction, are not considered in this SDM. Upland facilities not considered include (but are not limited to):

- Pipeline installed in upland
- Upland parts of the LNG terminal
- Construction staging areas
- Power stations
- Main line valves
- Metering stations
- Compressor stations
- Communication arrays

Numerous documents were provided by the Regulatory Branch for the PSET's review. A list of these documents appears in Section 9 of this SDM.

2.0 Project Description. Due to the complexity of the proposed action, the project was distilled into three elements for the sediment evaluation:

- Proposed JCLNG marine slip and terrestrial wetland impacts
- Wetland and stream crossing impacts associated with the proposed PCGP
- Wetland and stream impacts associated with mitigation proposed for the JCLNG-PCGP project

These project elements are described in greater detail below.

2.1 JCLNG Marine Slip and Terrestrial Wetland Impacts.

Marine Slip Impacts – Construction of the access channel and slip for the JCLNG export terminal would generate about 5.6 million cubic yards (mcy) of dredged and excavated material (Table 1; Figure 1). Of the 5.6 mcy, about 2.3 mcy would be dry excavated in the proposed slip area north of and behind an earthen berm separating work in the upland from the bay during Phase 1 of the marine slip construction. Also in the upland area north of the berth, during "Fresh Water" Phase 2 construction of the slip, up to about 1.5 mcy of material would be dredged in the pocket behind the berm. About 0.5 mcy of material would be dredged during removal of the berm, during the "Salt Water" Phase 3 construction of the slip. Lastly, about 1.3 mcy of material would be dredged from the bay during

construction of the access channel between the current Coos Bay navigation channel and the proposed Jordan Cove terminal marine slip.

TABLE 1 – **Materials Excavated and Dredged During Construction of Terminal Marine Facilities**			
Area	**Construction Phase**	**Activity**	**Volumes (mcy)**
Slip	Upland - Phase 1	Land-based excavation	2.3
Slip	Fresh Water - Phase 2	Dredging in pocket behind berm	Up to 1.5
Slip	Salt Water – Phase 3	Dredging to remove berm	0.5
Access Channel	Salt Water – Phase 3	Dredging in bay	1.3
		Total:	**5.6**



Figure 1. JCLNG Marine Slip and Access Channel.

Most of the 5.6 mcy of material excavated from the slip and access channel would be used to raise the elevation of the proposed terminal facilities above the tsunami inundation zone (JCLNG discharges into terrestrial wetlands are described in the next section). A total of about 1.9 mcy would be placed on the LNG terminal upland process area. About 0.5 mcy of material from the removal of the berm between the northern portion of the slip and Coos Bay would be used for restoration of a dune on the east side of the slip area. The remaining materials (about 3.2 mcy) would be deposited at the former Weyerhaeuser linerboard site, which is the proposed location for the pipeline gas treatment facility and South Dunes Power Plant. The elevation of the base of the proposed LNG storage tanks would be raised to +30 feet, while the elevation of the process area at the terminal would be raised to about +46 feet. The elevation of the proposed South Dunes Power Plant area would be raised to about +46 to +48 feet.

Terrestrial sediment and soils would be excavated with conventional earthmoving equipment and transported by dump truck. The materials dredged from the proposed terminal slip and access channel would be slurried through a 20-inch polypropylene pipeline following the Coos Bay shoreline approximately 8,700 feet east to a nearby upland facility (the Weyerhaeuser linerboard mill site).

The proponent's preferred location for dredged material disposal is the ocean dredged material disposal site (ODMDS), Site F (Figure 2). In 2006, EPA designated Site F under section 102 of the MPRSA, primarily to handle dredged material from the Coos Bay federal navigation channel (FNC). The EPA and Corps jointly manage Site F for federal channel maintenance and disposal permitted by the Regulatory Branch (with EPA concurrence). Under regulatory permits, the maximum amount of material disposed at Site F was 25,200 cy in 2012 (permit No. NWP-2007-5). Prior to using this site, both the EPA and Corps have stipulated that the proponent must conduct a site capacity study that accounts for disposal of FNC maintenance material and other dredged material disposal permitted by the Corps.

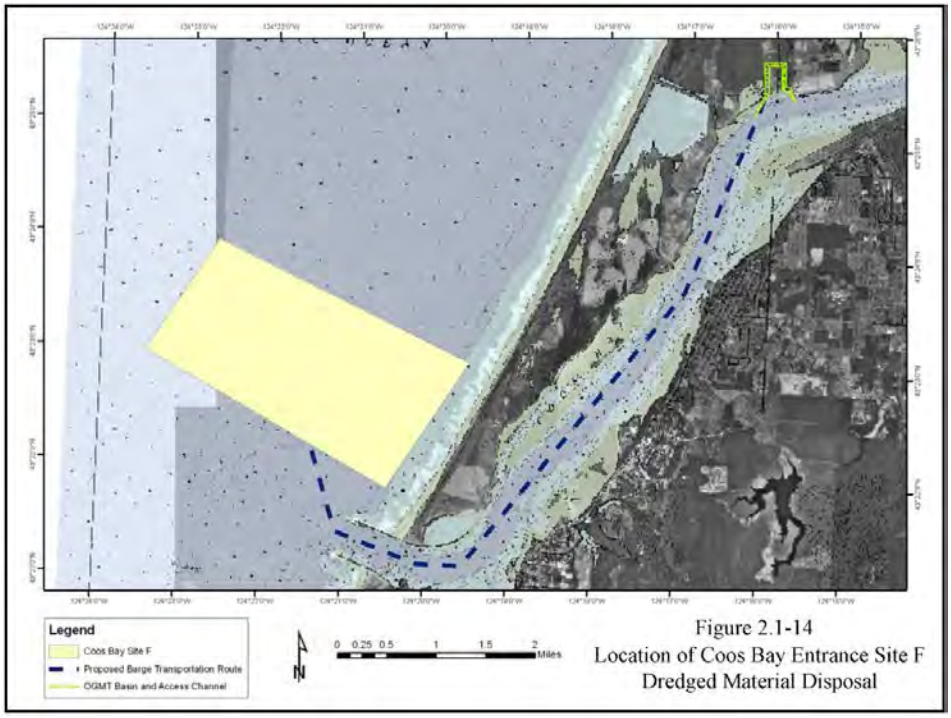

Figure 2. Coos Bay ODMDS, Site F.

Approximately 29.3 acres of estuarine habitat would be excavated to construct the marine slip and access channel (Table 2). Mitigation is proposed for the intertidal and shallow subtidal habitat impacts; mitigation is not proposed for excavation in the deep, subtidal zone.

Terrestrial Wetland Impacts – The JCLNG (through their consultant, SHN Consulting Engineers and Geologists, Inc.) conducted wetland delineations within the LNG terminal site as well as the South Dunes Power Plant site, temporary construction worker camp, and other associated facilities (see Chapter 2 of the FEIS for details regarding these facilities. The JCLNG terrestrial wetland construction and permanent impacts are summarized in Table 2; wetland locations are shown in Figure 3. The Corps has reviewed and concurred with JCLNG's wetland delineation on March 13, 2014.

Most of the impacted wetlands would be permanently filled during construction, thereby severing any hydrologic connection between filled wetlands and the bay. As noted above, the material used to construct the upland portion of the JCLNG will all come from the JCLNG slip and access channel excavation.

TABLE 2 – **Wetlands Delineated on the JCLNG Site**

Wetland Delineation	Cowardin Wetland Class		Areas Affected By Construction (acres)	Areas Affected By Operation (acres)
Slip and Access Channel				
Eelgrass	E2AB		2.5	2.5
Intertidal (MHHW)	E2US		8.1	8.1
Shallow Subtidal	E1UB		3.3	3.3
Deep Subtidal a/	E1UB		15.4 a/	15.4 a/
		Subtotal	**29.3**	**29.3**
Construction Dock				
Intertidal	E2US		1.9	1.4
Shallow Subtidal	E1UB		0.2	<0.1
Eelgrass Habitat a/	E2AB		0.3 a/	0.0 a/
		Subtotal	**2.4**	**1.5**
LNG Liquefaction Site				
2013-4	PSS		0.3	0.3
2013-3	PSS		0.1	0.1
		Subtotal	**0.4**	**0.4**
Access /Utility Corridor				
Wetland C	PFO		0.2	0.2
Wetland E	PAB		1.0	0.2
2013-6	PEM		0.3	<0.1
2012-2	PSS, PEM		0.2	0.0
2013-1	PUB, PSS, PEM		<0.1	<0.1
2013-2 a/	PUB, PSS, PEM		<0.1 a/	<0.1 a/
		Subtotal	**1.79**	**0.53**
Construction Worker Camp				
Wetland APC-A2	E2EM		0.2	<0.1
Wetland APC-D	PEM		<0.1	<0.1
Coos Bay, below el. 746´ (MHHW)	E2UB		<0.1	<0.1
		Subtotal	**0.3**	**<0.1**
South Dunes Power Plant				
Wetland F a/; b/	PUB		0.9 a/; b/	0.9 a/; b/
Wetland G a/; b/	PUB		0.9 a/; b/	0.9 a/; b/
Wetland H (East)	PEM		<0.1	<0.1
Wetland H (West)	PEM		<0.1	<0.1
Wetland I (North)	PEM		0.3	0.3
Wetland I (South)	PEM		<0.1	<0.1
Wetland J	PEM		<0.1	<0.1
Wetland L	PEM		0.1	0.1
Wetland M	E2UB		0.2	0.2
2012-7	PEM		0.2	0.2
Coos Bay, below el. 746´ (MHHW)	E2UB		0.5	0.5
		Subtotal	**3.2**	**3.2**
Rail Spur Bridge Relocation				
2012-4	PEM		<0.1	<0.1
		Subtotal	**<0.1**	**<0.1**
Southwest Oregon Regional Safety Center				
Wetland A	PFO		0.2	0.2
Wetland B	PFO		0.4	0.4
		Subtotal	**0.6**	**0.6**
Impact Summaries				
		Total Wetland Impacts	**38.0**	**35.6**

Cowardin (1979) aquatic habitat classes: E2AB = intertidal estuarine aquatic bed; E2US = intertidal estuarine unconsolidated shore; E1UB = subtidal estuarine unconsolidated bottom; PSS = palustrine scrub-shrub; PFO = palustrine forested; PAB palustrine aquatic bed; PEM = palustrine emergent

Note that values may not sum correctly due to rounding. Acreages for wetlands are rounded to the nearest tenth of an acre; values below 0.1 acre are noted as <0.1.

a/ These areas are not included in the mitigation requirements, and no mitigation for these areas has been proposed by Jordan Cove.

b/ These are jurisdictional wetlands but do not require mitigation as these former mill waste treatment areas under an ODEQ closure plan.

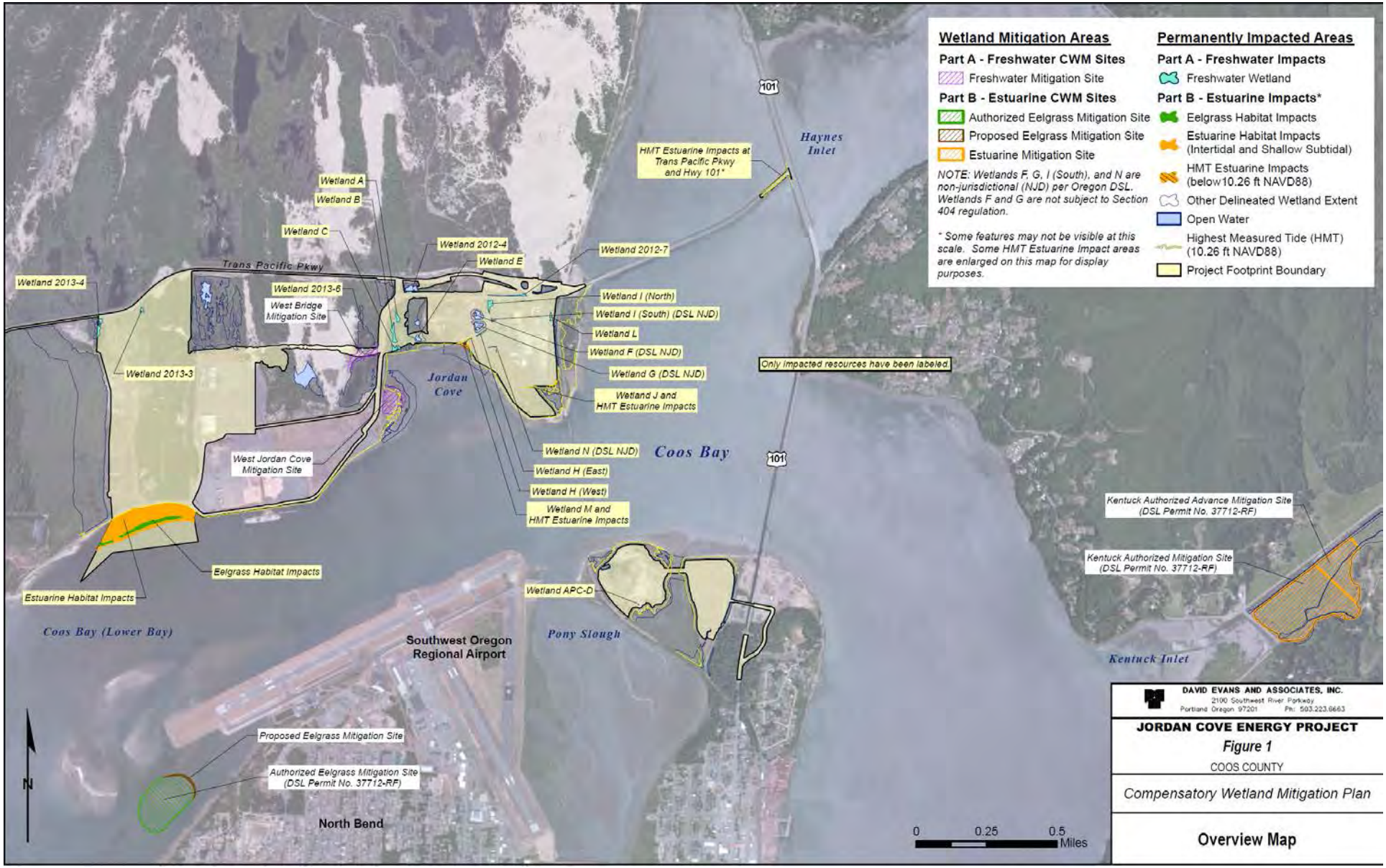

Figure 3. Delineation of Waters of the U.S. at the JCLNG and Proposed Compensatory Wetland Mitigation Sites.

2.2 PCGP Impacts. The proponent proposes to construct and operate an approximately 232-mile long, high-pressure, underground, welded steel, natural gas pipeline, and associated aboveground facilities (Figure 4). The pipeline would cross portions of Klamath, Jackson, Douglas, and Coos Counties, Oregon. For about 40 percent of its route (93 miles), the pipeline would be adjacent to existing powerlines, roads, and other pipelines with the remaining distance being newly created "green-field" right-of-way. The pipeline would be designed to flow natural gas from east to west, from its beginning point near Malin, Oregon, to the JCLNG terminal on Coos Bay.

Estimated wetland disturbances (from construction activities) and permanent wetland fills are summarized in Table 3. Numerous streams would be crossed by the PCGP; stream crossing information (nearest cleanup sites; type of waterbody; milepost, excavation methods, crossing dimensions, rationale for preferred crossing method; fisheries information; and contaminants information) is included in Attachment A at the end of this SDM.

TABLE 3 – **Summary of Wetland Impacts along the PCGP**

Wetland Type	Total Construction Disturbance in Wetland (acres)	Wetland Vegetation Affected by Fill or Located Within Permanent Operational Corridor (acres)	Wetland Impacts Considered by FERC to be a Long-Term Permanent Impact (acres)
Palustrine unconsolidated bottom and aquatic beds	6.3	0.0	0.0
Palustrine emergent wetlands	137.7	0.0	0.0
Palustrine forested wetlands	5.2	1.4	3.9
Palustrine scrub-shrub wetlands	1.2	0.1	1.1
Riverine wetlands	12.2	0.0	0.0
Estuarine	76.3	0.0	0.0
Lake	<0.1	0.0	0.0
Total Wetland Impact	**239.0**	**1.5**	**4.9**

Note that values may not sum correctly due to rounding. Acreages for wetlands are rounded to the nearest tenth of an acre; values below 0.1 acre are noted as <0.1.

a/ Includes wetlands that would be allowed to restore to preconstruction conditions (i.e., they would not be filled, nor would they be located within the permanent 10-foot-wide operational corridor); however, it could take many decades for conditions within these wetlands to restore to preconstruction conditions.

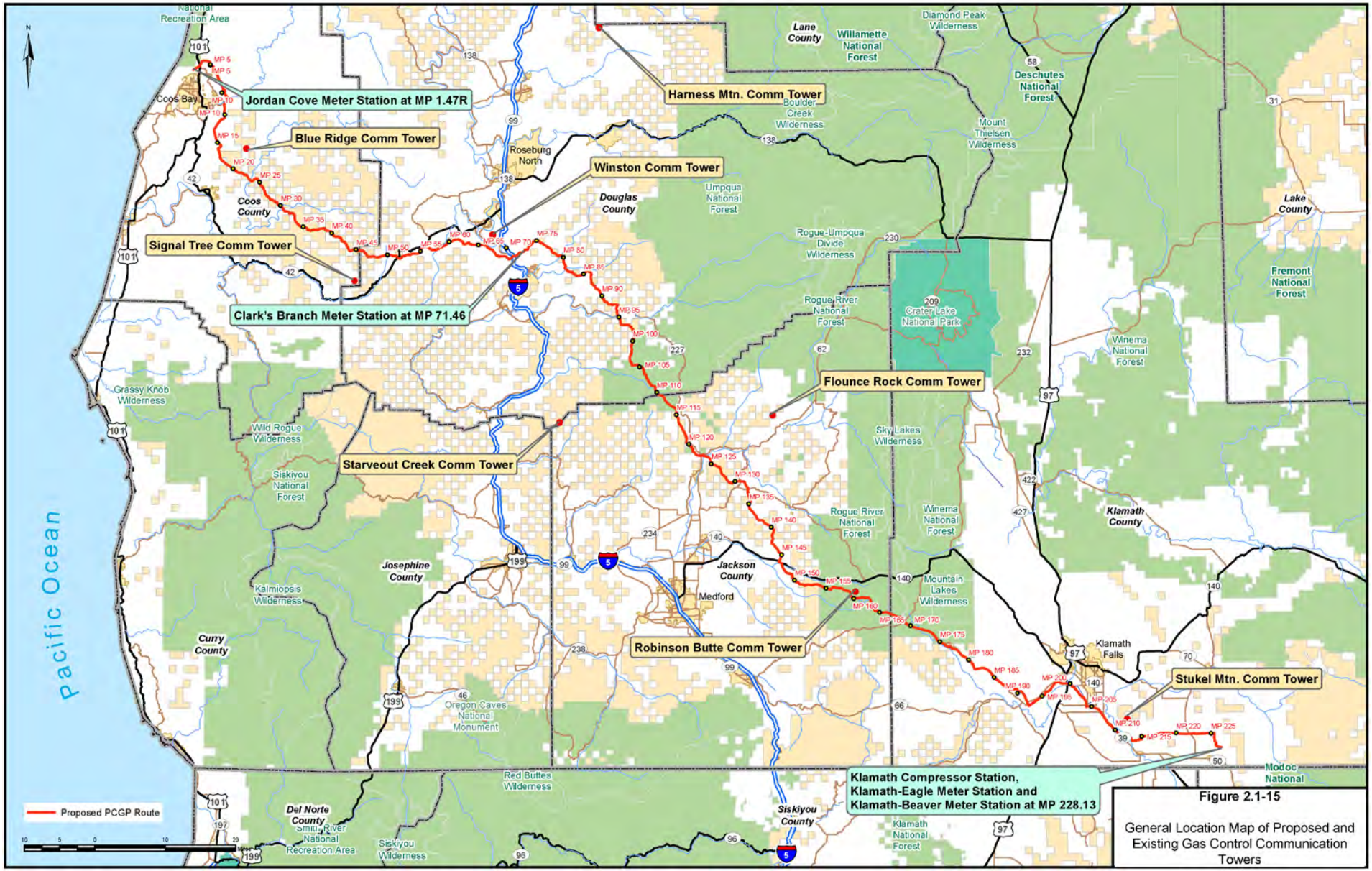

Figure 4. Pacific Connector Gas Pipeline Proposed Route.

2.3 Compensatory Mitigation for the JCLNG-PCGP.

JCLNG Mitigation – The proposed JCLNG mitigation sites appear in Figure 3. As part of its freshwater wetland mitigation proposal, Jordan Cove would include about 2.9 acres of wetlands at the West Jordan Cove mitigation site and about 1.6 acres of wetlands and the West Bridge Site, both located on the east side of the Roseburg Forest Products property. Impacts to estuarine wetland resources would be mitigated via the in-bay Eelgrass Mitigation Site and Kentuck Slough Mitigation Site for total of approximately 50.8 acres of mitigation. The in-bay Eelgrass Mitigation Site is located south of the airport's west runway. The Kentuck Slough Mitigation Site is located south of Glasgow, Oregon (Figure 5).

PCGP Mitigation – The PCGP plans to mitigate wetland impacts along the pipeline right-of-way (ROW) at the Kentuck Slough Mitigation Site. Eelgrass restoration is also planned along the pipeline ROW at the Haynes Inlet crossing. Within the southeast part of the former Kentuck Golf Course, the PCGP would enhance approximately 4.3 acres of degraded, freshwater pasture wetland in the southeast part of the site (Figure 5). The freshwater wetlands abut brackish-water wetlands (situated adjacent to the Kentuck Slough). PCGP would enhance the freshwater wetland area by changing the wetland type to freshwater, native forested wetland. Mitigation enhancement components include:

- Removal of manmade ditches and berms
- Reroute flow within the ditches via excavated channels
- Remove non-native vegetation
- Install elevated habitat berms
- Plant red alder and Sitka spruce and wetland understory shrubs and herbaceous species

The PCGP would minimize wetland impacts through the following measures:

- Construction efforts would be scheduled for drier seasons
- Hazardous materials, fuels, and oils would not be stored in a wetland or within 150 feet of a wetland
- The top 1 foot of topsoil would be segregated from the subsoil in the area disturbed by trenching, except where standing water is present or soils are saturated or frozen. Immediately after backfilling, the segregated soil would be restored to its original location
- Vegetation would be cut just above ground level to leave the existing root system in place. Tree stump removal and grading would occur directly over the trench line. Stumps would not be removed from the rest of the right-of-way unless required for safety reasons
- Construction equipment operating in the wetland would be limited to that needed to clear vegetation, dig trenches, install the pipe, backfill, and restore the right-of-way. Other equipment would use upland access roads to the maximum extent possible. Travel would be restricted across wetlands where topsoil was restored
- Low ground-weight equipment would be used in saturated wetlands or the normal equipment would be operated on prefabricated equipment mats
- Slope breakers and sediment controls would be installed and maintained on slopes greater than 5 percent that are less than 50 feet from a wetland
- Erosion control devices would be installed and maintained as necessary to prevent sedimentation and runoff from entering wetlands
- Trench breakers would be installed, or the bottom of the trench would be sealed as necessary, to maintain the original wetland hydrology

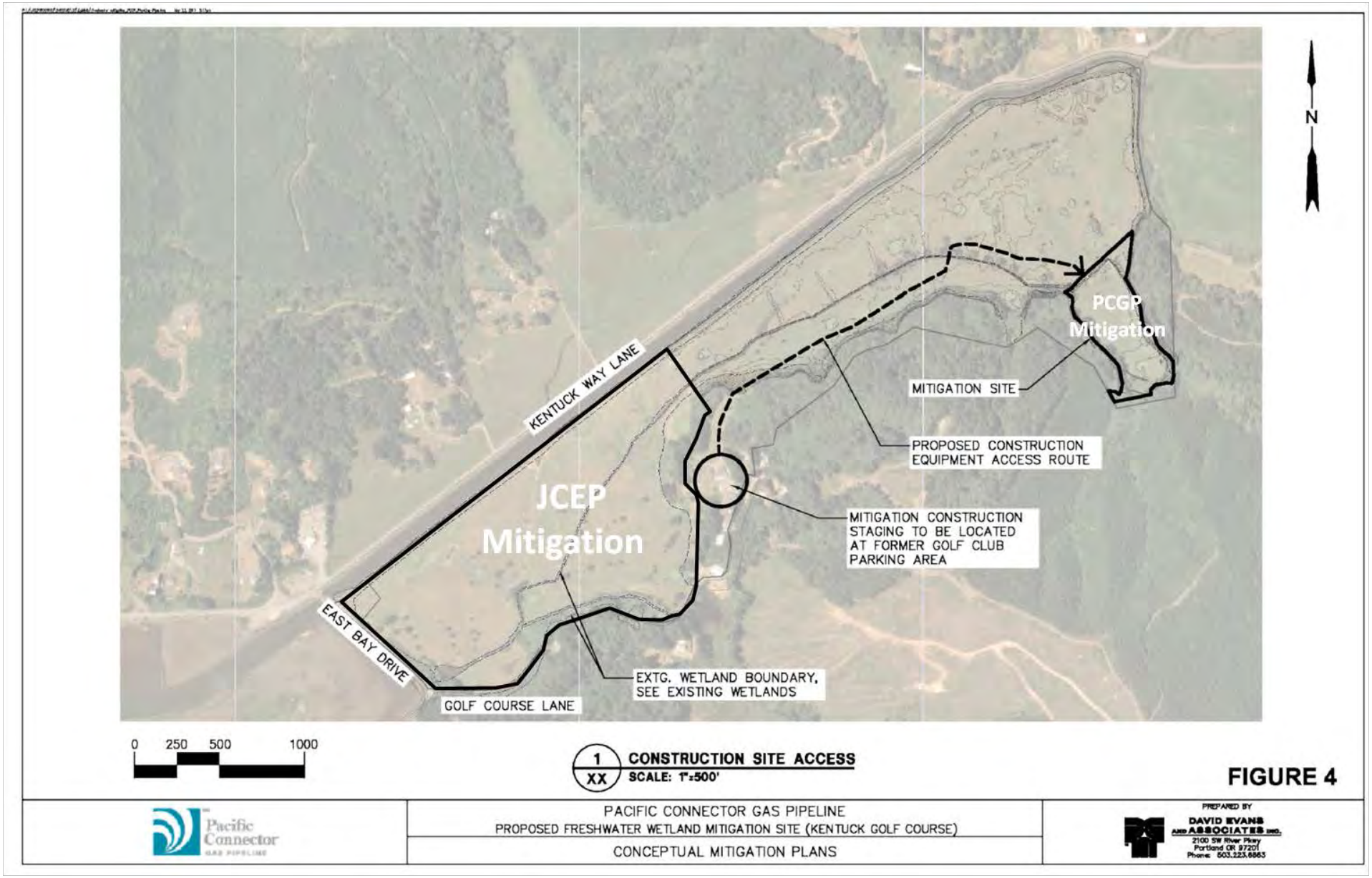

Figure 5. JCLNG and PCGP Compensatory Wetland Mitigation Areas at Kentuck Slough.

- Appropriate weed-free live seed mixtures would be used for revegetation. No fertilizers would be used in wetlands; native trees and shrubs would be replanted during restoration of wetlands within riparian areas
- Wetlands would be monitored after revegetation for 3 years after construction or until the revegetation is successful. Revegetation would be considered successful when 80 percent of the type, density, and distribution of species are similar to that of adjacent unaltered wetlands. If revegetation is not successful at the end of 3 years, Pacific Connector would develop and implement a remedial revegetation plan to actively revegetate the wetland and would continue revegetation efforts until wetland revegetation is successful
- Vegetation maintenance would not be conducted over the full width of the operational right-of-way within wetlands, but limited to a 10-foot-wide corridor

3.0 Level 1 Site History Information. Land use information appears in Section 4.1 of the FEIS. Environmental cleanup sites (identified in ODEQ's Environmental Cleanup Site Information [ECSI] database) for both the JCLNG and PCGP listed by pipeline milepost in Attachment A; ECSI sites in or near the JCLNG appear at the beginning of Attachment A.

3.1 JCLNG Site History Information

Land Use – Virtually all of the JCLNG upland elements are on privately owned lands. No federal lands would be utilized for the JCLNG. However, the JCLNG proposes to acquire one parcel from the Oregon International Port of Coos Bay (OIPCB). In addition, some components are situated within waters of the State of Oregon. The majority of the waterway for LNG vessel marine traffic, the access channel to the terminal, and the eelgrass mitigation area would be located in Coos Bay. The bay is considered waters of the State, with the bottom of the bay managed by DSL.

Historically, the LNG terminal tract was once part of the Henderson Ranch, dating back to the 1860s. In the 1880s, the Henderson Ranch was acquired by the Luse family, who later sold it to the Southern Oregon Improvement Company. Later, the Peterson family operated a dairy farm in the area in the early twentieth century, and continued to run cattle on the North Spit until the late 1950s. The terminal tract, then referred to as the Ingram Yard, was acquired by the Menasha Wood Ware Corporation, and was sold to Weyerhaeuser in 1981. The Ingram Yard was used for log sorting and disposal of debris from operation of the mill. In the early 1970s, the Corps deposited dredged material from the Coos Bay FNC at the Ingram Yard.

The site of the proposed North Point Workforce Housing Project (located on east of the airport on the south bank of Coos Bay, Figure 3) is owned by Al Pierce Lumber Company, and would be leased by Jordan Cove. It is zoned for heavy industry according to the North Bend Municipal Code and is classified as industrial land. The site is currently unoccupied and undeveloped. Previously, the site was used for dredged material disposal on the western portion and log storage on the eastern portion.

Due to the potential to encounter contaminated soils in the terrestrial parts (including terrestrial wetlands) of the LNG terminal site, JCLNG conducted multiple Phase I and Phase II environmental site assessments (ESAs). Phase I protocols consist of record searches, inventories, site visits, and other methods, but are not intrusive. Phase II protocols consist of intrusive sampling. Phase II ESAs were conducted to address the findings of the Phase I ESAs. Summaries of these ESAs appear in the FEIS, Section 4.3.1.3 (Soil Limitations).

Cleanup Sites – Cleanup sites in or near the JCLNG and their descriptions appear in Attachment A. Two sites were identified in the ECSI database: ECSI Site No. 1083 (Weyerhaeuser Mill Site) and ECSI Site No. 4704 (Weyerhaeuser Ingram Yard). Remedial actions at these sites are described in Attachment A. On 15 September 2006, both of these sites received a joint "No Further Action" letter from ODEQ's Cleanup Program. A work plan for full regulatory closure of these sites, providing full contaminant removal and/or containment, was also prepared by GRI (2013); key elements of the site closures are summarized in Attachment A.

The northern third of the Ingram Yard site contains ash and sludge with concentrations of polychlorinated biphenyls (Aroclors) detected at up to 89 µg/kg. Phthalates were also detected at concentrations well above the SEF marine SLs (e.g., bis-2-ethylhexyl-phthalate concentrations ranged from 2.7 to 4.9 mg/kg; the SEF marine SL is 1.3 mg/kg) (CH2MHill, 1996).

Prior Sediment Testing – The Corps has conducted physical and chemical characterization of Coos Bay FNC sediments since 1980. Sediment sampling near the JCLNG (between channel miles 6.0 and 9.0) occurred in 1989, 1998, 1999, 2005, 2010, and 2014. Physical analysis of sediment samples collected by the Corps indicates that the materials near the JCLNG are predominantly sands with varying amounts of gravel and silt. These grain-size data indicate that sediment near the project area is generally coarse-grained and are less likely to contain contaminants as compared to fine-grained sediments. The chemical analytical data from the Corps FNC indicate that chemicals of concern present near the project area generally include metals, phenols, various phthalates and PAHs.

Roseburg Forest Products (RFP) operates a marine terminal on the north side of the Coos Bay at channel mile 7.9, directly upstream of the proposed JCLNG marine slip and access channel. RFP's berth was evaluated in 1997; concentrations of semi-volatile organic compounds (SVOCs) and tributyltin (TBT) exceeded the regional sediment quality guidelines. Bioaccumulation testing was conducted on the project sediments and the sediments were considered suitable for unconfined, aquatic disposal. The berth was evaluated in 1999 and TBT results were similar to 1997; based on the 1997 bioaccumulation results, the sediments were determined to be suitable. The berth was evaluated in 2002 and again in 2005; TBT concentrations did not exceed the marine benthic toxicity screening level (SL1 = 0.15 ug/L, porewater) in either sampling event. The berth was tested in 2009 and TBT was detected above the SL1 in the west part of the berth; discrete re-sampling did not detect TBT and dredging was restricted to the eastern portion of the berth. RFP's berth was sampled again in 2010 and 2015; TBT was not detected during either sampling event, and the sediments were determined to be suitable for unconfined, aquatic disposal.

3.2 PCGP Site History Information.

Land Use – Approximately 64 percent of the land that would be crossed by the pipeline is classified as forest, 17 percent is agricultural land and 10 percent is rangelands. Water, wetlands, and barren lands comprise about 2 percent of the proposed route. Only 7 percent of the proposed right-of-way is composed of urban or built-up lands with varying uses.

North of Medford, Oregon, prospecting and exploration activities for mineral mercury (cinnabar) occurred on the Umpqua National Forest during the late 1920s through the early 1940s. A group of mercury mining claims is located along the PCGP ROW between MP 108.7 and 109.2 (Figure 6). The pipeline ROW cuts through the eastern unit of the Thomason group of mining claims; this unit was not known for producing substantial amounts of mercury. The principal mercury producer in the area was the Red Cloud mine, located west and southwest of the pipeline ROW. This property produced at least 6

flasks (and possibly as many as 63 flasks) of elemental mercury (quicksilver). Mercury was extracted by roasting the cinnabar-bearing vein material on-site (Broeker, 2010). Mercury sampling results from this area are summarized in Section 4.2, below.

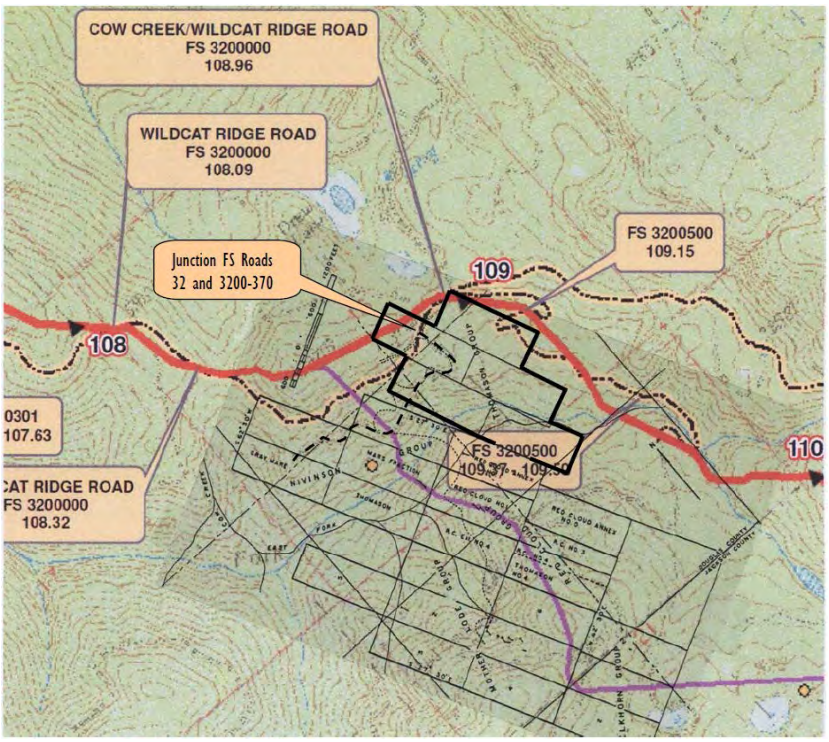

Figure 6. Thomason group of mining claims for mineral mercury, PCGP MP 109.

No known contaminated sites would be crossed by the pipeline; therefore, contact with contaminated soils during pipeline construction is not anticipated. Pacific Connector has developed a "Contaminated Substances Discovery Plan" that specifies measures that would be implemented if unanticipated, contaminated soils are encountered. Some of the measures outlined in that plan include:

- Ceasing all construction work in the immediate vicinity of areas if hazardous or unknown wastes are encountered
- Construction, oversight, and observing personnel would be evacuated to a road or other accessible up-wind location until the types and levels of potential contamination can be verified
- If an immediate or imminent threat to human health or the environment exists, one of PCGP's emergency response contractors or the National Response Team would be notified and mobilized

Cleanup Sites – ECSI Site No. 583, the Roseburg Forest Product's Hult Chip Yard, is located off the proposed pipeline ROW near MP 67; in 1985 approximately 8,000 gallons of fuel were released from a ruptured tank. Details of the cleanup appear in Attachment A.

ECSI Site No. 655, a former Weyerhaeuser sawmill (currently Collins Forest Products), is located south of the ROW near MP 198 (near Klamath Falls, Oregon). Contaminants identified at the site include arsenic, chromium, copper, mercury, polynuclear aromatic hydrocarbons, and petroleum hydrocarbons. Site details appear in Attachment A.

ECSI Site No. 2878, DG Shelter Products, is also near Klamath Falls, Oregon. This site, located near a portion of the Klamath River, was added to ODEQ's ECSI database for tracking purposes. Site screening was recommended and completed in 2001. Currently, there are no additional actions listed for the site. Other site details appear in Attachment A.
ECSI Site No. 2785, Mac's Store is located south of Klamath Falls, Oregon, in Klamath County, due east of MP 206.0. Due to a suspected underground fuel spill, the site was recommended for screening in 2001. ODEQ has determined that no further action is required to address contamination at the site. Other site details appear in Attachment A.

Prior Sediment Testing – Aside from cleanup site investigations along the PCGP (listed above), no other sediment sampling was noted in the FEIS.

3.3 JCLNG-PCGP Mitigation Site History Information.

Land Use – Land use for the West Jordan Cove and West Bridge freshwater mitigation sites is described in Section 3.1, above. The Kentuck Slough mitigation site was formerly a golf course and is located below the mean high water mark for Coos Bay. The site is maintained in the dry by the fill beneath East Bay Drive, which channelizes the slough to the northwest of the golf course. Kentuck Slough was originally a salt water marsh that was diked and filled between 1939 and 1961 for use for agriculture, logging, and gravel quarrying. The southeastern portion of the site that would be used to mitigate PCGP impacts consists of freshwater pasture wetlands. The golf course was built in the 1960s and is located adjacent to the Coos Bay Channel and Kentuck Slough. The golf course is not open and there are no plans to resume operation. Pesticides and herbicides were applied to the golf course in the past. Pesticides are no longer in use, but recent practice has been to use Round-Up, a glyphosate-based, broad-leaf herbicide for weed control.

Cleanup Sites – No cleanup sites were identified near either the Kentuck Slough or in-bay eelgrass mitigation sites. ECSI Site Nos. 1083 and 4704 (Weyerhaeuser Mill Site and Ingram Yard, respectively) are far removed from the West Jordan Cove and West Bridge freshwater mitigation sites; potential sources from these cleanup sites do not likely contribute contaminants to these proposed mitigation areas.

Prior Sediment Testing – No prior sediment testing has occurred at the Kentuck Slough mitigation site. Aside from sediment sampling in the adjacent Coos Bay FNC (see SDM Section 3.1), no sediment testing has occurred in or near the in-bay eelgrass mitigation site.

4.0 JCLNG-PCGP Sediment Characterization. Between 2006 and 2014, several investigations were conducted to characterize sediments in the in-water portions of the JCLNG-PCGP project; the results of these events are summarized below. Future requirements for sediment testing are described in Section 5.0 of this SDM.

4.1 JCLNG Sediment Characterization.

In-Bay Sampling, Access Channel and Marine Slip – In October 2006, SHN Consulting Engineers & Geologists, Inc. (SHN) sampled the bayward, estuarine sediments and subsurface sediments (physical characterization only) in the footprint of the JCLNG access channel and outer part of the marine slip. Twenty-one samples (representing approximately 1.9 mcy) were analyzed for grain size and total volatile solids (TVS); the samples were stratified throughout the berth and access channel). The sand content in all 21 samples was >99%; TVS ranged from 0.50 to 2.74% (SHN, 2007). Based on the physical results, no

chemical testing was required by the RMT, as documented in their 24 April 2007 suitability determination memorandum.

Sediment investigations at the cleanup sites identified near the JCLNG are described in Attachment A. Terrestrial site investigations are briefly summarized in Section 3.1, above.

4.2 PCGP Sediment and Soil Characterization

Haynes Inlet Pipeline Crossing – In June 2010, GeoEngineers collected three composite samples (composed of three subsamples) from along the Haynes Inlet pipeline crossing in the Coos Bay estuary (MP 1.7R to 4.1R). Metals, most SVOCs (including PAHs), pesticides, and PCBs were not detected; diethyl phthalate and bis(2-ethylhexyl)phthalate were detected at concentrations well below their respective marine SLs (GeoEngineers, 2010). The Haynes Inlet pipeline crossing sediment was determined to be suitable for unconfined, aquatic placement by the PRG on October 7, 2010.

Cow Creek Mercury Investigations – Because mercury mineral deposits are naturally-occurring throughout the area around MP 109, background concentrations are also elevated in soils and sediment. Three in-stream sediment samples were collected along the pipeline ROW, one from the East Fork of the Cow Creek and two from its tributaries, and analyzed for mercury and other heavy metals. Mercury concentrations ranged from 0.06 mg/kg to 0.29 mg/kg. The regional freshwater benthic toxicity screening level (SL) for mercury is 0.66 mg/kg. Soil mercury concentrations at the Red Cloud Mine (located >1,000 feet outside of the ROW) ranged from non-detect (detection limit = 0.02 mg/kg) to 60.1 mg/kg, nearly 100 times the SL (Broeker, 2010).

Sediment investigations at the cleanup sites identified along the PCGP are described in Attachment A. No other sediment investigations were provided along the length of the channel.

4.3 JCLNG-PCGP Mitigation Sites Sediment Characterization

West Jordan Cove and West Bridge Freshwater Mitigation Sites (JCLNG) – To our knowledge, these site sediments have not been chemically characterized.

Kentuck Slough Mitigation Site (JCLNG & PCGP) – The Kentuck Slough Mitigation Site was sampled in November 2010. The mitigation site was divided into four units, and four composite samples (composed of 3 subsamples each) were submitted for physical and chemical analysis (SEF full suite). Four samples from the intertidal channel were also submitted for physical and chemical analysis; dimethyl phthalate concentrations in one sample, C-5 (79 µg/kg), exceeded the marine SL (71 µg/kg) (GRI, 2011). In their SDM dated 1 June 2011, the PRG determined that channel sediments at sample location C-5 were unsuitable for unconfined, aquatic exposure; sediment characterized by other samples was determined suitable for unconfined, aquatic exposure.

Revisiting the November 2010 Kentuck Slough data, GRI believed that sample C-5 was contaminated with phthalates by the gloves used during sample processing. To provide a weight-of-evidence to support their supposition, GRI resampled the area around point C-5 in September 2014. One surface and one subsurface sample were collected from station C-5; surface and subsurface samples were collected from two stations directly adjacent to station C-5. The 6 samples were submitted for phthalates analysis (samples were not composited). No phthalates were detected in the re-analysis and all detection limits were below the respective marine SLs (GRI, 2014a). In this SDM, the PSET has determined that the channel material at station C-5 is suitable for unconfined, aquatic exposure (along with the rest of the channel).

JCLNG proposed to expand the Kentuck Slough Mitigation Site to include an unnamed pond south of Golf Course Lane (and south of the mitigation site). In September 2014, the pond was sampled for physical parameters and the full suite of SEF chemicals of concern. Though chemicals of concern were not detected during this investigation, method detection limits were well above the SEF marine SLs for the following compounds (GRI, 2014b):

- Dieldrin
- n-Nitrosophenylamine
- Hexachlorobutadiene
- Benzyl alcohol
- Benzoic acid
- 1,2-Dichlorobenzene
- 1,2,4-Trichlorobenzene
- Hexachlorobenzene
- 2-Methylphenol
- 2,4-Dimethylphenol
- Pentachlorophenol

According to the SEF, if a chemical of concern is not detected by the laboratory, and the method detection limit is elevated above the screening level, then the material is determined to be unsuitable for unconfined, aquatic exposure. In this case, the method detection limits for 11 compounds were elevated above their respective screening levels. GRI's contract laboratory believes that the method detection limits were elevated due to the high total organic carbon content measured in the pond sediments. The PSET has determined that the pond sediments are not suitable for unconfined, aquatic exposure. Biological (bioassay) testing is required to further evaluate the suitability of these sediments.

The PCGP portion of the Kentuck Slough Mitigation Site has not been sampled or tested. However, it is similar to the JCLNG portion of the Kentuck Slough Golf Course. Given the limited amount of ground disturbance proposed for the PCGP, the PSET will not require additional testing for this area.

Eelgrass Mitigation Site (JCLNG) – The Eelgrass Mitigation Site was sampled by GRI in December 2010. Due to the sandy nature of material in the lower part of the estuary, physical screening was approved for this sediment characterization. Three subsamples were composited from the proposed mitigation site; the composite sample was analyzed for total solids (77%), total organic carbon (0.36%), and grain size distribution. The sediment was composed of approximately 90% sand and 10% fine-grained material; the sand fraction was predominantly fine sand (62% of the sample was composed of sands 0.125 to 0.25 mm in diameter). No additional characterization is required for this mitigation site.

Pipeline ROW Eelgrass Restoration – Eelgrass from adjacent donor sites will be used to restore eelgrass habitat along the pipeline ROW through Haynes Inlet. Pipeline sediments are suitable for aquatic exposure. No additional testing for eelgrass restoration was required by the PSET.

5.0 Management Area Rank, Data Recency, and Need for Re-Evaluation. The management area rankings and the recency of data for in-water components of the JCLNG-PCGP project are summarized in Table 4. The need for sediment re-evaluation is also documented in this table, along with supporting rationale. Upland sediments were only ranked if the material would be discharged into a water of the U.S. (as in the JCLNG fill).

If constructed, the JCLNG access channel and marine slip must be sampled prior to the first round of maintenance dredging. This area will be initially ranked "low"; the rank may change depending on the results of the first round of sediment characterization.

TABLE 4 - **SEF Management Area Rankings for the JCLNG-PCGP Project**

Project Component	Management Area Rank	Recency of Data	Re-Evaluation Date*	Rationale
Jordan Cove LNG				
In-bay Access Channel and Marine Slip (1.9 mcy)	Very Low/ Low (after construction)	10 years/ 7 years	October 2016 a/ Prior to 1st maintenance	Grain size data from the project site and no deep draft vessel usage support this rank determination.
Terrestrial Excavation of Marine Slip (3.7 mcy)	Low-Moderate	Not sampled	Not required b/	Per GRI's 2013 work plan, sources of contamination from the Weyerhaeuser Mill Site and Ingram Yard will be managed at an onsite landfill or removed to a DEQ-regulated landfill. Since contaminated sediment management is planned for the upper veneer of soil at the Ingram Yard site, the bulk of the material to be excavated and used onsite will likely be composed of uncontaminated, native sediment. Further, this excavated material will be placed in uplands and terrestrial wetlands and not provided with a direct hydrological connection to Coos Bay.
Pacific Connector Gas Pipeline				
Haynes Inlet (MP 1.7R to 4.1R)	Low	7 years	June 2017 c/	Sediment chemical results and the fine-grained nature of these sediments support this rank determination.
Stream Crossings – Historical Mercury Mining Area (MP 108.8 to 109.5)	Moderate	5 years	Not required d/	The occurrence of elevated concentrations of mercury near MP 109 supports this rank determination.
Stream Crossings – Remainder of PCGP (4.1R to 228.1)	TBD (varies)	Not sampled	Not required d/	Sampling (and ranking) will only be required if sources of contaminants are identified at stream crossings and the dissolved and suspended phases cannot be contained or managed.
JCLNG-PCGP Mitigation				
West Jordan Cove and West Bridge Mitigation Sites (JCLNG)	Low-Moderate	Not sampled	Not required	These terrestrial wetlands have no direct hydrological connection to the Coos Bay. Sources of contamination are far removed from these wetlands, and so risk of contamination is low. Sampling is not required.
Kentuck Slough Mitigation Site (JCLNG & PCGP)	Low	7 years	September 2021 c/	Sediment chemical results and the fine-grained nature of these sediments support this rank determination. Includes both the JCLNG and PCGP parts of the mitigation site.
Kentuck Slough Pond (JCLNG)	Moderate	5 years	September 2019 c/	Sediments are unsuitable for unconfined, aquatic exposure; bioassay testing must be conducted to support aquatic exposure of this material. Or, the contract laboratory must attain analytical detection limits below the marine SLs.
Eelgrass Mitigation Site (JCLNG)	Very Low	10 years	December 2020 c/	Grain size data from the project site and no deep draft vessel usage support this rank determination.
Eelgrass Restoration – Pipeline ROW (PCGP)	Low	7 years	Not required e/	Restoration of eelgrass beds along pipeline ROW; installation of eelgrass plugs from nearby donor sites.

* The need to resample must be evaluated prior to this date. If project conditions have not changed and new sources of contaminants have not been identified, then the PSET may extend the resample date. Conversely, if new contaminant sources are identified in or near the project area, additional sediment testing may be required prior to construction.

a/ Re-evaluation of the in-bay sediments is not required if the project is constructed before the listed date. However, if the slip is constructed, routine characterization of the shoaling material will be required prior to the first round of maintenance dredging. If new contaminant sources are identified in or near the project area, additional sediment testing may be required prior to construction.

b/ Sediment testing is not required for the terrestrial fills proposed for the JCLNG wetlands due to the low existing sediment contaminant levels in the wetlands, the ability of contaminants to migrate to abutting or adjacent water bodies, and proposed capping of sediments with supplemental clean fill material and impervious surfaces. If the slip is constructed, routine characterization of the shoaling material will be required prior to the first round of maintenance dredging.

c/ Re-evaluation of the in-bay sediments is not required if the project is constructed before the listed date. If new contaminant sources are identified in or near the project area, additional sediment testing may be required prior to construction.

d/ Sampling may be required if contaminant sources are identified in or near stream crossings, and suspended and dissolved contaminants cannot be managed. 40 CFR §230.60(c) states: "Where the discharge site is adjacent to the extraction site and subject to the same sources of contaminants, and materials at the two sites are substantially similar, the fact that the material to be discharged may be a carrier of contaminants is not likely to result in degradation of the disposal site. In such circumstances, when dissolved material and suspended particulates can be controlled to prevent carrying pollutants to less contaminated areas, testing will not be required." Material excavated to form the pipeline trench is used in the same area to bury the pipeline. Pipeline construction best management practices listed in the FEIS would ensure that "…dissolved material and suspended particulates [are] controlled to prevent carrying pollutants to less contaminated areas."

e/ Planned restoration activities are minimally invasive and do not require sediment testing.

6.0 Suitability Determination. Table 5 documents the suitability of the JCLNG-PCGP project sediments for unconfined, aquatic disposal or exposure. The need to re-test project sediments is summarized in Table 4, above.

TABLE 5 – **Suitability Determinations for the JCLNG-PCGP Project**

Project Component	Suitability Determination	Notes
Jordan Cove LNG		
In-bay Access Channel and Marine Slip (1.9 mcy)	Suitable	This material is suitable for offsite disposal.
Terrestrial Excavation of Marine Slip (3.7 mcy)	Suitable and Unsuitable Materials	The bulk of the material from the Ingram Yard is likely suitable. Only the upper veneer of soil has the potential to contain contaminants at concentrations of concern, and these will be managed during the regulatory closure process. The bulk of the material to excavated and used onsite is composed of native sediment that is likely uncontaminated. Wetlands filled by these sediments would be obliterated, and their hydrological connections severed from the Coos Bay estuary. Any residual contamination present in these excavated sediments would be effectively capped by impermeable surfaces associated with the LNG terminal.
Pacific Connector Gas Pipeline		
Haynes Inlet (MP 1.7R to 4.1R)	Suitable	Although this material would be redeposited at the point of origin, it is also suitable for offsite disposal
Stream Crossings – Historical Mercury Mining Area (MP 108.8 to 109.5)	Suitable for excavation and discharge at the excavation site	Offsite discharge of this material into waters of the U.S. is not allowed without additional sediment characterization.
Stream Crossings – Remainder of PCGP (4.1R to 228.1)	Suitable for excavation and discharge at the excavation site	Offsite discharge of this material into waters of the U.S. is not allowed without additional sediment characterization.
JCLNG-PCGP Mitigation		
Kentuck Slough Mitigation Site	Suitable	Sediments are suitable for unconfined, aquatic placement within the JCLNG and PCGP restoration project areas; channel sediments are suitable for unconfined, aquatic exposure.
Kentuck Slough Pond	Not Suitable	Laboratory detection limits were elevated above the marine SLs of 11 compounds; though reported as “non-detects” the material is assumed to be unsuitable. If detection limits below the SLs were attained, then the PSET would evaluate the new data.
Eelgrass Mitigation Site	Suitable	Sediments are suitable for unconfined, aquatic placement within the restoration project area; onsite sediments are suitable for unconfined, aquatic exposure.
Eelgrass Restoration – Pipeline ROW	Suitable	Material from the pipeline will be redeposited at the point of origin; eelgrass plugs from donor sites do not require sediment evaluation.

7.0 Reviewers

The reviewers of this project included:

☑ James McMillan (Corps, Lead) ☑ Bridgette Lohrman (EPA, Co-Lead)
☑ James Holm (Corps) ☑ Pete Anderson (ODEQ) ☐ Laura Inouye (Ecology)
☑ Tom Hausmann (NMFS) ☐ Jeremy Buck (USFWS)

This memorandum was prepared by James McMillan (PSET Lead), and reviewed by the participating PSET agencies, identified above. Questions regarding this memorandum should be directed to James McMillan at (503) 808-4376 or e-mail to: james.m.mcmillan@usace.army.mil.

8.0 References

U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, Washington Department of Ecology, Washington Department of Natural Resources, Oregon Department of Environmental Quality, Idaho Department of Environmental Quality, National Marine Fisheries Service, and U.S. Fish and Wildlife Service. 2009. *Sediment Evaluation Framework for the Pacific Northwest*. Published May 2009, by the U.S. Army Corps of Engineers, Northwestern Division, 128 pp + Appendices.

9.0 Project Documents Reviewed by the PSET

The PSET reviewed the following documents for this sediment evaluation:

JCLNG Documents

- 1 October 1996 "Phase II – Ingram Site Investigation, North Bend, Oregon" prepared by CH2MHill
- 15 September 2006 "No Further Action Determination, Former Weyerhaeuser Containerboard Mill, North Bend, Coos County, Oregon," prepared by ODEQ (includes the "Mill Site" and "Ingram Yard")
- January 2007 "Sediment Sampling and Analysis Report: Oregon Gateway Marine Terminal, Coos Bay, Oregon," prepared by SHN Consulting Engineers & Geologists, Inc.
- 3 July 2013 "Revised Work Plan for Joint Program Regulatory Closure: Settling Basins, Petroleum-Contaminated Soil, Asbestos Waste, and Mill Waste, Former Weyerhaeuser Mill Site and Ingram Yard Properties," prepared by GRI

PCGP Documents

- 23 August 2007 "Mine Hazards Evaluation and Mercury Testing at the Red Cloud, Mother Lode, Nivinson, and Elkhorn Mining Groups, Jackson and Douglas Counties, Oregon" and 2 October 2009 addendum, prepared by GeoEngineers
- 7 October 2009 "Level 1 Sediment Quality Assessment: Pacific Connector Gas Pipeline Project, Haynes Inlet, Oregon," prepared by GeoEngineers; this report includes summaries of Corps of Engineers sampling events conducted in 1980, 1990, 1993, 1994, 1998, and 2005
- 3 February 2010 "Potential for natural-occurring mercury mineralization to enter the aquatic environment between M.P. 109 and East Fork Cow Creek – Williams' Pacific Connector Gas Pipeline Project," prepared by L. Broeker, Consultant Geologist, Umpqua National Forest
- 2 August 2010 "Sediment Characterization: Pacific Connector Gas Pipeline Project, Haynes Inlet, Oregon," prepared by GeoEngineers
- January 2013 "Contaminated Substances Discovery Plan, Pacific Connector Gas Pipeline Project," prepared by Pacific Connector Gas Pipeline, LP

Mitigation Site Documents

- 7 January 2011 "Sediment Characterization Report: Eelgrass Mitigation Site," prepared by GRI
- 8 February 2011 "Sediment Characterization Report: Wetland Mitigation Site, Coos Bay, Oregon" (Kentuck Slough mitigation site), prepared by GRI

- May 2013 “Pacific Connector Gas Pipeline Compensatory Wetland Mitigation Plan” prepared by David Evans and Associates, Inc., for PCGP
- December 2013 “Estuarine Wetland/Open Water Restoration Plan: Pacific Connector Gas Pipeline Project, Coos Bay Estuary,” prepared by Ellis Ecological Services, Inc., for PCGP
- April 2014 “Jordan Cove Energy Project – Compensatory Wetland Mitigation Plan” prepared by David Evans and Associates
- 24 October 2014 “Addendum 2 – Channel Resample Sediment Characterization Report, Kentuck Slough Wetlands Mitigation Site, Jordan Cove LNG Project, Coos Bay, Oregon,” prepared by GRI
- 13 November 2014 “Small Pond Embankment Modification Sediment Characterization Report, Kentuck Slough Wetlands Mitigation Site,” prepared by GRI

National Environmental Policy Act Documents

- 14 November 2014 Public Notice No. NWP-2012-441, for the JCLNG-PCGP Project issued by Portland District Regulatory Branch
- November 2014 *Jordan Cove Energy and Pacific Connector Gas Pipeline Draft Environmental Impact Statement* (DEIS) prepared by the Federal Energy Regulatory Commission
- September 2015 *Jordan Cove Energy and Pacific Connector Gas Pipeline Final Environmental Impact Statement* (FEIS) prepared by the Federal Energy Regulatory Commission

ATTACHMENT A

TABLE OF LEVEL 1 SITE HISTORY INFORMATION AND
STREAM CROSSING INFORMATION FOR THE
JORDAN COVE LNG
AND
PACIFIC CONNECTOR GAS PIPELINE

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
ECSI Site 1083 (Mill Site)	Upland	JCLNG	ECSI Site 1083 - The former mill complex consisted of a main mill/paper machine building, shipping warehouse and maintenance/operations buildings, several other buildings used for office space, shops, storage, and other purposes, and related improvements and infrastructure. The developed portions of the facility occupied the north central portion of the property, and the southern portions are undeveloped and consist of vegetated open spaces, stream channels, and shoreline/tidal flat areas along Coos Bay. Most site structures have been removed to ground level as part of mill decommissioning. Surface features such as concrete slabs have been left in place. Prior to construction of the mill, the area in the immediate vicinity of the mill was covered with low brush and grass. The vegetation was stripped and the area covered with several feet of dune sand to raise the elevation above high tide and flood levels. South of the building, toward Jordan Cove, large amounts of driftwood and vegetation were left in place and covered with fill sand to create a log storage yard. The mill site was originally developed as a sulfite process pulp and paper mill by the Menasha Wooden Ware Corporation (Menasha) in 1961, and Weyerhaeuser acquired the mill from Menasha in 1981. In 1995, Weyerhaeuser ceased pulp mill operations, and the facility was operated as a 100 percent recycle paper mill until it was closed in 2003. Since 2003, Weyerhaeuser has been decommissioning the facility and preparing the property for future alternative uses and possible sale. Weyerhaeuser leased the property east of the main mill area between the railroad tracks and Coos Bay to a fish hatchery operation that existed from approximately 1980 to 1992. Structures and improvements associated with the former hatchery operation included the fish hatchery structure, four buildings, and an above-ground storage tank (AST) for diesel storage. The fish hatchery improvements have been removed, and the property is currently vacant and undeveloped. Additional details concerning the site including the physical setting, hydrogeology, and operational history can be found in the document entitled Level II Environmental Site Assessment, Former Weyerhaeuser Containerboard Mill (PES, 2006). Additional details concerning the Ingram Yard parcel referred to in the Level II report are located under ECSI #4704. On 8/23/90 an expansion joint on a fuel line north of the Recovery Plant ruptured, resulting in oil spillage within the sand containment area surrounding the fuel tanks. The line failure was due to new fuel pumps, which exerted a higher pressure on the line than the expansion joint was equipped to handle. During the cleanup, it was found that the sump surrounding the pumps had been leaking oil for an extended period of time. The opening of the sump has been sealed (until permanent repairs are finished). With DEQ advice, several points around the sump were excavated to determine the direction and depth of the plume. The penetration appeared to extend to a depth of about four feet and flowed in an easterly direction. Contaminants detected during investigative work over the years have included: mineral spirits, hydraulic oil, diesel, heavy-oil-range petroleum hydrocarbons (total petroleum hydrocarbons, or "TPH"), heavy metals, butylated tin compounds, polynuclear aromatic hydrocarbons, polychlorinated biphenyls, and dioxins. Existing site grades will be raised a minimum of 3 ft with clean structural fill consisting of sand from the new slip to be excavated on the Ingram Yard property. Development over the existing mill wastewater system settling basins will require over-excavation of geotechnically unsuitable (highly organic) sludge in the basins and replacement with clean, compacted structural fill. Areas where structures will be seismically designed to minimize settlements will require ground improvement to a depth of about 35 ft below existing site grades to increase the density of the loose to medium dense sand fill. Methods of ground improvement have not been selected, but could include dynamic compaction or vibro compaction. Material from the onsite settling basins will be dewatered and transported to an open area in the Cell 3 landfill for temporary disposal. the Cell 3 landfill will be covered with a minimum 18 in. of clean sand as an interim measure pending final closure of the landfill. The surface of the solids cake area will be sloped to drain away from the center of the landfill. Spoil from the ground improvement activities in the lowerator and mineral release area will be managed as petroleum-contaminated soil and transported off-site to an approved DEQ-regulated facility. For asbestos containing material (ACM), a minimum of 3 ft of clean sand will be placed over the area with ACM. Any ground improvement completed in the ACM area will likely be completed with dynamic compaction with wet working area; Any ACM excavated will be double bagged in accordance with DEQ asbestos regulations and temporarily disposed of as allowed by permit in landfill Cell 3, or transported to an approved off-site facility. ACM placed in Cell 3 will be covered with a minimum 18 in. of clean sand as an interim measure pending final closure of the landfill.											
ECSI Site 4704 (Ingram Yard)	Upland	JCLNG	Weyerhaeuser evaluated environmental conditions at the Ingram Yard property as part of their Containerboard (ECSI #1083) facility closure and decommissioning process. (The investigation for this site was completed as a part of the former Weyerhaeuser North Bend Containerboard Mill closure work, and the various reports for the Ingram Yard are kept in the file for ECSI #1083). Areas of concern were identified by reviewing data from past environmental assessment work, observations of current site conditions, DEQ's strategy recommendation (including a list of areas DEQ recommended for evaluation), Weyerhaeuser's knowledge of past practices, and the findings of a recent Level I Environmental Site Assessment (ESA) report. A preliminary scope of work for a Level II investigation to evaluate the Ingram Yard was provided to and approved by DEQ during April and June 2005. As a part of their Level II investigation, Weyerhaeuser conducted a screening level human and ecological risk assessment of residual contamination present in surface soils at the Ingram Yard. The report concluded that residual contaminants do not exceed DEQ's acceptable risk levels. DEQ considers the investigation the Ingram Yard to be complete and recommends that, unless new or previously undisclosed information becomes available which warrants further investigation, no further action is required at the Ingram Yard under ORS 465.200, et. seq. **However, while surface soils at the Ingram Yard site meet human health and ecological screening criteria, they contain low levels of potentially bioaccumulating chemicals and must not be placed in waters of the state.** The log yard sort debris will be managed as permitted non-hazardous solid waste. The debris will be excavated and removed by truck to the Mill Site landfill Cell 3 for temporary disposal. Sludge at the Ingram Yard will be managed as permitted non-hazardous solid waste. The sludge in the area of the slip and below the footprint of planned industrial facility on and adjacent to Ingram Yard will be excavated and placed in a new soil berm to be constructed adjacent to the rail line along the northernmost portion of Ingram Yard. The sludge in the soil berm will be capped with a minimum of 2 ft of clean sand from the slip excavation. Any excess sludge will be relocated by truck back to the Mill Site landfill Cell 3 for temporary disposal and capped with a minimum 18 in. of clean sand as an interim measure pending final closure of the landfill.											
Coos Bay	Estuary	2.92R	12845.19	29496.36	Wet Open-Cut	Wet open cut only feasible practical in bay crossing method	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, migration, rearing habitat T, CH	Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	4 Coastal Pelagic spp., 21 Groundfish spp, 2 Salmonid spp. Pelagic, Groundfish, and Salmonids (see Table 3B-6)	Oct 1 to Feb 15	--	--	--
Trib. to Coos Bay (GSI026)	Intermittent Minor	4.89R	5.74	11.91	Dry Open-Cut	Dry open-cut method feasible/practical on small intermittent headwater tributary if flowing at time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib to Kentuck Slough (EE004/GW27)	Intermittent Intermediate	6.23R	12.93	26.82	Dry Open-Cut	Dry open-cut method feasible/practical on small intermittent ditched tributary if flowing at time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
Kentuck Slough (EE005/GSP-28)	Perennial Intermediate	6.28R	61.74	128.05	Conventional Bore	Dry open-cut methods likely feasible using coffer dams/diversions based on flow, channel size (depth and width). Conventional bore feasible based on width and depth; however extensive dewatering requirements expected because of anticipated groundwater conditions. Local traffic encumbrances would be avoided with boring methods. An HDD is like probable, based on topography, and expect geotechnical conditions, but likely not along the same alignment because of geometry requirements associated with large diameter pipe. Significant HDD costs, HDD time requirements were the determinants for the proposed conventional bore.	Oregon Coast ESU Coho, migration, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trib to Coos Bay (NW-117/EE06)	Perennial Major	6.35R	544.60	847.15	Dry Open-Cut	Dry open-cut method feasible/practical on small channelized tributary within golf course lacking effect riparian vegetation.	Oregon Coast ESU Coho, assumed habitat T	Coho Assumed, Winter Steelhead	Coho Assumed	Jul 1 to Sep 15	--	--	--
Willanch Creek (Denied Access 01)	Intermittent Minor	7.99R	3.00	6.22	Dry Open-Cut	Dry open-cut method feasible/practical on small headwater tributary, if flowing at the time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
Willanch Slough (EE007)	Perennial Intermediate	8.34R	14.07	29.18	Dry Open-Cut	Dry open-cut method feasible/practical on small tributary within pasture/hayfield lacking effect riparian vegetation.	Oregon Coast ESU Coho, migration, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trib to Willanch Slough (GDX029/EE008)	Perennial N/A	8.43R	-	-	Not Crossed by Centerline	Not crossed by centerline (likely intermittent – headwater trib.)	Oregon Coast ESU Coho, migration, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trip to Willanch Slough (GDX030)	Intermittent Intermediate	8.48R	12.84	26.63	Dry Open-Cut	Dry open-cut method feasible/practical on small intermittent channelized tributary on edge of pasture.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Willanch Slough (GDX031)	Intermittent Intermediate	8.49R	49.89	103.48	Dry Open-Cut	Dry open-cut method feasible/practical on small intermittent tributary if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Tributary to Coos River (GW34)	Intermittent N/A	9.55R	-	-	Adjacent to centerline within ROW	Not crossed by centerline (likely intermittent – headwater trib.)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Cooston Channel (Echo Creek) (SS-100-002)	Intermittent Intermediate	10.22R	79.88	165.68	Dry Open-Cut	Dry open-cut method feasible/practical on small headwater tributary, if flowing at the time of construction.	Oregon Coast ESU Coho, spawning habitat T, CH	Winter Steelhead Coho	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Coos River (SS-001-003)	Intermittent N/A	10.79R	-	-	Adjacent to centerline within ROW	Not crossed by centerline (intermittent – headwater trib.)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Coos River (BSP119)	Perennial Major	11.13R	-	-	HDD [10] Level 1 [11]	HDD feasible based on geometry, topography, and geotechnical conditions along proposed alignment. Primary HDD activities are significantly set back from crossing. Conventional bore not feasible/practical because of crossing length and high groundwater areas on either side of river. Dry open-cut or diverted open-cut methods not practical/feasible based on flow volumes and tidal influence.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, migration, rearing habitat T, CH	Fall Chinook, Coho, Winter Steelhead, Green Sturgeon, Pacific Lamprey	Chinook, Coho Pelagic, Groundfish, (see Table 3B-5)	Oct 1 to Feb 15 [10]	--	--	--
Vogel Creek (SS-100-005)	Perennial Intermediate	11.53R	34.52	71.60	Dry Open-Cut	Dry open-cut method feasible/practical on 45-foot wide waterbody during low flow period within fish window. Low gradient waterbody will minimize flow volumes that require management during crossing. Impacts to riparian vegetation minimized by placement/setbacks of TEWAs on edges of waterbody in field. Conventional bore crossing method avoided because of high groundwater present on either side of waterbody.	Oregon Coast ESU Coho, spawning habitat T, CH	, Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Vogel Creek (SS-100-005	Perennial N/A	11.58R	-	-	Adjacent to centerline within ROW	Not crossed by centerline. HDD pull back crossing will occur on rollers across small 10-foot wide ditched waterbody	Oregon Coast ESU Coho, spawning habitat T, CH	, Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Coos River ((SS-100-006)	Perennial Minor	11.77R	8.78	18.21	Dry Open-Cut	Dry open-cut method feasible/practical on small ditched tributary in pasture, if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Lillian Creek (SS-100-007)	Perennial Minor	11.91R	8.38	17.38	Dry Open-Cut	Dry open-cut method feasible/practical on small ditched tributary, if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Lillian Creek (SS-100-002a)	Perennial Intermediate	12.07R	86.00	178.37	Dry Open-Cut	Dry open-cut method feasible/practical on 80-foot wide trapezoidal channeled waterbody during low flow period within fish window. Low gradient waterbody will minimize flow volumes that require management during crossing. Impacts to riparian vegetation minimized by placement/setbacks of TEWAs on edges of waterbody in field. Conventional bore crossing method avoided because of high groundwater present on either side of waterbody.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, migration, rearing habitat T, CH	Coho, Winter Steelhead, Green Sturgeon	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Coos River (SS-100-008)	Intermittent Intermediate	12.22R	18.16	37.67	Dry Open-Cut	Dry open-cut methods feasible/practical on small ditched tributary in pasture.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Coos River (BDX109)	Intermittent Minor	8.67	5.72	11.86	Dry Open-Cut	Dry open-cut methods feasible/practical on small ditched tributary	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Coos River (BDX109a)	Intermittent Minor	8.73	4.45	9.23	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater tributary. No additional workspace required within forested wetland.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP104)	Perennial Minor	9.02	2.33	4.83	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide headwater tributary. No additional workspace required.	Oregon Coast ESU Coho, assumed habitat T,	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP105)	Perennial Minor	9.19	2.83	5.87	Dry Open-Cut	Dry open cut methods feasible/practical on small 2-3' wide waterbody.	Oregon Coast ESU Coho, assumed habitat T,	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (DSI003)	Intermittent Intermediate	9.33	11.72	24.31	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction. No additional workspace required.	None	None	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (DSP002)	Perennial Minor	9.51	4.20	8.71	Dry Open-Cut (Streambed – bedrock) [12]	Dry open-cut methods feasible/practical on small 3-5' wide headwater tributary. No additional workspace required.	None	None	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Monkey Gulch (Denied Access 05X)	Perennial Minor	10.20	9.68	10.38	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5-6' wide trapezoidal channel. Immediately adjacent to county road. High groundwater area is problematic for conventional bore crossing because of water management.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, spawning habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Stock Slough (BSP088)	Perennial Intermediate	10.32	15.67	32.50	Dry Open-Cut Level 1 [11]	Dry open-cut methods feasible/practical on channelized slough crossings. PI, residential area and topographic conditions limit workspace on north for bore. Dewatering issues likely due to high groundwater issues on south side in floodplain agricultural wetland. Multiple crossings of slough required because of residential routing constraints.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Pasture Pond (BL084)	Stock pond N/A	10.40	-	-	Adjacent to centerline within ROW	Man-made pond expected to be dry at the time of construction and will be avoided if possible. Pond will be reconstructed if disturbed.	None	None	None	Jul 1 to Sep 15	--	--	--
Catching Slough (BSP079)	Perennial Major	11.11	256.83	532.68	Conventional Bore Level 1 [11]	Dry open-cut methods not feasible based on flow, channel size (depth and width). Conventional bore feasible based on width, depth and expected groundwater dewater requirements. An HDD is probable at the approximate crossing location based on the topography, geometry and expected geotechnical conditions. Significant HDD costs, HDD time requirements were the determinants for the proposed conventional bore.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, migration, rearing habitat T, CH	Fall Chinook, Coho, Winter Steelhead	Chinook, Coho	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BDX118)	Intermittent Minor	11.29	9.24	19.16	Dry Open-Cut	Dry open-cut methods feasible/practical on small ditched tributary in pasture.	Oregon Coast ESU Coho, assumed habitat T	Coho, Winter Steelhead,	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP114)	Perennial Minor	11.47	2.02	4.19	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-3' wide headwater tributary. No additional workspace required.	None	None	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP103)	Perennial Minor	11.78	3.07	6.37	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-4' wide waterbody. ROW necked-down & no additional workspace required for crossing.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Trib. to Catching Slough (BSP101)	Perennial Minor	11.84	1.22	2.53	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide waterbody. ROW necked-down & no additional workspace required for crossing.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (BSP100)	Perennial Minor	11.87	4.76	9.87	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide waterbody ROW necked-down & no additional workspace required for crossing.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Catching Slough (NSI041)	Intermittent Minor	12.05	1.64	3.4	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI092)	Intermittent Minor	12.27	4.99	10.35	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI093)	Intermittent Minor	12.31	4.00	8.30	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI094)	Intermittent Minor	12.39	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small headwater waterbody expected to be dry during construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI095)	Intermittent Minor	12.39	6.76	14.02	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI096)	Intermittent Minor	12.41	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small headwater waterbody expected to be dry during construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI097)	Intermittent Minor	12.45	5.54	11.49	Dry Open-Cut	Small intermittent headwater tributary - dry open cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib to Catching Slough (NSI098)	Intermittent Minor	12.52	6.14	12.73	Dry Open-Cut	Small intermittent headwater tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (BSP120)	Perennial Minor	12.66	-	-	Adjacent to centerline within ROW	Not crossed by centerline (likely intermittent – headwater trib.)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (BSP121)	Perennial Minor	12.68	-	-	Adjacent to centerline within ROW	Not crossed by centerline (likely intermittent headwater trib.)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (BSP122)	Perennial Minor	12.83	1.23	2.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater tributary. No additional workspace required. (likely intermittent)	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Trib. to Ross Slough (BSP125)	Perennial Minor	12.90	5.82	12.07	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater tributary. No additional workspace required. (likely intermittent)	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP031)	Perennial Minor	12.97	4.21	8.73	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP030)	Perennial Minor	13.01	3.01	6.24	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP029)	Perennial Minor	13.11	4.19	8.69	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4’ wide headwater tributary. No additional workspace required.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Ross Slough (CSP028)	Perennial Minor	13.55	3.83	7.94	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP027)	Perennial Minor	13.61	2.18	4.52	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-3’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Ross Slough (CSP026)	Perennial Minor	13.70	4.31	8.94	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Boone Creek (EDX078)	Perennial Minor	15.71	4.64	9.62	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on small 5’ wide waterbody. Road and topography on north side prevent conventional bore feasibility due to excessive grading/excavation requirements for bore pit on north side.	Southern DPS Green Sturgeon, T, CH Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Boone Creek (CSI037)	Intermittent Minor	16.36	1.14	2.36	Dry Open-Cut	Small 1’wide intermittent tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	none	None	Jul 1 to Sep 15	--	--	--
Trib. to Boone Creek (CSP036)	Perennial Minor	16.36	4.23	8.77	Dry Open-Cut	Dry open cut methods feasible/practical on small 4’ wide headwater tributary. No additional workspace required for crossing.	None	none	None	Jul 1 to Sep 15	--	--	--
Trib. to Boone Creek (CSI035)	Intermittent Minor	16.39	1.02	2.12	Dry Open-Cut	Small 1’wide intermittent tributary - dry open-cut methods feasible/practical if flowing at time of construction.	None	none	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP024)	Perennial Minor	16.56	1.53	3.17	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1.5’ wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP023)	Perennial Minor	16.62	3.08	6.39	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3’ wide headwater tributary.	None	Assumed	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Trib. To Catching Creek (CSP022)	Perennial Minor	16.71	2.34	4.85	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP021)	Perennial Minor	16.73	5.01	10.93	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP020)	Perennial Minor	16.78	5.81	12.05	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP019)	Perennial Minor	16.82	3.00	6.22	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (CSP018)	Perennial Minor	16.85	8.46	17.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5' wide headwater tributary. No additional workspace required	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Catching Creek (BLM 17.42)	Intermittent Minor	17.42	4.05	8.40	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide headwater tributary.	None	None	None	Jul 1 to Sep 15	--	--	--
Catching Creek (CSP033)	Perennial Minor	17.47	4.25	8.81	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-4' wide headwater stream. Steep topographic constraints prevent a conventional bore crossing because of bore pit grading/excavation requirements on both sides of stream.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Coast Range Ecoregion, Coquille Sub-basin (HUC 17100305), Coquille River (HUC 1710030505) Fifth field Watershed[8], Coos County, Oregon													
Trib. To Cunningham Creek (BSP092)	Perennial Minor	18.20	2.32	4.81	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide tributary. Steep topographic constraints also prevent a conventional bore crossing because of bore pit grading/excavation requirements on north side of stream.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Cunningham Creek (BSP093)	Perennial Minor	18.28	1.34	2.78	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Cunningham Creek (BSP095)	Perennial Minor	18.33	1.38	2.86	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide headwater tributary.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Cunningham Creek (BSI096)	Intermittent Minor	18.48	1.08	2.24	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide headwater tributary if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Cunningham Creek (NSP042)	Perennial Intermediate	18.93	37.68	78.15	Dry Open-Cut (Streambed-bedrock)[6] Level 1	Dry open-cut methods feasible/practical on small stream. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topographic constraints on either side of stream prevent a conventional bore crossing because of bore pit grading/excavation requirements.	Oregon Coast ESU Coho, assumed habitat T	Coho assumed, Winter Steelhead,	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To Cunningham Creek (NSP043)	Perennial Intermediate	19.06	24.58	50.98	Dry Open-Cut (Streambed-bedrock)[6]	Dry open-cut methods feasible/practical on small stream. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topographic constraints on either side of stream prevent a conventional bore crossing because of bore pit grading/excavation requirements.	Oregon Coast ESU Coho, assumed habitat T	Coho Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Coast Range Ecoregion, Coquille Sub-basin (HUC 17100305), North Fork Coquille River (HUC 1710030504) Fifth field Watershed [8] Coos County, Oregon													
Trib. to Steele Creek (ESI028)	Intermittent Minor	20.34	6.57	13.63	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 2-3’ wide intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (ESI028)	Intermittent Minor	20.59	3.14	6.51	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 2-3’ wide intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (Denied Access 06)	Intermittent Minor	20.72	3.01	6.24	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-3’ wide intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (Denied Access 07)	Intermittent Minor	20.79	1.51	3.13	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-3’ wide intermittent tributary, if flowing at time of construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (Denied Access 08)	Intermittent Minor	20.94	1.64	3.40	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-3’ wide intermittent tributary, if flowing at time of construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Steele Creek (NSP015)	Perennial Intermediate	21.10	12.10	25.1	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide tributary.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	, Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (Denied Access 09)	Intermittent Minor	21.13	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-3' wide intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Steele Creek (ESI029)	Intermittent Minor	21.36	-	-	Adjacent to centerline within ROW	Small 3' wide intermittent tributary adjacent to ROW not crossed.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
North Fork Coquille River (BSP207)	Perennial Intermediate	23.06	20.66	42.85	Dry Open-Cut Level 1[13]	Dry open-cut method feasible/practical on 20' wide river during low flow period within fish window. Impacts to riparian vegetation minimized by placement/setbacks of TEWAs on west side of river in field and eastside setback 100 feet from waterbody. ROW also necked down to 75 feet. Topographic conditions on east side of the crossing prevent HDD crossing methods because of elevation differences between entry/exit and necessary workspace grading requirements.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Sep 15	--	--	--
Trib. to Middle Creek (BSI137)	Intermittent Intermediate	27.01	12.70	26.34	Dry Open-Cut	Intermittent tributary to be crossed at the same time as the crossing of Middle Creek at MP 27.04 using dry open-cut. Tributary expected to be dry at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Middle Creek (BSI136)	Intermittent Minor	27.02	-	-	Adjacent to centerline within ROW	Intermittent tributary not crossed by centerline.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Middle Creek (BSI135)	Intermittent Minor	27.04	-	-	Adjacent to centerline within ROW	Intermittent tributary not crossed by centerline.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Middle Creek (BSP133)	Perennial Intermediate	27.04	64.99	134.79	Dry Open-Cut Level 2	Dry open-cut methods feasible/practical on creek during low flow period within fish window. A conventional bore crossing is not feasible because of topographic constraints on west side of creek because of grading/excavation requirements for bore pit. An HDD is not feasible because of topographic/geometry conditions.	Oregon Coast ESU Coho, rearing, migration habitat T, CH	Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Coast Range Ecoregion, Coquille Sub-basin (HUC 17100305), East Fork Coquille River (HUC 1710030503) Fifth field Watershed [8], Coos County, Oregon													
Trib. To E. Fork Coquille (BSP077)	Perennial Intermediate	28.86	12.48	25.88	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical on small incised headwater trib. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topographic conditions prevent a conventional bore because of bore pit grading/excavation requirements on both sides of the crossing.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To E. Fork Coquille (NSI099)	Intermittent Minor	29.18	6.23	12.92	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide incised trib. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topographic conditions prevent a conventional bore because of bore pit grading/excavation requirements on both sides of the crossing.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To E. Fork Coquille (BSI073)	Intermittent Intermediate	29.49	10.26	21.28	Dry Open-Cut	Dry open-cut methods feasible/practical on small tributary. Steep topographic conditions prevent a conventional bore because of bore pit grading/excavation requirements on west side of the crossing.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To E. Fork Coquille (BSI076)	Intermittent Minor	29.53	5.48	11.37	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 3-4' intermittent tributary if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

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Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
East Fork Coquille River (BSP071)	Perennial Intermediate	29.88	61.91	128.41	Dry Open-Cut Level 1[13]	Project alignment was selected based on landowner negotiations and requirement to avoid landowner's air strip. Dry open-cut methods feasible/practical during low flow crossing period during ODFW in-water work window. Conventional bore is not practical because of significant grading/excavation requirements for bore pits. The river is deeply incised below stream banks requiring extensive pits for installation below streambed. Continued bore pit dewatering would be required to keep bore pits dry. A temporary bridge is also necessary to prevent entire spread move around. A crossing bridge will require bank grading for crossing access. An HDD is probable at the approximate crossing location based on the topography, geometry and expected geotechnical conditions. Significant HDD costs, HDD time requirements and the need for a crossing bridge were the determinants for the proposed dry-open cut crossing method.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Sep 15	--	--	--
Trib. to E. Fork Coquille (Denied Access 11)	Intermittent Minor	30.21	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at the time of construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to E. Fork Coquille (Denied Access 12)	Intermittent Minor	30.27	1.51	3.13	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To E. Fork Coquille (BSI070)	Intermittent Minor	31.64	1.16	2.41	Dry Open-Cut	Small 1-wide intermittent headwater tributary, dry open-cut methods feasible/practical, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Elk Creek (BSP057)	Perennial Minor	32.40	7.67	15.91	Dry Open-Cut Level 1[13]	Dry open-cut methods feasible/practical on small 8' wide tributary. Steep topographic conditions on north side of stream prevent a conventional bore because of grading/excavation requirements for bore pit. StreamNet data indicates anadromy below crossing (~ 1 mile).	Oregon Coast ESU Coho, assumed habitat T	Coho, Winter Steelhead,	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To Elk Creek (BSP055)	Perennial Minor	32.44	3.50	7.26	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 3-4' wide tributary.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. To Elk Creek (BSP049)	Perennial Minor	32.99	9.79	20.31	Dry Open-Cut	Dry open-cut methods feasible/practical on small 10' wide tributary. Topographic conditions on both sides of stream limit a conventional bore because of grading/excavation requirements for bore pits.	None	Assumed	None	Jul 1 to Sep 15	--	--	--
Trib. To Elk Creek (BSP050)	Perennial Minor	33.02	-	-	Adjacent to centerline within ROW (Streambed – bedrock)[6]	Not crossed by pipeline centerline. Small 2' wide headwater tributary expected to be dry during construction. Trib. would be crossed at the same time as BSP049 at MP 32.99.	None	Assumed	None	Jul 1 to Sep 15	--	--	--
South Fork Elk Creek (CSP005)	Perennial Intermediate	34.46	49.40	102.46	Dry Open-Cut (Streambed – bedrock)[6] Level 2	Dry open-cut methods feasible/practical on stream. Steep topographic conditions on both sides of stream prevent conventional bore crossing methods because of grading/excavation requirements for bore pits.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. To S. Fork Elk Creek (BSI251)	Intermittent Minor	35.51	4.12	8.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater tributary, if flowing at time of construction. Crossing will occur adjacent to road where existing culvert is in place.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Coast Range Ecoregion, Coquille Sub-basin (HUC 17100305), Middle Fork Coquille River (HUC 1710030501) Fifth field Watershed [8], Coos County, Oregon													
Trib. to Big Creek (BLM 35.87)	Intermittent Minor	35.87	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater tributary, if flowing at time of construction. Crossing occurs within Elk Creek Road (BLM 28-11-29-0) and flows through a 12" culvert which will be replaced.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Big Creek (BLM 36.48)	Intermittent Minor	36.48	2.26	4.69	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Trib. To Big Creek (GSI025/BSI253)	Intermittent Minor	36.54	6.00	12.44	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater tributary, if flowing at time of construction. No additional workspace required. ODFW fish passage barrier data reports a downstream boulder canyon with a 10-foot falls at upper end (RecordID 52488). StreamNet data indicates anadromy below crossing (~ 0.5 mile) at ODFW barrier 52488.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Big Creek (BLM 36.85)	Intermittent Minor	36.85	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater tributary, if flowing at time of construction. Crossing occurs within Elk Creek Road (BLM 28-11-29-0) and flows through a 12-18" culvert which will be replaced.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Big Creek (BSI252)	Intermittent Minor	36.92	3.00	6.22	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater tributary, if flowing at time of construction. No additional workspace required. Alignment and trib. crossing along existing road. ODFW fish passage barrier data reports a downstream boulder canyon with a 10 foot falls at upper end (RecordID 52488). StreamNet data indicates anadromy below crossing (~ 1 mile) at ODFW barrier 52488.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. To Big Creek (ESI019)	Intermittent Minor	37.33	2.75	5.70	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater tributary, if flowing at time of construction. No additional workspace required. ODFW fish passage barrier data reports a downstream boulder canyon with a 10 foot falls at upper end (RecordID 52488). StreamNet data indicates anadromy below crossing (~ 1 mile) at ODFW barrier 52488. StreamNet data indicates anadromy below crossing (~ 1 mile) at ODFW barrier 52488.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. To Big Creek (ESP020)	Perennial Intermediate	37.35	14.93	30.97	Dry Open-Cut Level 1[13]	Dry open-cut methods feasible/practical on stream. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topography on both sides of stream prevents conventional bore crossing methods because of grading/excavation requirements for bore pits. No additional workspace proposed. ODFW fish passage barrier data reports a downstream boulder canyon with a 10 foot falls at upper end (RecordID 52488). StreamNet data indicates anadromy below crossing (~ 1 mile) at ODFW barrier 52488.	Oregon Coast ESU Coho, Spawning, rearing habitat T	Coho	Coho	Jul 1 to Sep 15	--	--	--
Upper Rock Creek (BSP041)	Perennial Intermediate	44.21	16.04	33.27	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on stream. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. Steep topography on both sides of stream prevents conventional bore crossing methods because of grading/excavation requirements for bore pits. ODFW fish passage barrier data indicated two potential downstream falls may limit passage one report as 6-8 feet (RecordID 52484). StreamNet data indicates anadromy below crossing (~ 6 miles) at ODFW barrier RecordID 52484.	None	None	None	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, Coquille Sub-basin (HUC 17100305), Middle Fork Coquille River (HUC 1710030501) Fifth field Watershed [8], Douglas County, Oregon													
Deep Creek (BSP257)	Perennial Intermediate	48.27	80.89	167.77	Dry Open-Cut	Dry open-cut methods feasible/practical on broad stream and associated wetlands. ODFW fish passage barrier data (Recordid 56033) reports downstream falls on the Middle Fork Coquille River restrict anadromy at crossing.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Middle Fork Coquille River (BSP030)	Perennial Intermediate	50.28	45.14	93.62	Dry Open-Cut (Streambed – bedrock)6 Level 1[13]	Dry open-cut methods feasible/practical on broad stream during low flows within ODFW in-water work windows. ROW has been necked down to 75 feet and TEWAs located in existing cleared areas to minimize riparian impacts. ODFW fish passage barrier data (Recordid 56033) reports downstream falls on the Middle Fork Coquille River restrict anadromy at crossing. StreamNet data also indicates duplicates this anadromy restriction at this barrier.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Middle Fork Coquille (GDX36/BSI066)	Intermittent Minor	50.45	2.63	5.45	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-4’ wide intermittent ditched tributary in ag field if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Belieu Creek (BSP061/GSI037)	Perennial Minor	50.74	5.60	11.61	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3’ wide headwater tributary. Steep topography on west side of crossing prevents conventional bore because of grading/excavation requirements for a bore pit. ODFW fish passage barrier data (RecordID 56033) reports downstream falls on the Middle Fork Coquille River restrict anadromy at the crossing.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Middle Fork Coquille (GSI038)	Intermittent Intermediate	51.02	4.39	9.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-4’ wide intermittent headwater tributary if flowing at time of construction. No additional workspace required.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Olalla Creek-Lookingglass Creek (HUC 1710030212) Fifth field Watershed [8], Douglas County, Oregon													
Trib. to Shields Creek (BSI202)	Intermittent Intermediate	55.90	55.38	114.86	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Shields Creek (BSI203)	Intermittent Minor	55.94	8.03	16.65	Dry Open-Cut	Dry open-cut methods feasible/practical on small 8’ wide intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Shields Creek (Denied Access 13)	Intermittent Minor	56.28	1.50	3.11	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3-4’ wide intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Shields Creek (Denied Access 14)	Intermittent Minor	56.34	1.55	3.21	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3-4’ wide intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Trib. to Olalla Creek (BSI140)	Intermittent Minor	57.11	4.52	9.37	Dry Open-Cut (Streambed – bedrock)	Dry open-cut methods feasible/practical on small intermittent tributaries if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI140)	Intermittent Minor	57.14	2.01	4.17	Dry Open-Cut (Streambed – bedrock)	Dry open-cut methods feasible/practical on small intermittent tributaries if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI138)	Intermittent Minor	57.31	5.03	10.43	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5' wide intermittent tributary if flowing at time of construction. ROW has been necked down to 75 feet and TEWAs located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI147/EE012)	Intermittent Minor	57.84	4.26	8.84	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent tributary if flowing at time of construction. ROW has been necked down to 75 feet and TEWAs located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI151)	Intermittent Minor	58.20	3.06	6.35	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent tributary if flowing at time of construction. ROW has been necked own to 75 feet and TEWAs located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSP159)	Perennial Intermediate	58.55	10.60	21.99	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 10' wide tributary. ROW has been necked down to 75 feet and TEWA located in existing cleared area to minimize riparian impacts.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Olalla Creek (BSP155)	Perennial Intermediate	58.77	77.90	161.57	Dry Open-Cut Level 2	Dry open-cut methods feasible/practical on broad stream during low flows within ODFW in-water work windows. (USGS Gage station 1431120 reports Mean of monthly discharge recording period 1956 to 1973 of 2.0, 0.52 & 0.77 cfs, respectively for Jul, Aug & Sep). TEWAs have been located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Coho, Winter Steelhead	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Olalla Creek (BSI132)	Intermittent Minor	59.29	8.65	17.94	Dry Open-Cut	Dry open-cut methods feasible/practical on small 9' wide intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Olalla Creek (BSI129)	Intermittent Intermediate	59.65	18.72	38.83	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to McNabb Creek (NSP014)	Perennial Minor	60.13	6.01	12.47	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 6' wide tributary. Extensive grading/excavation requirements limit feasibility of conventional bore methods.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
McNabb Creek (NSP013)	Perennial Intermediate	60.49	10.96	22.73	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical on tributary. TEWAs located in existing cleared areas to minimize riparian impacts.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Clark Branch-South Umpqua River (HUC 1710030211) Fifth field Watershed [8], Douglas County, Oregon													
Kent Creek (BSP240)	Perennial Intermediate	63.95	61.66	127.89	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on broad stream during low flows within ODFW in-water work windows. Steep topographic conditions on both sides of the stream prevent conventional bore methods because of extensive grading/excavation requirements for bore pits	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Kent Creek (BSI241)	Intermittent Minor	63.95	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent tributary expected to be dry during construction and will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Rice Creek (BSP227)	Perennial Major	65.76	132.94	275.73	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical during low flows periods within ODFW in-water work windows. Alignment is defined by residential development in immediate area. ROW has been necked down to 75 feet and TEWAs located in cleared areas to minimize riparian disturbances.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Willis Creek (BSI230)	Intermittent Minor	66.87	-	-	Adjacent to centerline within ROW (Streambed – bedrock)	Not crossed by centerline, 2' wide intermittent tributary expected to be dry during summer construction period. Tributary will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
ECSI Site 583	Upland	Near MP 67.0, off Pipeline ROW Hult Chip Yard and the 2.65-acre Hult Chip Yard Parking Area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The Roseburg Forest Products site located in Douglas County is adjacent to two proposed construction yards for the PCGP Project (i.e., the 8.9-acre Hult Chip Yard and the 2.65-acre Hult Chip Yard Parking Area). According to ODEQ records, Roseburg Forest Products has been landfilling hazardous substances in its own solid waste landfill. In 1985 it was also reported that a diesel tank ruptured resulting in the release of 8,000 gallons of fuel at the site with subsequent cleanup. As of 1996, the ODEQ required no further action in the cleanup program at this facility but indicated that further work will be conducted to assess potential hazardous substance releases from the landfill of solid waste. In 2006, solvents could still be detected in the down gradient wells. Roseburg Forest Products is working with the ODEQ Solid Waste Program to create a lined ash monofill to better manage the waste they currently generate. Although this site is located within 0.07 mile of Pacific Connector's proposed 8.9-acre Hult Chip Yard, the yard would only be used as a rail port to offload pipe transported to the project area. No excavation will be required to utilize this yard; therefore contact with contaminated sediments or groundwater will not occur.		
Willis Creek (BSP168)	Perennial Intermediate	66.95	46.79	97.05	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical during low flows periods within ODFW in-water work windows. ROW has been necked down to 75 feet and TEWAs located in cleared areas to minimize riparian disturbances.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Willis Creek (BSI169)	Intermittent Intermediate	67.00	22.31	46.27	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small intermittent tributary, if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-011)	Intermittent N/A	69.10	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent headwater tributary expected to be dry during construction and will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-012)	Perennial Intermediate	69.28	23.45	48.64	Dry Open-Cut	Dry open-cut methods feasible/practical during low flows periods within ODFW in-water work windows. No TEWAs are proposed to minimize riparian and landowner impacts.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Trib. to South Umpqua River (SS-100-013)	Perennial Intermediate	69.35	20.10	41.69	Dry Open-Cut	Dry open-cut methods feasible/practical during low flows periods within ODFW in-water work windows. No TEWAs are proposed to minimize landowner impacts.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-014)	Intermittent Minor	69.57	3.46	7.18	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-015)	Intermittent Intermediate	71.11	62.05	128.72	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary which is expected to be dry at the time of construction. Crossing would be completed during low flows periods within ODFW in-water work windows. Tributary is within required laydown area for the Direct Pipe crossing of the South Umpqua River.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
South Umpqua River (BSP026)	Perennial Major	71.30	-	-	Direct Pipe Level 2[13]	The Direct Pipe crossing method has been evaluated and determined to be feasible at the proposed crossing location. The proposed alignment has been rerouted to facilitate the crossings of I-5, South Umpqua River, Dole Road, and the railroad using a single Direct Pipe crossing. Because of subsurface geotechnical conditions the HDD crossing method has been determined to be infeasible. This crossing method/location avoids the need to use a diverted open cut to cross the South Umpqua River on the 2009 FEIS route or an open cut crossing on Reroute 67.6.	Oregon Coast ESU Coho, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Aug 31	--	--	--
Trib. to South Umpqua River (SS-100-016)	Intermittent N/A	71.37	-	-	Adjacent to centerline within ROW	Not crossed by centerline. This waterbody passes through a culvert on a road which is encompassed by TEWA 71.25 which would not affect the waterbody.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-017)	Intermittent N/A	71.69	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent headwater tributary expected to be dry during construction and will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to South Umpqua River (SS-100-018)	Intermittent Minor	72.82	3.17	6.57	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-019)	Intermittent Minor	72.96	3.55	7.36	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-021)	Intermittent Intermediate	73.21	20.99	43.53	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (SS-100-020)	Intermittent Minor	73.41	3.10	6.43	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Richardson Creek (SS-100-022)	Intermittent Minor	74.03	1.58	3.28	Dry Open-Cut	Dry open-cut methods feasible/practical on 2'to 3' foot wide headwater tributary which is expected to be dry at the time of construction. If flowing, crossing would be completed during low flows periods within ODFW in-water work windows.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Myrtle Creek (HUC 1710030210) Fifth field Watershed [8], Douglas County, Oregon													
Bilger Creek (BSP001)	Perennial Minor	76.38	6.30	13.07	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide tributary. ROW necked down and TEWAs set in existing cleared areas to minimize riparian impacts. ODFW fish passage barrier data indicate two potential downstream barriers (RecordID 2571 & 2603).	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Little Lick (BSP006)	Perennial Minor	77.71	7.20	14.93	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on small 7' wide tributary. No additional workspace required. Steep topographic conditions make a conventional bore impractical because of extensive grading/excavation requirements as well as subsequent riparian disturbance.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to Little Lick Creek (BSI008)	Intermittent Intermediate	77.93	12.59	26.11	Dry Open-Cut	Dry open-cut methods feasible/practical intermittent tributary if flowing at time of construction. The tributary within the TEWA would be matted and silt fenced installed as necessary to minimize disturbance and the potential for sedimentation.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to Little Lick Creek (BSI010)	Intermittent Minor	78.02	2.01	4.17	Dry Open-Cut	Dry open-cut methods feasible/practical small 2' wide intermittent tributary if flowing at time of construction. The tributary within the TEWA would be matted and silt fenced installed as necessary to minimize disturbance and the potential for sedimentation.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
North Myrtle Creek (NSP037)	Perennial Intermediate	79.12	47.99	99.53	Dry Open-Cut (Streambed – bedrock)[6] Level 2[13]	Dry open-cut methods feasible/practical during low flow periods within ODFW in-water work window. (USGS Gage Station 14311000 records mean monthly flow as 5.8, 3.5 & 5.1 cfs respectively for Jul, Aug & Sep). ROW necked down to 75' to minimize riparian impacts.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--
Trib. to North Myrtle Creek (NSP038)	Perennial Minor	79.15	8.00	16.59	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 8.0' wide trib. if flowing at time of construction.	Oregon Coast ESU Coho, assumed habitat T	Assumed	Coho Assumed	Jul 1 to Sep 15	--	--	--
South Myrtle Creek (BSP172)	Perennial Intermediate	81.19	68.77	142.63	Dry Open-Cut (Streambed – bedrock)[6] Level 2[13]	Dry open-cut methods feasible/practical during low flow periods within ODFW in-water work window. (USGS Gage Station 14310700 records mean monthly flow as 5.6, 3.2 & 5.0 cfs, respectively for Jul, Aug & Sep). ROW necked down to 75' and TEWAs placed in existing cleared areas where feasible to minimize riparian impacts. Conventional bore not feasible/practical because of grading/excavation requirements on north side of stream.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to S. Myrtle Creek (BSP259)	Intermittent Minor	81.40	1.71	3.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2.0' wide trib. if flowing at time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to S. Myrtle Creek (SS-100-023)	Intermittent N/A	81.45	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent tributary expected to be dry during construction and will be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to S. Myrtle Creek (SS-100-024)	Intermittent N/A	81.78	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Tributary is within UCSA and will not be affected; headwater tributary expected to be dry during construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Klamath Mountains Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Days Creek-South Umpqua River (HUC 1710030205) Fifth field Watershed [8], Douglas County, Oregon													
Wood Creek (BSP226)	Perennial Minor	84.18	8.22	17.05	Dry Open-Cut (Streambed-bedrock) [6] Level 1 [13]	Dry open-cut methods feasible/practical on small 8' wide stream. Steep topographic conditions on either side of waterbody prevent conventional bore. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. StreamNet data indicates anadromy below crossing (~ 1 mile).	None	None	Coho	Jul 1 to Sep 15	--	--	--
Trib. to Fate Creek (BSI236)	Intermittent Minor	88.20	6.07	12.59	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small intermittent ditched trib. if flowing at time of construction. Appropriate BMPs would be installed to minimize disturbance/sedimentation if flowing at the time of construction.	None	Unknown	Chinook, Coho	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Fate Creek (BSP232)	Perennial Intermediate	88.48	12.11	25.12	Dry Open-Cut (Streambed-bedrock) [6] Level 1 [13]	Dry open-cut methods feasible/practical on 12' wide stream. Stream flow expected to be insignificant during low flow periods within ODFW in-water work period. TEWAs placed in existing cleared areas and alignment selected to minimize riparian impacts. ODFW fish passage barrier data indicates that immediately downstream of crossing (RecordID 2602): "Gabion below forms pool and creates a probable impassable juvenile barrier. Adults may pass at higher flows. Additional STEP work above culvert" A conventional bore is probable based on topography and geometry but geotechnical investigations have not been completed to confirm. A bridge is required at the crossing which would require bank grading for access. Significant costs, time requirements and the need for a bridge were the determinants for the proposed dry open-cut crossing method. Significant cultural resource sites occur in the area and a dry open-cut crossing will minimize excavation/grading disturbance compared to conventional bore.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead	Coho Assumed	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Days Creek (BSP233)	Perennial Intermediate	88.60	58.99	122.35	Dry Open-Cut (Streambed-bedrock) [6] Level 1 [13]	Dry open-cut methods feasible/practical on stream during low flow periods within ODFW in-water work window. (USGS Gage Station 14308700 records mean monthly flow as 2.2, 1.0 & 1.5 cfs, respectively for Jul, Aug & Sep). The ROW has been necked down to 75' and TEWAs located in previously disturbed areas to minimize riparian impacts. A conventional bore is probable based on topography and geometry but geotechnical investigations have not been completed to confirm. A bridge is required at the crossing which would require bank grading for access. Significant costs, time requirements and the need for a bridge were the determinants for the proposed dry open-cut crossing method. Significant cultural resource sites occur in the area and a dry open-cut crossing will minimize excavation/grading disturbance compared to conventional bore.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	None	Jul 1 to Sep 15	--	--	--
Cascades Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Days Creek-South Umpqua River (HUC 1710030205) Fifth field Watershed [8, 9], Douglas County, Oregon													
Saint John Creek (ASP303)	Perennial Intermediate	92.62	39.98	82.92	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical during low flow periods within ODFW in-water work window. Steep topographic conditions on either side of creek prevent conventional bore. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate issues/risk of threading pipe string under flume within the incised valley.	Oregon Coast ESU Coho, spawning, rearing habitat T, CH	Coho, Winter Steelhead,	Coho	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
South Umpqua River (ASP196)	Perennial Major	94.73	204.92	425.02	Diverted Open-Cut Level 2[13]	Diverted open-cut methods feasible/practical during low flow periods within ODFW in-water work window. (USGS Gage Station 143308600 records mean monthly flow as 168, 91 & 110 cfs, respectively for Jul, Aug & Sep). ROW and TEWAs locations primarily affect shrub vegetation. Temporary bridge required at crossing because the existing bridge at Milo is not expected to handle project weight limits. Heavy equipment access from the south is restricted by topographic constraints therefore temporary bridge at crossing is critical to facilitate construction (i.e., movement of materials and equipment along ROW). Because of geometry and topographic conditions, the only feasible HDD alignment required the alignment to pass immediately adjacent to the north side of the Milo Academy. From the exit point on the east side of the academy the route then needed to circle back to the west passing immediately adjacent to the south side of the academy. The HDD alignment ultimately required the academy to be encircled by the pipeline on three sides. This alignment would extensively encumber the academy and was determined to be impractical. A conventional bore is feasible based on topography and geometry but geotechnical investigations have not been completed to confirm. If subsoils are similar as surface conditions (cobbles), a bore would be infeasible. Because a bridge is required at the crossing which would require bank grading for access the diverted open-cut crossing method was selected as most appropriate crossing method based on feasibility/practicality and the method with the least risk.	Oregon Coast ESU Coho, spawning, rearing, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jul 1 to Aug 31	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to South Umpqua River (ASI193)	Intermittent Intermediate	94.85	15.28	31.69	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at the time of construction.	Oregon Coast ESU Coho, assumed habitat T	Unknown	Coho Assumed	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua River (ASI193)	Intermittent Intermediate	95.03	10.34	21.45	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent tributary if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to South Umpqua (ASI190)	Intermittent Minor	98.46	8.65	17.95	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 2-4' wide intermittent tributary (ditch) if flowing at the time of construction	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Cascades Ecoregion, South Umpqua (HUC 17100302) Sub-basin, Upper Cow Creek (HUC 1710030206) Fifth field Watershed [8], Douglas County, Oregon													
Naturally Occurring Mineralized Mercury	Near Perennial and Intermittent Waters	Potential Throughout Upper Cow Creek Watershed (MP 109.0 to 110.0)	Variable	Variable	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater wetland/tributary-if flowing at the time of construction.	None	Unknown	None	Jul 1 to Sep 15	No tailings have been identified within the planned construction right-of-way. The erosion and sediment control BMPs described in the footnotes below are expected to address the management of materials containing naturally occurring metals, such as mercury.		
Trib. to East Fork Cow Creek (GW014/FS-HF-C)	Perennial (FS – Interpretation) Intermediate	109.17	12.02	24.91	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater wetland/tributary-if flowing at the time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
Trib. to East Fork Cow Creek (GSI016/FS-HF-F)	Intermittent Minor	109.33	7.54	15.64	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide headwater intermittent tributary if flowing at the time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
East Fork Cow Creek (GSP019/FS-HF-G/ASP297)	Perennial Intermediate	109.47	26.31	54.57	Dry Open-Cut (Streambed-bedrock) [6]	Dry open-cut methods feasible/practical on small headwater stream during low flow periods within ODFW in-water work period. No additional work areas proposed.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
East Fork Cow Creek (GSP022/FS-HF-M ASP297)	Perennial Intermediate	109.69	-	-	Adjacent to centerline within TEWA	Not crossed by centerline. Waterbody flows through culvert on road which is encompassed by TEWA 109.68-N. This TEWA was selected for parking/staging as well as for potential mitigation to remove the culvert if the road is not required.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Trib. to East Fork Cow Creek (FS-HF-J)	Perennial Minor	109.69	10.27	21.30	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' headwater tributary. ROW necked down to 75' and TEWAs only utilized on north side of creek to minimize riparian impacts. Steep topographic conditions prevent a conventional bore because of extensive grading/excavation requirements.	None	Unknown	None	Jul 1 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to East Fork Cow Creek (FS-HF-K)	Perennial Minor	109.78	5.16	10.70	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-4' headwater tributary. ROW necked down to 75' and no TEWAs utilized to minimize riparian impacts.	None	Unknown	None	Jul 1 to Sep 15	--	--	--
Cascades Ecoregion, South Umpqua Sub-basin (HUC 17100302), Upper Cow Creek (HUC 1710030206) Fifth field Watershed [8], Jackson County, Oregon													
Trib. to East Fork Cow Creek (ESI068/FS-HF-N)	Intermittent Intermediate	110.98	16.41	34.04	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2-4' headwater tributary which is expected to be dry at the time of construction.	None	None	None	Jul 1 to Sep 15	--	--	--
Cascades Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Trail Creek (HUC 1710030706) Fifth field Watershed [8], Jackson County, Oregon													
Trib. to W. Fork Trail Creek (ESI068)	Intermittent Minor	110.76	-	-	Adjacent to centerline within TEWA 110.73	Small 1-2' wide ephemeral drainage located Peavine Quarry within TEWA; drainage to be avoided by construction; drainage expected to be dry during construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
West Fork Trail Creek (ASP202)	Perennial Intermediate	118.89	24.77	50.38	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods practical/feasible during low flow periods during ODFW in-water work window. ROW necked down to 75' and TEWAs located in previously disturbed areas to minimize riparian impacts.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead, Winter Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Trib. to Trail Creek (RS019)	Intermittent Intermediate	119.83	25.48	52.85	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Trail Creek (Denied Access16)	Intermittent Minor	119.90	1.84	3.82	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater tributary if flowing at the time of construction (Denied Access).	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Canyon Creek (NSP011)	Perennial Minor	120.45	6.61	13.71	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical on small 7' wide tributary during low flow periods within ODFW in-water work window. Only UCSAs utilized at crossing to minimize impacts to riparian areas.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Trib. to Trail Creek (ASI205)	Intermittent Minor	120.92	6.39	13.25	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide intermittent headwater tributary if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Trail Creek (ASI206)	Intermittent Intermediate	121.58	13.81	28.64	Dry Open-Cut	Dry open-cut methods feasible/practical on 12' wide intermittent tributary if flowing at the time of construction. No additional workspace required.	SONCC Coho, spawning, rearomg habitat T, CH	Coho	Coho	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Cascades Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Shady Cove-Rogue River (HUC 1710030707) Fifth field Watershed [8], Jackson County, Oregon													
Trib. to Cricket Creek (ESI071)	Intermittent Minor	121.87	-	-	Adjacent to centerline within ROW	Small 1' wide ephemeral stream expected to be dry during construction when the Rogue River HDD pullback would cross this tributary. Rollers would be used to span tributary with HDD pullback string.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Cricket Creek (ESI070)	Intermittent Minor	121.89	-	-	Adjacent to centerline within ROW	Small 7' wide intermittent stream expected to be dry during construction when the Rogue River HDD pullback would cross this tributary. Rollers would be used to span tributary with HDD pullback string.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Cricket Creek (ESI072)	Intermittent Minor	121.93	-	-	Adjacent to centerline within ROW	Small 2' wide ephemeral stream expected to be dry during construction when the Rogue River HDD pullback would occur, however this drainage would be avoided by construction activities.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Cricket Creek (ESI073)	Intermittent Minor	121.94	-	-	Adjacent to centerline within ROW	Small 2' wide ephemeral stream expected to be dry during construction when the Rogue River HDD pullback would occur, however this drainage would be avoided by construction activities.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Cricket Creek (ESI074)	Intermittent Minor	122.09	-	-	Adjacent to centerline within ROW	Small 2' wide ephemeral stream expected to be dry during construction when the Rogue River HDD pullback would occur.	None	Unknown		Jun 15 to Sep 15	--	--	--
Rogue River (ASP235)	Perennial Major	122.65	244.59	611.48	HDD	HDD feasible based on geometry, topography and geotechnical conditions along proposed alignment. Primary HDD activities are significantly set back from crossing and would not be visible from the highway or the river Conventional bore not feasible/practical because highway and topographic constraints on the west side of the crossing Dry open-cut or diverted open-cut methods not practical/feasible based on flow and channel characteristics (USGS Gage Station 14339000 records mean monthly flow as 2,170, 2,160 and 1,710 respectively for Jul, Aug & Sep).	SONCC Coho, rearing, migration habitat T, CH	Spring Chinook, Fall Chinook, Coho, Summer Steelhead, Winter Steelhead, Pacific Lamprey	Chinook, Coho	Jun 15 to Aug 31	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Indian Creek (ASI223)	Intermittent Major	125.91	4.87	10.10	Dry Open-Cut	Dry open-cut methods feasible/practical on small <5' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI222)	Intermittent Major	125.98	5.43	11.26	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (RS004)	Intermittent Minor	126.50	1.18	2.45	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI220)	Intermittent Minor	126.52	4.08	8.46	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI221)	Intermittent Minor	126.59	5.65	11.72	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (RS003)	Intermittent Minor	126.59	-	-	Adjacent to centerline within ROW	Not crossed by the centerline. Small headwater tributary expected to be dry at the time of construction and would be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI311)	Intermittent Minor	126.65	3.29	6.82	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater tributary if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Deer Creek (ASP307)	Perennial Intermediate	128.49	28.52	59.15	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical during low flow periods within ODFW in-water work window. No additional workspace required. StreamNet data reports anadromy below crossing (~ 2 miles).	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Indian Creek (AW278)	Perennial Minor	128.63	<10	614.92	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical small < 10' wide stream low flow periods within ODFW in-water work window. Stream located in heavily grazed irrigated pasture and riparian vegetation consists of emergent pasture species. StreamNet data reports anadromy below crossing (~ 2 miles).	SONCC Coho assumed habitat T, CH	Assumed	Coho Assumed	Jun 15 to Sep 15	--	--	--
Trib. To Indian Creek (ASP310)	Perennial Minor	128.70	5.22	10.83	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical small 5' wide ditch tributary located in heavily grazed irrigated pasture. StreamNet data reports anadromy below crossing (~ 2 miles).	None	Unknown	None	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. To Indian Creek (AW309)	Intermittent Intermediate	128.89	30.00	62.22	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 10 wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. To Indian Creek (ASI400)	Intermittent Minor	129.13	1.42	2.95	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3-4' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. To Indian Creek (ASI306)	Intermittent Minor	129.21	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small headwater tributary expected to be dry at the time of construction and would be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Indian Creek (ASI277)	Intermittent Minor	129.48	4.04	8.38	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3-4' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Cascades Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Big Butte Creek (HUC 1710030704) Fifth field Watershed [8], Jackson County, Oregon													
Trib. to Neil Creek (AW245)	Intermittent Minor	130.84	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small tributary expected to be dry at the time of construction and would be restored to approximate original contour and grade during restoration.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Neil Creek (AW244)	Intermittent Major	130.85	131.84	273.45	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small < 10' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Neil Creek (ASI246)	Intermittent Minor	130.89	2.02	4.19	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent headwater trib. if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Neil Creek (ASI250)	Intermittent Minor	131.55	4.79	9.93	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5' wide intermittent headwater trib. if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Neil Creek (ASI251)	Intermittent Minor	131.72	3.95	8.19	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent headwater tributary.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Neil Creek (ASP252)	Perennial Intermediate	132.00	39.41	81.74	Dry Open-Cut (Streambed – bedrock)[6] Level 1	Dry open-cut methods feasible/practical during low flow within ODFW in-water work window. ROW narrowed to 75 feet and TEWAs placed in pasture to minimize riparian impacts.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Quartz Creek (ASI265)	Intermittent Minor	132.75	2.36	4.89	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 2' wide intermittent stream if flowing at the time of construction.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead	Coho	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Quartz Creek (AW264)	Intermittent Intermediate	132.77	40.44	83.88	Dry Open-Cut (streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small intermittent stream/wetland, if flowing at the time of construction. ROW necked down to 75' and TEWAs set back to minimize riparian impacts.	SONCC Coho possible habitat T, CH	Coho possible	Coho possible	Jun 15 to Sep 15	--	--	--
Trib. to Quartz Creek (ASP241)	Perennial Intermediate	133.35	44.80	92.92	Dry Open-Cut	Tributary will likely be crossed with the bore of the Medford Aqueduct.	SONCC Coho assumed habitat T	Unknown	Coho Assumed	Jun 15 to Sep 15	--	--	--
Medford Aqueduct Ditch 3 (ASP240)	Perennial Intermediate	133.38	29.36	60.89	Conventional Bore	Proposed conventional bore feasible/practical based on flow volume, channel geometry and potential risk in disturbing man-made aqueduct. Dry open cut feasible	SONCC Coho assumed habitat T	Unknown	Coho Assumed	Jun 15 to Sep 15	--	--	--
Cascades Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Little Butte Creek (HUC 1710030708) Fifth field Watershed[8], Jackson County, Oregon													
Whiskey Creek (ASI207)	Intermittent Intermediate	137.48	10.37	21.51	Dry Open-Cut	Dry open-cut methods feasible/practical on small 10' wide intermittent headwater stream if flowing at the time of construction. ROW necked down to 75' and TEWAs set back to minimize riparian impacts.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI208)	Intermittent Intermediate	138.26	10.37	21.51	Dry Open-Cut	Dry open-cut methods feasible/practical on small 10' wide intermittent headwater stream if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI210)	Intermittent Minor	138.45	1.72	3.57	Dry Open-Cut	Dry open-cut methods feasible/practical on small <10' wide intermittent headwater stream if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI211)	Intermittent Minor	138.71	7.22	14.98	Dry Open-Cut	Dry open-cut methods feasible/practical on small 7' wide intermittent headwater stream if flowing at the time of construction. No additional workspace required.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI214)	Intermittent Minor	139.15	6.99	14.50	Dry Open-Cut	Dry open-cut methods feasible/practical on small 7' wide intermittent headwater stream if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Stock Pond (AL215)	Stock pond N/A	139.17	54.30	112.62	Dry Open-Cut	Man-made stock pond to be reconstructed after construction	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI216)	Intermittent Intermediate	139.19	10.31	21.38	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater stream if flowing at the time of construction. No additional workspace required.	None	None	None	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Lick Creek (ASI216)	Intermittent Intermediate	139.21	13.05	27.07	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater stream if flowing at the time of construction. No additional workspace required.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI217)	Intermittent Intermediate	139.39	15.84	32.85	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater stream if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI226)	Intermittent Minor	139.59	6.59	13.67	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 7’ wide intermittent headwater stream if flowing at the time of construction. ROW necked down to 75 feet and TEWAs located in existing disturbed pasture to minimize riparian impacts.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI227)	Intermittent Intermediate	139.63	10.91	22.63	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 1-2’ wide intermittent headwater stream if flowing at the time of construction. ROW necked down to 75 feet and no TEWAs utilized to minimize riparian impacts.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI228)	Intermittent Intermediate	139.68	31.75	65.85	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1-2’ wide intermittent headwater drainage if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI229)	Intermittent Minor	139.72	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Small intermittent headwater drainage not expected to be flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Lick Creek (ASI232)	Intermittent Minor	139.83	1.20	2.49	Dry Open-Cut	Dry open-cut methods feasible/practical on small 1’ wide intermittent headwater drainage if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Lick Creek (ASI233)	Intermittent Intermediate	140.26	12.33	25.57	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on intermittent drainage if flowing at the time of construction. Dam and pump crossing method most logical dry open-cut method based on topographic conditions to eliminate difficulties of threading pipe string under flume with associated safety risks including upsetting flume during process. ROW necked down to 75’ and TEWAs set back to minimize riparian impacts. StreamNet data indicates anadromy below crossing (~ 2 miles)	SONCC Coho assumed habitat T	Assumed	Coho Assumed	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Trib. to Lick Creek (ASI189)	Intermittent Minor	140.58	2.62	5.43	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ASI187)	Intermittent Minor	141.17	2.51	5.21	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ASI188)	Intermittent Intermediate	141.44	43.20	89.60	Dry Open-Cut (Streambed – bedrock)[6]	Dry open-cut methods feasible/practical on small intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (RS017)	Intermittent Minor	141.49	4.45	9.23	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater trib., if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ESI030)	Intermittent Minor	141.95	6.25	12.96	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6' wide intermittent headwater trib. if flowing at the time of construction. No additional workspace required.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ESI031)	Intermittent Intermediate	142.36	13.44	27.88	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent headwater trib. if flowing at the time of construction. Altered trib. part of pasture irrigation system.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Salt Creek (ESP034)	Perennial Intermediate	142.57	41.32	85.70	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on creek during low flow period within ODFW in-water work window. ROW necked down to 75' and TEWAs located in existing disturbed pasture to minimize riparian impacts. Bore not practical because both bore pits would be located in wetland likely requiring significant dewatering efforts to access bore pits.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Trib. to Salt Creek (ESI037)	Intermittent Minor	143.10	4.84	10.04	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent headwater trib. if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Long Branch Creek (ESI038)	Intermittent Minor	143.47	2.21	4.58	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to Long Branch Creek (ESI039)	Intermittent Minor	143.71	3.26	6.76	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Stock Pond (EL041)	Stock Pond N/A	143.73	-	-	Adjacent to centerline within ROW	Man-made pond expected to be dry at the time of construction and the pond will be reestablished after construction	None	None	None	Jun 15 to Sep 15	--	--	--
Trib. to Long Branch Creek (ESI038)	Intermittent Minor	143.73	-	-	Adjacent to centerline within ROW	Not crossed by centerline. Intermittent drainage on very edge of TEWA; likely can be avoided during construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Long Branch Creek (ESI040)	Intermittent Minor	143.74	5.05	10.47	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to Long Branch Creek (ESI038)	Intermittent Minor	144.11	2.04	4.23	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent headwater trib. if flowing at the time of construction.	SONCC Coho, assumed habitat T	Coho Assumed Summer Steelhead	Coho Assumed	Jun 15 to Sep 15	--	--	--
Trib. to S. Fork Long Branch (GSP005/ESP048)	Perennial Minor	144.70	7.09	14.71	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction.	SONCC Coho assumed habitat T	Assumed	Coho Assumed	Jun 15 to Sep 15	--	--	--
South Fork Long Branch Cr (GPS006/ESP059)	Intermittent Minor	145.27	7.12	14.77	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent headwater trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
Trib. to S. Fork Long Branch (ESI061)	Intermittent Intermediate	145.54	13.66	28.33	Dry Open-Cut	Dry open-cut methods feasible/practical on small intermittent trib. if flowing at the time of construction.	None	Unknown	None	Jun 15 to Sep 15	--	--	--
North Fork Little Butte Creek (ESP066)	Perennial Intermediate	145.69	48.77	101.15	Dry Open-Cut Level 2	Dry open-cut methods feasible/practical on stream during ODFW in-water work window. USGS Gage Station 1434300 reports that mean monthly flow are 89, 111, 105 and 67 for Jun, Jul, Aug and Sep, respectively. Flows in Jul and Aug are highest yearly flow periods for creek. TEWA set back and located primarily in previously disturbed (pastures) areas to minimize riparian impacts.	SONCC Coho, spawning, rearing habitat T, CH	Coho, Summer Steelhead, Winter Steelhead	Coho	Jun 15 to Sep 15	--	--	--
Trib. to N. Fork Little Butte Creek (ESI056)	Intermittent Intermediate	146.05	17.49	36.28	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent trib, if flowing at the time of construction. No additional workspace required.	SONCC Coho possible habitat T	Coho possible	Coho possible	Jun 15 to Sep 15	--	--	--
Trib. to N. Fork Little Butte Creek (ESI055)	Intermittent Minor	146.38	3.36	6.97	Dry Open-Cut	Dry open-cut methods feasible/practical on small 2' wide intermittent trib. if flowing at the time of construction.	SONCC Coho possible habitat T	Coho possible	Coho possible	Jun 15 to Sep 15	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Trib. to N. Fork Little Butte Creek (ESI052)	Intermittent Intermediate	146.75	-	-	Adjacent to ROW	Not crossed by centerline or ROW.	None	None	None	Jun 15 to Sep 15	--	--	--
Stock Pond (AL169)	Stock Pond N/A	152.33	-	-	Adjacent to TEWA 152.29-N	Stock pond not to be disturbed by construction activities.	None	None	None	Jun 15 to Sep 15	--	--	--
Eastern Slopes Ecoregion, Upper Rogue (HUC 17100307) Sub-basin, Little Butte Creek (HUC 1710030708) Fifth field Watershed [8, 9], Jackson County, Oregon													
South Fork Little Butte Creek (ASP165)	Perennial Intermediate	162.45	19.62	40.69	Dry Open-Cut Level 1	Dry-open cut feasible and practical on creek. ODFW fish passage barrier data (RecordID 51163) indicates that downstream irrigation diversion dam/barrier (~ 0.5 miles): is unladdered and impassible. USGS Gage Station 14339500 – located below diversion reports monthly mean flow of 14, 12 and 11 cfs, respectively for Jul, Aug & Sep. ROW necked down to 75 feet and TEWAs set back to minimize riparian impacts.	None	None	None	Jun 15 to Sep 15	--	--	--
Daley Creek (ESI076)	Intermittent Intermediate	166.21	25.51	52.961	Dry Open-Cut	Dry open-cut methods feasible/practical on small headwater intermittent trib. if flowing at the time of construction.	None	None	None	Jun 15 to Sep 15	--	--	--
Eastern Slopes Ecoregion, Upper Klamath River (HUC 18010206) Sub-basin, Spencer Creek (HUC 1801020601) Fifth field Watershed [8, 9], Klamath County, Oregon													
Spencer Creek (EW085)	Intermittent Minor	171.07	3.81	7.90	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 10' wide stream with associated wetland. ROW necked down 75 feet and TEWAs set back or located to the edge of existing road disturbance to minimize riparian and wetland impacts. Conventional bore not practical because of topographic conditions and grading/excavation requirements on the south side of creek.	None	None	None	Aug 1 to Sep 30	--	--	--
Trib. to Spencer Creek (GSP007)	Perennial Minor	171.57	4.05	8.40	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 2' wide intermittent trib/wetland. if flowing at the time of construction.	None	None	None	Aug 1 to Sep 30	--	--	--
Trib. to Spencer Creek (EW107)	Intermittent Minor	172.48	4.34	9.00	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 10' wide intermittent trib. if flowing at the time of construction. ROW necked down 75 feet and TEWAs set back to minimize riparian and wetland impacts.	None	None	None	Aug 1 to Sep 30	--	--	--
Trib. to Spencer Creek (ESI106)	Intermittent Minor	173.74	8.17	16.95	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 5' wide ephemeral trib. if flowing at the time of construction.	None	None	None	Aug 1 to Sep 30	--	--	--

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Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Trib. to Spencer Creek (ESI069/GSI010)	Intermittent Minor	176.55	2.02	4.19	Dry Open-Cut	Dry open-cut methods feasible/practical on small < 4' wide intermittent trib. if flowing at the time of construction.	None	None	None	Aug 1 to Sep 30	--	--	--
Clover Creek (EW103/GSI011)	Intermittent Minor	177.76	5.14	10.66	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on small < 10' wide intermittent trib. if flowing at the time of construction. No additional workspace required.	None	None	None	Aug 1 to Sep 30	--	--	--
Eastern Slopes Ecoregion, Upper Klamath River (HUC 18010206) Sub-basin, John C Boyle Reservoir-Klamath River (HUC 1801020602) Fifth field Watershed [8], Klamath County, Oregon													
Trib. to Klamath River (ESI097)	Intermittent Minor	186.61	7.17	14.87	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent trib. if flowing at the time of construction. Intermittent stream feeds stock pond.	None	None	None	Jul 1 to Jan 31	--	--	--
Trib. to Klamath River (ESI099)	Intermittent Minor	186.65	2.64	5.48	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3' wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Jan 31	--	--	--
Trib. to Klamath River (ESI100)	Intermittent Intermediate	186.74	10.66	22.11	Dry Open-Cut	Small 2' wide intermittent tributary that runs adjacent to centerline within ROW. Tributary expected to be dry during construction and would be restored to approximate original contour and grade during restoration.	None	None	None	Jul 1 to Jan 31	--	--	--
Eastern Slopes Ecoregion, Lost (HUC 18010204) Sub-basin, Lake Ewauna-Upper Klamath River (HUC 1801020412) Fifth field Watershed [8], Klamath County, Oregon													
Trib. To Klamath River (ASI013/SS-100-025)	Intermittent Minor	188.90	3.16	6.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 4' wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Jan 31	--	--	--
Weyerhaeuser Pond (AL034)	Industrial Pond N/A	196.77	-	-	Adjacent to centerline within ROW	Pond will not be disturbed by construction activities. The pond may be used for discharge.	None	None	None	Jul 1 to Jan 31	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info
ECSI Site 655	Upland	South of ROW near MP 198.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	This 660-acre Weyerhaeuser facility is located south of the ROW in Klamath County. The site was originally a sawmill constructed in 1929. Operation of the mill was discontinued in 1992, and several buildings at the site have been demolished. An old landfill was present where wood waste and painted hardboard was burned; at least one paint drum was identified. High concentrations of Total Petroleum Hydrocarbons were observed at the sawmill and powerhouse facilities, and a stormwater outfall to the Klamath River was observed to have an oily sheen. In addition, sediment contamination was confirmed by high levels of arsenic, chromium, copper, mercury, polycyclic aromatic hydrocarbons and droplets of petroleum in most sediment samples. The ODEQ is concerned with groundwater contamination at the site and has scored the facility as a high priority for further action. Weyerhaeuser agreed to conduct additional sediment sampling for sediment bioassays and chemical analysis. ODEQ recommended that a risk assessment be conducted to determine the potential for residual contamination in sediment to affect human health (for example, recreational users) and the environment (for example, aquatic wildlife). This work has not been completed. The PCGP Project has been routed to the north and around this former mill location, which is currently occupied by Collins Forest Products; therefore disturbance to contaminated materials is unlikely. Trenching activities will occur up-gradient of the site; therefore any groundwater that may be encountered in the trench in this area should not be contaminated by the past activities at the mill. If trench dewatering is required in this area, Pacific Connector will coordinate with ODEQ to ensure compliance.
ECSI Site 2878	Upland	Near MP 199.0 off Pipeline ROW Klamath Falls Memorial Drive Contractor Yard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	The DG Shelter Products site is located in Klamath County and is also the same location as the PCGP Project's proposed Klamath Falls Memorial Drive Contractor Yard. This site, located near a portion of the Klamath River, was added to ODEQ's hazardous site database for tracking purposes because it is on ODEQ's 303d-list for toxics and an ODH health advisory is in effect. Site screening was recommended and completed in 2001. Currently, there are no additional actions listed for the site. The PCGP Project's proposed Klamath Falls Memorial Drive Contractor Yard is located at the DG Shelter Products site. The use of this potential yard will not require any excavation activities or ground disturbance; therefore contact with any potential site contamination is unlikely. Prior to utilizing this site as a project yard, Pacific Connector will further investigate the status of this site with the ODEQ.

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information													
Waterbody Info		**Project Info**					**Fisheries Info**				**Contaminants Info**		
Waterbody/ Cleanup Site (in gray)	**Type**	**Milepost**	**Crossing Width (feet)**	**Excavated Volume at Crossing (cy)**	**Crossing Method**	**Waterbody Crossing Rationale**	**ESA Species/ Critical Habitat Present**	**Anadromous Species Present**	**EFH Species Present**	**Fishery Construction Window**	**Cleanup Site/Mine Site Info**		
Klamath River (ASP151)	Perennial Major	199.38	-	-	HDD Level 1	HDD feasible/practical based on river crossing width (~ 1000') flow volumes, topography, geotechnical and geometry conditions. Dry open-cut infeasible because of width and flow volume. USGS Gage Station 11507501 records mean monthly discharge of 1,190, 1,060, 1,120 cfs respectively for Jul, Aug, Sep.	Lost River Sucker E, CH Shortnose Sucker E, CH	Pacific Lamprey	None	Jul 1 to Jan 31	--	--	--
ECSI Site 2785	Upland	0.38 mile E of ROW near MP 206.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Mac's Store is located in Klamath County east of MP 206.0. The site is listed in the ODEQ hazardous waste site database due to a suspected underground fuel spill. It was recommended for site screening in 2001. Concentrations of petroleum hydrocarbons and volatile organic compounds (VOCs) were not detected in water samples collected from nearby wells in 2006 and 2007. No impacts to drinking water wells have historically been observed. In 2008, two soil borings were installed by ODEQ. Groundwater monitoring of wells MW-1, MW-4, MW-5, and the Store/residential well was performed on 2009. ODEQ has determined that no further action is required to address contamination at the site. This site is located approximately 0.38 mile east of the project alignment near MP 206.0; therefore it is unlikely that trenching activities will encounter any contaminated sediments or groundwater potentially associated with this site. Pacific Connector's proposed Klamath Falls North Cross Roads East Construction Yard is located immediately adjacent to the PCGP alignment at MP 206.0 and will be within 0.25 mile of this site. However, since no trenching or other excavation activities will occur at this proposed yard, potential contact with contaminated groundwater will not occur.		
Eastern Slopes Ecoregion, Lost (HUC 18010204) Sub-basin, Mills Creek-Lost River (HUC 1801020409) Fifth field Watershed [8], Klamath County, Oregon													
Lost River (NSP001)	Perennial Major	212.05	118.38	245.53	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical during low flow periods during ODFW in-water work window. An HDD and conventional bore are likely probable at the approximate crossing location based on the topography, geometry and expected geotechnical conditions. Landowner restricted access for geotechnical investigations. Significant costs, time requirements were the determinants for the proposed dry open-cut method.	Lost River Sucker E Shortnose Sucker E	None	None	Jul 1 to Mar 31	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info		
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info		
Unnamed Creek (ASI051)	Intermittent Intermediate	216.10	12.80	26.55	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6-12’ wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Mar 31	--	--	--
Unnamed Creek (ASI052)	Intermittent Minor	216.11	3.01	6.24	Dry Open-Cut	Dry open-cut methods feasible/practical on small 3’ wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Mar 31	--	--	--
Unnamed Creek (ASI050)	Intermittent Intermediate	216.30	25.23	52.33	Dry Open-Cut	Dry open-cut methods feasible/practical on intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Mar 31	--	--	--
Unnamed Creek (ASI049)	Intermittent Minor	216.43	6.95	14.41	Dry Open-Cut	Dry open-cut methods feasible/practical on small 6’ wide intermittent trib. if flowing at the time of construction.	None	None	None	Jul 1 to Mar 31	--	--	--
Trib. to D Canal (ASI136)	Intermittent Intermediate	218.09	23.48	48.70	Dry Open-Cut	Dry open-cut methods feasible/practical on intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Trib. to D Canal (ASI37)	Intermittent Minor	218.46	3.06	6.35	Dry Open-Cut (Streambed-bedrock)[6]	Dry open-cut methods feasible/practical on small 3’ wide intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Trib. to D Canal (ASI291)	Intermittent Minor	219.69	1.28	2.65	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on small 1’ wide intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Excavated Pond (NL116)	Excavated Pond N/A	219.70	-	-	Off ROW – Temp Extra Workspace	Pond will not be disturbed by construction activities. The pond may be used for a water source for dust control.	None	None	None	Jul 1 to Mar 31	--	--	--
Unnamed Creek (ASI138)	Intermittent Minor	221.77	5.02	10.41	Dry Open-Cut	Dry open-cut methods feasible/practical on small 5’ wide intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Pond (EL077)	Pond N/A	222.84	-	-	Adjacent to centerline within ROW	Pond will not be disturbed by construction activities. The pond may be used for a water source for dust control.	None	None	None	Jul 1 to Mar 31	--	--	--
Trib. to V Canal (ESI050)	Intermittent Minor	224.95	-	-	Adjacent to centerline within ROW	Intermittent trib. will not be disturbed by project disposal activities within county landfill/quarry.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Trib. to V Canal (ESI051)	Intermittent Minor	224.95	-	-	Adjacent to centerline within ROW	Intermittent trib. will not be disturbed by project disposal activities within county landfill/quarry.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--
Trib. to V Canal (ASI140)	Intermittent Intermediate	225.07	28.33	58.76	Dry Open-Cut Level 1	Dry open-cut methods feasible/practical on intermittent trib. if flowing at the time of construction.	Lost River Sucker potential E, Shortnose Sucker potential E	None	None	Jul 1 to Mar 31	--	--	--

Table A. Jordan Cove LNG Project and Pacific Connector Pipeline Project – SEF Level 1 Site History Information and Pipeline Stream Crossing Information

Waterbody Info		Project Info					Fisheries Info				Contaminants Info
Waterbody/ Cleanup Site (in gray)	Type	Milepost	Crossing Width (feet)	Excavated Volume at Crossing (cy)	Crossing Method	Waterbody Crossing Rationale	ESA Species/ Critical Habitat Present	Anadromous Species Present	EFH Species Present	Fishery Construction Window	Cleanup Site/Mine Site Info

1. Pacific Northwest Hydrography Framework, National Hydrography Dataset, Jones and Stokes Field Surveys from 2006, 2007, and 2009, StreamNet, photo interpretation, and consultation with BLM and Forest Service
2. USGS Hydrologic Unit Codes, from the WBD
3. Key Watershed
4. Jones and Stokes Wetland Survey Waterbody Identification Number
5. Pacific Northwest Hydrography Framework Clearinghouse Waterbody longitude/latitude unique identifier number.
6. Streambed bedrock based on Pacific Connector's Wetland and Waterbody delineation surveys (see Table C-3 in the Wetland Delineation Report, submitted as a stand alone report). Streambed bedrock may require special construction techniques to ensure pipeline design depth. Special construction techniques may include rock hammering, drilling and hammering, or blasting. The need for blasting would be determined by the contractor and would only be initiated after ODFW blasting permits are obtained.
7. Minor waterbody includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of construction; intermediate waterbody includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of construction; and major waterbody includes all waterbodies greater than 100 feet wide at the water's edge at the time of construction.
8. Oregon Department of Forestry Classifications: F – Fish, D- Domestic, N- none, * Domestic use yet to be determined.
9. Northwest Forest Plan Classifications: fish bearing streams (F), permanently flowing non-fish bearing streams (N), seasonally flowing or Intermittent streams (I), lakes and natural ponds (P)
10. Source: Oregon Department of Environmental Quality, 2010 Integrated Report GIS coverage. Cat: 4A – water quality Limited, TMDL approved, Cat: 4B – water quality limited, other control measures, Cat: 4C – water quality limited, not a pollutant, Cat: 5 – water quality limited, 303(d) list, TMDL needed.
11. Water quality limited within one mile of crossing, not at point of crossing.
12. FERC waterbody definitions:
    i. Minor = less than or equal to 10 feet wide
    ii. Intermediate = greater than 10 feet wide but less than or equal to 100 feet wide
    iii. Major = greater than 100 feet wide
13. Level 1 and 2 waterbodies have been identified; all others are Level 0. According to GeoEngineers 2013 Channel Migration and Scour Analysis for the PCGP Project, channel migration is defined as the lateral movement, over time, of an entire channel segment perpendicular to the direction of stream flow; channel avulsion is the sudden abandonment of an active channel for a newly created or previously abandoned channel located on the floodplain; channel widening is defined as erosion and subsequent recession of one or both stream banks that widens the channel without changing the channel location; streambed scour is erosion of the streambed resulting in the development of deep pools and/or the systematic lowering of the channel floor elevation.
    i. Level 0 = streams not likely subject to migration, avulsion and/or scour
    ii. Level 1 = streams with a moderate potential for migration, avulsion and/or scour
    iii. Level 2 = streams with a high potential for migration, avulsion and/or scour
14. Dry open-cut crossing methods include Flume or Dam and Pump procedures. Dam and Pump methods would be utilized where streambed blasting is anticipated to eliminate blasting around the flume. The Dam and Pump crossing method is the preferred crossing procedure in steep incised drainage valleys where worker safety may be compromised when placing ("threading") the pipe string under the flume pipe and where there is a risk of upsetting the flume during this operation. The Dam and Pump crossing method is also the preferred crossing method on small streams under low flow conditions during the recommended ODFW-recommended in-water work period. Pacific Connector requests permission for temporary/short-term fish passage restriction when completing Dam and Pump crossings within the ODFW-recommended in-water work period.
15. FWS, NMFS, and StreamNet. T = Threatened, E = Endangered, CH = Critical Habitat

Sediment Evaluation Framework (SEF)
Level 1 Site History Information

Applicant Provided Preliminary Information:

1. A map showing the project site location (include river mile if applicable), layout, existing storm drainages and outfalls, and special aquatic sites (e.g., wetlands, eelgrass beds, ponds, lakes).
2. Current project area land uses and history of site ownership and prior land uses.
3. Current and prior adjacent property land uses, especially those properties up gradient or upstream/current from the project site.
4. Site characteristics that could affect movement of CoCs (i.e. prop wash, barge/ferry traffic, port traffic, dredged navigational channels, bar scalping, instream dredging sites).
5. Outfalls information, such as construction year, type, flow volume (capacity), and non-point discharge elimination system (NPDES) data. Industrial processes at or near the site and hazardous substances used/generated at these sites
6. Specific information on Environmental Cleanup, brownfields, leaking storage tanks, etc., for the State of Oregon can be found at: http://www.oregon.gov/DEQ/. Specific site information on Oregon Cleanup Sites can be found at: http://www.deq.state.or.us/lq/ECSI/ecsi.htm.
7. In the State of Washington, this information can be found at http://www.ecy.wa.gov/cleanup.html or http://www.ecy.wa.gov/programs/tcp/mtca_gen/hazsites.html.
8. CERCLA-listed site information. See http://www.epa.gov/superfund/sites/npl/index.htm and information listed in no. 3, above.
9. Spill events. These sites may provide information:
   http://www.ecy.wa.gov/programs/spills/incidents/main.html
   http://www.deq.state.or.us/lq/ECSI/ecsi.htm
   http://www.fws.gov/oregonfwo/Contaminants/.
10. Results of any previous sampling and/or testing.
11. Any dredging activity and data/information from that activity.
12. Fill out Conceptual Site Model table, below. Guidance on completing the conceptual site model can be found in the "Supplemental Guidance for the Portland District: Sampling and Analysis Plan Preparation under the 2009 *Sediment Evaluation Framework for the Pacific Northwest.*," located on the District's Dredged Material Evaluation webpage: http://www.nwp.usace.army.mil/Missions/Environment/DMM.aspx

Table X. Conceptual Site Model (CSM) for Dredging and Disposal Activities.

SEDIMENT RELEASE FROM DREDGING AND UNCONFINED, AQUATIC PLACEMENT/DISPOSAL (if applicable)

Media of Concern (where chemicals of concern may be present)	**Release[1] Mechanism** (process that liberates or reveals chemicals of concern from media)	**Secondary Media** (other media impacted)	**Primary Pathway** (route from media to receptor)		**Potential Receptors**					
					Benthic Inverts.	Fish	ESA Species	Critical Habitat	Birds/Mammals	Humans
SEDIMENT →	**Resuspension**[2] (during dredging or aquatic disposal) →	Water column →	Direct Contact →							
	Generated Residuals[3] (redeposited from sloughing, dislodging, slope failure, or resettling during dredging or disposal) →	Settled sediment →	Direct Contact →							
			Dietary →	Tertiary Media, Tissue →						
	Undisturbed Residuals[4] (as uncovered during dredging- measured as the new surface material) →	Newly exposed sediment surface →	Direct Contact →							
			Dietary →	Tertiary Media, Tissue →						

Receptor Pathway Abbreviations: **C** = Pathway complete; **P** = Potentially complete pathway; **I** = Incomplete/insignificant pathway; NA = not applicable (e.g., NSM is bedrock or concrete)

[1] Release: the process by which the dredging operation results in the transfer of contaminants from sediment pore water and sediment particles into the water column or air (i.e., repartitioning). Contaminants in near-surface sediments (e.g., transport from redeposited sediment or residuals) may be released into the water column by densification, diffusion, and bioturbation (Bridges et. al., 2008).

[2] Resuspension: The process by which dredging and attended operations dislodge bedded sediment particles and disperse them into the water column. Resuspension rates range from <0.1% to over 5% (Bridges et. al., 2008).

[3] Redeposition: The process by which suspended particles resettle on the surface of the sediment after disturbance. Redeposition can occur in the near field (the plume area dominated by rapid settling velocities, changes in sediment total suspended concentration, and load with distance from the dredging operation) or the far field (the area where the total load in the plume is slowly varying and where advection, diffusion and settling are of the same order of magnitude).

[4] Residuals: Contaminated sediment found at the post-dredging surface of sediment profile, either within or adjacent to the dredging footprint (Bridges et. al., 2008). Examples include contaminated surface sediments uncovered by dredging, but not fully removed (e.g., newly exposed surface) or contaminated sediment dislodged from nearby slopes during dredging or slope failures. Although in-water disposal does not create undisturbed residuals, resuspended sediment particles settling at a site become part of the generated dredging residuals.

SEDIMENT RELEASE FROM OTHER TYPES OF DISPOSAL (not considered in the SEF)

	Disposal Method	**Disposal Location**	**Transport Processes** (Examples)
SEDIMENT →	Upland Disposal →	Upland Confined Aquatic Disposal (CDF)	The following upland processes are outside of the purview of SEF review: 1. Leaching 2. Surface runoff 3. Volatilization 4. Bioaccumulation Additional information on the evaluation of these disposal options can be found the following manuals: 1. Corps. 2003. Upland Testing Manual, ERD/EL TR-03-1. 2. EPA. 1998. Guidance for In Situ Subaqueous Capping of Contaminated Sediment, EPA 905-B96-004.
	Nearshore Disposal →	Nearshore CDF	
	Subaqueous Capping →	Engineered Cap	

QUICK REFERENCE CHART for RGL 16-01

APPROVED JDs	PRELIMINARY JDs
• An AJD is defined in Corps regulations at 33 CFR 331.2. A definitive, official determination that there are, or that there are not, jurisdictional aquatic resources on a parcel and the identification of the geographic limits of jurisdictional aquatic resources on a parcel, can only be made by means of an AJD.	• A JD requestor may elect to use a PJD to move ahead expeditiously to obtain a Corps permit authorization, where the requestor determines that it is in his or her best interest to do so. • May include the delineation limits of all aquatic resources on a parcel so long as the PJD does not determine the jurisdictional status of such aquatic resources.
• Will specify what aquatic resources are or are not jurisdictional on a parcel for purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures.	• A requestor may elect to use a PJD even where initial indications are that the aquatic resources on a site may not be jurisdictional, if the requestor makes an informed, voluntary decision that it is in his or her best interest not to request and obtain an AJD. • For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a PJD will treat all aquatic resources that would be affected in any way by the permitted activity on the site as jurisdictional aquatic resources. • When the Corps provides a PJD, or authorizes an activity based on a PJD, the Corps is making no legally binding determination of any type regarding whether jurisdiction exists over the particular aquatic resource in question.
• Remains valid for period of five years (subject to certain limited exceptions explained in RGL 05-02).	• Do not have expiration dates (see RGL 05-02).
• Can be administratively appealed through the Corps administrative appeal process set out at 33 CFR Part 331.	• A PJD is not an appealable action. A PJD is "preliminary" in the sense that a recipient of a PJD can later request and obtain an AJD if that becomes necessary or appropriate during the permit process or during the administrative appeal process.
• May be requested through the use of the "Request for Corps JD" included with RGL 16-01 as Appendix 1. Even if the JD requestor or Corps district does not use the "Request for Corps JD", the same information and signature provided in the "Request for Corps JD" should be submitted to the Corps district with each JD request.	• May be requested through the use of the "Request for Corps JD" included with RGL 16-01 as Appendix 1. Even if the JD requestor or Corps district does not use the "Request for Corps JD", the same information and signature provided in the "Request for Corps JD" should be submitted to the Corps district with each JD request.

OTHER OPTIONS TO BE CONSIDERED

NO PERMIT REQUIRED	OTHER CIRCUMSTANCES
• For situations where the proposed activity is not a regulated activity or an activity is exempt under Section 404(f) of the CWA and is not recaptured, preparation of a "no permit required" letter may be appropriate, and no JD is required, so long as that letter makes clear that it is not addressing geographic jurisdiction.	• The Corps generally does not issue a JD of any type where no JD has been requested and there are certain circumstances where a JD would not be necessary (such as authorizations by non-reporting nationwide general permits). In some circumstances, including where the Corps verifies general permits or issues letters of permission and/or standard permits, jurisdictional questions may not arise.

Appendix 1 - REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: District Name Here

- I am requesting a JD on property located at: _____
  (Street Address)
  City/Township/Parish: _____ County: _____ State: _____
  Acreage of Parcel/Review Area for JD: _____
  Section: _____ Township: _____ Range: _____
  Latitude (decimal degrees):_____ Longitude (decimal degrees): _____
  (For linear projects, please include the center point of the proposed alignment.)
- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.
- ___ I currently own this property. ___ I plan to purchase this property.
  ___ I am an agent/consultant acting on behalf of the requestor.
  ___ Other (please explain): _____.
- Reason for request: (check as many as applicable)
  ___ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
  ___ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
  ___ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
  ___ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
  ___ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
  ___ A Corps JD is required in order to obtain my local/state authorization.
  ___ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
  ___ I believe that the site may be comprised entirely of dry land.
  ___ Other: _____
- Type of determination being requested:
  ___ I am requesting an approved JD.
  ___ I am requesting a preliminary JD.
  ___ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
  ___ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

*Signature: _____ Date: _____

- Typed or printed name: _____
  Company name: _____
  Address: _____
  _____
  Daytime phone no.: _____
  Email address: _____

***Authorities:** Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.
Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.
Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.
Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

Attachment B: Compensatory Wetland Mitigation Plan

Jordan Cove Energy Project
and
Pacific Connector Gas Pipeline Project

Compensatory Wetland Mitigation Plan

Document Number:

J1-000-TEC-PLN-DEA-00002-00

Prepared for

Jordan Cove LNG SM

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Houston, TX 77005

Prepared by

DAVID EVANS AND ASSOCIATES INC.

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Portland, Oregon 97201

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1. COMPENSATORY WETLAND MITIGATION PLAN OVERVIEW

1.1 INTRODUCTION

Jordan Cove Energy Project, LP ("JCEP") is seeking authorization from the Federal Energy Regulatory Commission ("FERC" or "Commission") under Section 3 of the Natural Gas Act ("NGA") to site, construct, and operate a natural gas liquefaction and liquefied natural gas ("LNG") export facility ("LNG Terminal"), located on the bay side of the North Spit of Coos Bay, Oregon. JCEP will design the LNG Terminal to receive a maximum of 1,200,000 dekatherms per day ("Dth/d") of natural gas and produce a maximum of 7.8 million metric ton per annum ("mtpa") of LNG for export. The LNG Terminal will turn natural gas into its liquid form via cooling to about -260o Fahrenheit ("F"), and in doing so it will reduce in volume to approximately 1/600th of its original volume, making it easier and more efficient to transport.

In order to supply the LNG Terminal with natural gas, Pacific Connector Gas Pipeline, LP ("PCGP") is proposing, under a separate Section 7c NGA authorization, to contemporaneously construct and operate a new, approximately 229-mile-long, 36-inch-diameter natural gas transmission pipeline from interconnections with the existing Ruby Pipeline LLC and Gas Transmission Northwest LLC ("GTN") systems to the LNG Terminal ("Pipeline," and collectively with the LNG Terminal, the "Project").

This Compensatory Wetland Mitigation (CWM) Plan includes proposed mitigation at two sites within the Coos Bay Estuary, the Eelgrass Mitigation site and the Kentuck Project site. Each site provides for the minimum mitigation acreage/credits required to meet regulatory requirements plus additional acreage in which to conduct voluntary habitat improvements. Where appropriate, the distinction between required mitigation versus voluntary efforts is noted in this CWM Plan. The distinction is primarily with respect to the acreage of improvements to various habitat types and how much is required versus how much is voluntary.

The proposed LNG Terminal will result in unavoidable, permanent impacts to freshwater wetlands and estuarine habitats (collectively referred to as wetlands in this document except where there is a need to distinguish the difference) within the intertidal and shallow subtidal zone of Coos Bay, as provided below in Table 1. These resources provide important ecological functions to the greater Coos Bay ecosystem, and are regulated by state and federal agencies. Note that the Oregon Department of State Lands ("DSL") treats temporary impacts lasting more than two-years (long duration) as a permanent impact; whereas, the U.S. Army Corps of Engineers ("USACE") does not. For consistency sake between the two agencies, this CWM Plan only covers actual permanent impacts. All temporary impacts, short and long duration, will be addressed in a separate site restoration plan.

The proposed Pipeline will result in permanent impacts to wetlands in the form of permanently converting forested and scrub-shrub wetlands to emergent wetlands as a result of temporary disturbance activities involved with pipe installation. Conversion from a forested to an emergent wetland condition is viewed as a permanent wetland impact by the USACE and DSL due to an overall loss of wetland functions (Oregon Revised Statutes [ORS] 141-085-0680).

The Pipeline investigated whether credits could be obtained from a mitigation bank; however mitigation banks with available credits and service areas that overlap with the Pipeline are not available. Pipeline impacts to wetlands will consist of several relatively small, individual impacts spread over a large geographic area, and therefore it was deemed impracticable to conduct wetland mitigation at multiple sites in the various watersheds the Pipeline crosses. Instead, wetland mitigation for the Pipeline emphasized consolidating mitigation in a single location that would have a high likelihood of success. Therefore, Pipeline mitigation is being incorporated into the same location as much of the LNG Terminal wetland mitigation, which will occur at the Kentuck Project site in Coos Bay, Oregon.

This Compensatory Wetland Mitigation ("CWM") Plan specifically covers compensatory mitigation for permanent impacts to freshwater wetlands and estuarine resources proposed within the Project sites (Table 1 and Appendix A, Figures 1A and 1B; also see Appendix B for a detailed breakdown of Pipeline permanent impacts by watershed). As previously noted short and long duration temporary impacts are addressed in a separate site restoration plan. Development features that result in freshwater wetland and estuarine impacts and that are covered in this CWM Plan include:

- LNG Terminal: Ingram Yard
- LNG Terminal: Slip and access channel
- LNG Terminal: Material Offloading Facility ("MOF")
- LNG Terminal: South Dunes site
- LNG Terminal: Access and Utility Corridor
- LNG Terminal: Trans Pacific Parkway/U.S. Highway 101 ("US-101") Intersection Widening
- LNG Terminal: Incidental impacts associated with construction of the Kentuck Project mitigation site
- Pipeline: Areas of forested and scrub-shrub wetland converted to emergent wetland

Table 1. Summary of Permanent Freshwater Wetland and Estuarine Impacts Being Mitigated

Habitat Category	Cowardin Code*	Project Habitat Description	Permanent Impact (Acres)
LNG Terminal			
Freshwater Wetland	PFO	Forested wetland	0.26
	PSS	Scrub-shrub wetland	0.01
	PEM	Emergent wetland	1.15
	PAB	Emergent wetland and water	0.48
Estuarine	E2USN	Intertidal sand/mudflat	11.76
	E1UB	Shallow subtidal habitat (i.e. unvegetated areas from 0 feet to -15 feet Mean Lower Low Water ("MLLW") datum)	4.1
	E2EM	Saltmarsh	0.06

Habitat Category	Cowardin Code*	Project Habitat Description	Permanent Impact (Acres)
LNG Terminal			
	E2AB	Eelgrass	2.01
	E2RS	Riprap road embankment below Highest Measured Tide ("HMT")	0.51
		Total all LNG Terminal	**20.34**
Pipeline**			
Freshwater Wetland	PFO, PSS	Forested and scrub-shrub wetland converted to emergent wetland	0.83
		Total all Pipeline	**0.83**
Incidential Impacts at Kentuck Site			
Freshwater Wetland	PFO	Forested wetland	0.85
	PEM	Emergent wetland	4.55
Estuarine	E2RS	Riprap road embankment below HMT	0.07
		Total all incidental	**5.47**
		Total all impacts being mitigated	**26.64**

* Cowardin classes: E2AB = estuarine, intertidal, aquatic bed; E2USN = estuarine, intertidal, unconsolidated shore, regularly flooded (i.e., mudflat); E1UB = estuarine, subtidal, uncosolidated bottom; E2EM = estuarine, intertidal, emergent; E2RS = estuarine, intertidal, rocky shore; PFO = palustrine forested; PSS = palustrine scrub-shrub; PEM = palustrine emergent; and PAB = palustrine aquatic bed.

** A detailed breakdown of permanent wetland impacts related to the Pipeline is provided in Appendices A (map) and B (table).

As shown in Table 1, a total of 26.64 acres of impacts will require mitigation. 25.81 acres of these impacts are attributable to the LNG Terminal, which includes the LNG Terminal development impacts (20.34 acres) plus the incidental impacts associated with construction of the Kentuck Project mitigation site (5.47 acres). 0.83 acre of impacts are attributable to the Pipeline. Mitigation of permanent impacts to wetlands for the LNG Terminal will occur at two sites: the Eelgrass Mitigation site and the Kentuck Project site. Mitigation for the Pipeline will occur only at the Kentuck Project site.

The Eelgrass Mitigation site (9.34 acres) consists of a locally high area in the Coos Bay estuary, southeast of the Southwest Oregon Regional Airport ("SORA"), which is bordered by eelgrass. Site elevations are currently too high to support eelgrass; mitigation activities will include lowering the elevations to match those of surrounding eelgrass beds and planting the site with eelgrass.

The Kentuck Project includes two main components totaling approximately 100 acres adjacent to Kentuck Slough and Kentuck Creek. Kentuck Creek flows to Kentuck Slough. In this CWM Plan Kentuck Creek is used to refer to the portion of the drainage generally above the historic head of tide, while Kentuck Slough is used to refer to the portion of the drainage generally below the historic head of

tide. The first Kentuck Project component (91.44 acres), which includes the majority of the former Kentuck Golf Course, consists of diked (i.e., levee construction) historical tide lands that will be reconnected to the estuary and result in a combination of tide channels, mudflats, salt marsh, and fringing freshwater wetland communities. The second component (9.12 acres) is located at the far northeast end of the former golf course and will feature a freshwater floodplain reconnection to Kentuck Creek. Construction of the Kentuck Project will entail roughly 5.47 acres of permanent impacts to wetlands, with mitigation for these impacts incorporated into this plan. These are referred to as incidental impacts in this plan.

In Oregon, it is a longstanding and common practice for the USACE regulatory program to accept the State's wetland mitigation ratios when considering CWM Plans. Therefore, Oregon DSL wetland mitigation ratios have been used to determine mitigation acreages presented in this plan. DSL mitigation ratios are: 1 acre of restored wetland for each 1 acre of impacted wetland; 1.5 acres of created wetland for each 1 acre of impacted wetland; and 3 acres of enhanced wetland for each 1 acre of impacted wetland.

Mitigation at the Kentuck Project site will be achieved through enhancement activities (i.e. converting disturbed freshwater wetland back to historic estuarine habitats), and thus calculated using a 3:1 ratio. However, some activities may result in actual restoration; that is, some historical wetlands that are currently upland may be restored to wetland. For mitigation credit accounting purposes, all potential restoration will be considered contingency, because all of the mitigation needs can very likely be met through the proposed enhancement areas.

For purposes of consistency, this proposed CWM Plan has been prepared in accordance with the Oregon Administrative Rules (OAR) of the Oregon DSL (OAR 141-085-0680). However, the plan is also fully supportive of federal regulatory permitting requirements.

1.2 ECOLOGICAL GOALS AND OBJECTIVES

The goals and objectives of this CWM Plan seek to offset the loss of acreage and functions provided by the wetland resources that would be impacted by the Project. Specific goals and objectives for each proposed mitigation area are provided below, with additional detail provided in Section 7.1, Performance Standards. It should be noted that acreages proposed below are primarily the minimums based on the standard DSL 3:1 enhancement ratios, and that considerable additional voluntary habitat improvement acreage is planned for beyond these minimums. In some instances voluntary efforts are included in the goals and objectives discussion to help clarify the distinction between required mitigation versus the voluntary efforts at each site.

1.2.1 Eelgrass Mitigation Site

The Eelgrass Mitigation site is intended to offset impacts to eelgrass habitat resulting from the LNG Terminal. The Pipeline does not impact eelgrass habitat.

Mitigation Goal 1: Enhance a minimum of 6.03 acres of existing intertidal habitat to support a minimum of 2.01 acres of medium density or higher eelgrass beds and 4.02 acres of low density eelgrass beds.

Density classes are defined as follows: less than 10 percent cover equals an absence of eelgrass bed; low density equals approximately 10 percent to 39 percent cover; medium density equals approximately 40 percent to 79 percent cover; and high density equals approximately 80 percent cover or greater.

Note that this effort will occur over approximately 9.34 acres. This total area includes approximately 1.68 acres of low density eelgrass beds that would be temporarily disturbed to achieve design elevations, plus approximately 1.63 acres of voluntary habitat improvement area above the minimum requirements.

To achieve this goal, the following objectives will be met:

- **Objective 1.1:** Grade (i.e., excavate) an area of approximately 6.03 acres minimum to provide suitable elevations for the establishment of eelgrass. Suitable elevations will be based on field observations of existing nearby robust eelgrass beds, which typically range between approximately 3 feet vertically either side of Mean Lower Low Water ("MLLW").
- **Objective 1.2:** Transplant eelgrass plugs from donor sites to establish a minimum of 2.01 acres of medium density or higher eelgrass beds and 4.02 acres of low density eelgrass beds within the 6.03-acre recontoured area described under Objective 1.1. Additionally, transplant eelgrass plugs into the approximately 1.68-acre temporary impact area to maintain low density eelgrass beds. Within the same overall site, an additional 1.63-acre voluntary habitat improvement area may also receive eelgrass transplants but would not be a part of required mitigation performance standards.

1.2.2 Kentuck Project Site – Tidal Reconnection Area (LNG Terminal)

The LNG Terminal's additional mitigation needs will be provided for in the Tidal Reconnection Area.

Mitigation Goal 2: Reestablish tidal influence to a minimum of approximately 71.40 acres of historical intertidal habitats within the former golf course site.

Approximately 91 acres of construction will be undertaken to achieve this goal, including approximately 20 acres of voluntary habitat improvements above the minimum requirements. Additionally, JCEP anticipates providing substantially more vegetated habitat (e.g., salt marsh) than the minimum required because of salt marsh's higher productivity and historical loss within the watershed relative to mudflat.

To achieve this goal, the following objectives will be met:

- **Objective 2.1:** Construct a new bridge in East Bay Drive to allow tidal exchange between Kentuck Inlet and the Kentuck Project site.
- **Objective 2.2:** Remove or plug the existing culverts and tidegate located near the intersection of East Bay Drive and Golf Course Lane. (method to be determined during final design, including input from County roadway department)
- **Objective 2.3**: Augment approximately 6,000 linear feet of levee along the Kentuck Project site and Kentuck Slough.
- **Objective 2.4**: Install a muted tidal regulator ("MTR") in the augmented levee to provide fish passage and hydraulic exchange between the former golf course and Kentuck Slough.
- **Objective 2.5:** Restore tidal connection to the former irrigation pond creek system by constructing a fish-passable culvert or structure through Golf Course Lane.
- **Objective 2.6:** Construct and/or enhance approximately 11,500 linear feet of tide channels.
- **Objective 2.7:** Install fish habitat features. At a minimum, the following will be installed:
    - 4 complex wood structures (also known as fish houses)
    - 11 simple wood structures (for example, 1 to 3 pieces of large wood per structure)
    - 2 habitat pools
- **Objective 2.8:** Establish a minimum of 71.40 acres of a combination of estuarine and fringing freshwater wetland habitats, of which a minimum of 5.88 acres will be vegetated habitats (i.e., salt marsh, palustrine forested, scrub-shrub, and emergent wetland).
- **Objective 2.9**: Install a publicly accessible trail, to be located along the top of the augmented levee, and a boardwalk that will cross the northeast end of the site and follow near the toe of slope of the adjacent hillside.

1.2.3 Kentuck Project Site – Freshwater Floodplain Reconnection Area (Pipeline)

The Pipeline's mitigation needs will be provided for in the Freshwater Floodplain Reconnection Area.

Mitigation Goal 3: Reestablish floodplain connection to a minimum of approximately 2.49 acres of historical floodplain adjacent to Kentuck Creek, and establish a mix of primarily forested and scrub-shrub wetland habitats. Approximately 9.12 acres of construction will be undertaken to achieve this goal, including approximately 6.63 acres of voluntary habitat improvements above the minimum requirements.

To achieve this goal, the following objectives will be met:

- **Objective 3.1:** Remove approximately 1,560 linear feet of existing levee between Kentuck Creek and the Kentuck Project site.
- **Objective 3.2:** Regrade the site to provide wetland hydrology and micro-topography to support a variety of plant species, and to the extent practical, provide access and refugia to fish during high flow events.

- **Objective 3.3**: Install a minimum of four simple log structures (for example, one to three pieces of large wood per structure) in order to provide habitat structural components. These log structures may be incorporated into bioengineered scour protection if deemed necessary during final design, or may simply serve as habitat features.
- **Objective 3.4:** Establish a minimum of 2.49 acres of mixed forest and scrub-shrub wetland plant communities, which may include patches of emergent wetland community, to foster overall habitat diversity.

1.3 OVERVIEW OF CWM CONCEPT AND FUNCTIONS AND VALUES REPLACEMENT

CWM activities will occur at two separate sites—the Eelgrass Mitigation site and the Kentuck Project site—with each site addressing a different need (see Appendix A, Figure 1A). Location information is provided in Section 2, CWM Site Information. Lost functions and values at the existing wetland sites will be replaced by conducting mitigation in suitable locations within the Coos Bay estuary that will result in self-sustaining, complex habitats connected to adjacent ecosystems. Additional discussion of functional replacement is provided in Section 5, Functions and Values Assessment. An overview of the CWM concept for both sites is provided below.

1.3.1 Eelgrass Mitigation Site

To mitigate for permanent impacts to approximately 2.01 acres of eelgrass, JCEP proposes to enhance a minimum of approximately 6.03 acres of existing intertidal habitat to support a minimum of 2.01 acres of medium density or higher eelgrass beds and 4.02 acres of low density eelgrass beds due south of the west end of the SORA runway. This effort is considered to be enhancement because it improves the functionality of existing estuarine habitat. As previously noted, enhancement projects in Oregon require a 3 to 1 ratio of mitigation to impact acreage. As noted in Section 1.2.1, the total size of the site is designed to be 9.34 acres, which in addition to the acreage just described also includes approximately 1.68 acres of low density eelgrass beds that may be temporarily disturbed to achieve design elevations, plus approximately 1.63 acres of voluntary habitat improvement area above the minimum requirements. Conceptual design plans for the Eelgrass Mitigation site are provided in Appendix A, Figures 2 and 3.Based on documented evidence of eelgrass presence in Coos Bay, it is known that eelgrass tends to flourish between approximately -1.0 meter (“m”) to +1.0 m MLLW elevation (Thom et al. 2003). Hydrographic survey work conducted by David Evans and Associates, Inc. (“DEA”) in Coos Bay in August 2007, January 2014, August 2014, and September 2017 supports this observation.

The proposed approach is to excavate a locally high area surrounded by eelgrass down to approximately -1.0 m to +1.0 m MLLW. The site will be left to stabilize for at least one winter storm cycle, and then be planted with donor stock in subsequent years. Excavation would occur within the ODFW in-water work window (October 1 through February 15), which is after the preferred time for transplanting eelgrass (i.e., the time of peek biomass, which occurs during late summer), so it is not desirable to plant immediately following excavation. This same approach was used in the eelgrass mitigation efforts associated with the SORA runway extension project (McCollough pers. comm. 2006), and was considered successful (Rumrill pers. comm. 2006 and DSL 1997).

Eelgrass donor stock may be obtained from a combination of potential sources including: the eelgrass impact site, healthy unmanaged beds within the bay, and/or eelgrass beds found within managed oyster farming areas in the bay. Appendix A, Figure 3, shows the conceptual planting layout, where planting beds would be spread across the mitigation site, with plants then allowed to spread between the individual plantings beds. The acreage of all planting beds would at a minimum equal the acreage of the proposed 2.01 acres of medium density or higher eelgrass beds. Plant spacing within each bed is currently set at 3 feet on center spacing, which is a typical mid-range for spacing used in eelgrass mitigation sites (Fonseca et al. 1998). However, this spacing will be reviewed as part of final design, as tighter spacing is sometimes warranted in areas with higher current flow or wave action (Fonseca et. al. 1998).

The proposed eelgrass mitigation work will offset permanently impacted eelgrass acreage and functions and values. A discussion of functions and values replacement is provided in Section 1.5 and Section 5.

1.3.2 Kentuck Project Site

Historically, the Kentuck Project site provided estuarine habitats (i.e., salt marsh, mudflats, tide channels, and fringing freshwater wetlands) that were hydrologically connected to the Kentuck Slough and Coos Bay estuary systems. However, circa the 1940s, the Kentuck Project site was diked and converted to agricultural uses. Eventually the site was converted into an 18-hole golf course before reverting back to agricultural use (i.e., pasture) in 2009.

The mitigation concept involves conducting enhancement activities to return the Kentuck Project site back to its natural potential, given existing on-site and off-site constraints that include local transportation systems, access to and protection of adjacent private property, and drainage district requirements. Conceptual design plans for the Kentuck Project site are provided in Appendix A, Figures 4A through 11C.

Mitigation activities will establish a combination of native estuarine habitats (i.e., salt marsh, tidal sand/mudflats, and tide channels) and freshwater wetland habitat types (i.e., palustrine forested, scrub-shrub, and emergent) that will interact to provide a holistic coastal ecosystem. Mitigation activities will also result in an uplift in ecosystem functions and are expected to be particularly beneficial to coho salmon recovery. Socio-cultural benefits (e.g., public use trail and tribal ethnobotanical interests) will also be incorporated into the site to the extent feasible.

1.3.3 Kentuck Tidal Reconnection Area

Tidal reconnection will be achieved by constructing a new East Bay Drive bridge to allow tidal exchange between Kentuck Inlet and the mitigation site. A new tidegate array, including an MTR gate, will be placed towards the upstream end of the Kentuck Project site to allow for fish passage from the site to Kentuck Slough and to allow freshwater flows from the slough to enter the site, thus providing an important salinity mixing zone for outgoing smolts. Kentuck Slough would be substantially rerouted to flow through the new tidegate array and through the new bridge into Kentuck Inlet. The existing levee between the golf course area and Kentuck Slough will be repaired and/or augmented to protect upstream properties from tidal influence.

The existing ditched main channel through the Kentuck Project site runs for approximately 6,000 feet before draining via a tidegated culvert under a small levee on the east side of East Bay Drive. Water then flows under East Bay Drive via a roughly 10-foot-diameter fish-passable culvert. The existing main channel through the site will be enhanced and rerouted to connect the tidegate array and bridge. Secondary tide channels will be constructed to connect with the main channel running through the site. Existing tributaries that drain into the Kentuck Project site will also connect with the enhanced main channel. The existing approximately 8-foot-diameter culvert under East Bay Drive will be removed or plugged, and the small levee with the tidegated culvert just east of the road will be removed. A new culvert, which will be installed through the existing earthen dam associated with the former golf course irrigation pond, will restore tidal connection and fish access to the drainage upstream of the dam. Instream habitat features, such as large wood and habitat pools, will be included to support salmonids (Appendix A, Figures 6A, 6B, and 10A–10C).

East Bay Drive and Golf Course Lane will also be improved as part of the mitigation project construction. East Bay Drive will be raised approximately 3 feet at its lowest point south of the existing Kentuck Slough Bridge. Approximately 1,900 total linear feet of the golf course access road will be raised approximately 3 to 8 feet, so that the road will be above projected high tide elevations, including storm surge and projected future sea level rise.

Survey information confirms that elevations within the Kentuck Project site are appropriate for establishing mudflat habitat. The primary salt marsh surface at the nearby reference site (immediately downstream of East Bay Road) occurs between approximately elevations 5.5 feet and 8.5 feet North American Vertical Datum of 1988 (“NAVD 88”). However, typical elevations within the golf course range between 2.0 and 4.0 feet NAVD 88. These lower elevations in the former golf course preclude the establishment of vegetation, and therefore mudflat would be the predominant habitat type without intervention. As a result, grades will be increased where practicable to foster additional salt marsh establishment along the edges of the mitigation site. Current design includes increasing the elevations of parts of the site to better support establishment of salt marsh and fringe freshwater wetlands; however, conducting this work is dependent on having suitable material to import to raise grades. Because of this, mitigation goals and objectives are focused on providing the minimum amount of salt marsh and freshwater wetlands required to offset impacts to vegetated wetland and estuarine habitat types (excluding

eelgrass), but with the understanding that the establishment of additional salt marsh and freshwater wetlands and a subsequent decrease in bare mudflat is a desirable outcome.

Proposed design elevations should be conducive to the establishment of salt marsh communities throughout much of the site (see Appendix A, Figures 5A–5C, 6A, 6B, and 7). Freshwater wetlands should form along the site margins, particularly where seeps and freshwater tributaries flow from the hillside into the site. Salt marsh vegetation is anticipated to establish by natural recruitment (i.e., self-seeding by seed brought in from adjacent marsh areas by the tides). Experience of the South Slough National Estuarine Research Reserve ("SSNER") suggests that natural recruitment is an appropriate means of establishing salt marsh vegetation at mitigation and restoration sites, and that planting should not be needed (Cornu pers. comm. 2014). Craig Cornu of SSNER also noted that non-native annual salt marsh species, such as brass buttons (*Cotula coronopifolia*), often colonize a newly established salt marsh site during the first few years, but then typically begin to be outcompeted within the third year after establishment of the site. Natural recruitment may be utilized as the primary method for establishing salt marsh habitat, with supplemental plantings provided along the upper margins of salt marsh. However, more intensive seeding may be applied if it is determined to be of benefit to either salt marsh establishment or erosion control needs. Native freshwater wetland plant communities will be planted with species common to Oregon coastal palustrine forested and scrub-shrub wetlands. For example, fringing willow communities are highly beneficial in supporting food sources (e.g., macroinvertebrates) for rearing juvenile salmonids, and therefore native willows will be an important component of the plant palette. Areas anticipated to be in salt marsh-to-freshwater wetland transition zones/elevations will also be planted with a mix of species that are adapted to a variety of salinity conditions, such as meadow barley (*Hordeum brachyantherum*), tufted hair-grass (*Deschampsia caespitosa*), and Hooker's willow (*Salix hookeriana*).

To achieve the proposed design elevations, dredge material from other parts of the LNG Terminal will be beneficially utilized. Dredged materials will be transported by barge to the edge of the Federal Navigation Channel near Kentuck Inlet, where they will then be remobilized and pumped via pipeline into the Kentuck Project site. Materials will be allowed to dewater, and rough grading will occur. It will be desirable to allow rough-graded material to sit for a minimum of six months (subject to final geotechnical recommendations) before final grading to allow for material settling and compression of the underlying soils. This process will reduce the amount of settling that is otherwise anticipated to occur after the reintroduction of tidal influence.

The Kentuck Slough levee will be rebuilt because of the poor condition of the existing levee (Appendix A, Figures 5A, 5B, 8A, 8B, and 9A). The existing slough-side face of the levee will remain intact at the direction of the Kentuck Drainage District, but the remainder of the levee cross section will be rebuilt. The rebuilt levee could include a concrete-treated core, which will provide the following benefits: (1) it will limit saltwater intrusion from the Kentuck Project into Kentuck Slough and adjacent properties; (2) it will increase the longevity of the levee by limiting impacts from burrowing animals; and (3) it will provide structural support to allow maintenance vehicles to run across the top of the levee. A rocked or paved maintenance access road will run across the top of the levee and also serve as part of a proposed

public use trail that would follow the perimeter of the Kentuck Project site. In addition to the proposed levee trail section, the trail would consist of both boardwalk and soft path (i.e., surfaced with wood chips or gravel) sections. The trail has been sited to allow the public to experience the various habitats proposed for the Kentuck Project, while minimizing impacts to the interior, highest functioning core of the site.

In addition to levee and tidegate construction, the proposed mitigation will remove, to the greatest extent practicable, existing golf course improvements in the mitigation site, such as fencing, ditches, foot bridges, and culverts.

Mitigation construction activities (e.g., levee repair/augmentation, new levee construction, road improvements, septic drain field protection) will result in incidental permanent wetland impacts within the mitigation site (Appendix A, Figures 8A and 8B). This activities and associated impacts are needed to successfully construct the Kentuck Project, while protecting adjacent properties from the risk of salt water intrusion and to continue to provide access to properties post construction. For example, Golf Course Lane elevations will need to be raised above high tide plus storm surge and future projected sea level rise. This CWM Plan accounts for these impacts and provides the mitigation required to offset these unavoidable impacts. Bioengineering approaches will be reviewed during final design to assess opportunities to provide additional habitat benefits along the edges of the above-mentioned structural components of the project (concept example provided in Appendix A, Figure 10D).

The proposed mitigation at the Kentuck Tidal Reconnection Area will offset permanently impacted estuarine and freshwater wetland acreage and functions and values. A discussion of functions and values replacement is provided in Section 1.5 and Section 5.

1.3.4 Kentuck Freshwater Floodplain Reconnection Area

The northeast end of the Kentuck Project site will be reconnected to Kentuck Creek, outside of the previously described tidal reconnection area, and therefore will provide restored freshwater wetland floodplain habitat. This area provides mitigation for Pipeline impacts, which consist of conversion of palustrine forested and scrub-shrub wetlands to emergent wetlands. Therefore, forested and scrub-shrub wetlands are the dominant habitat types proposed for this area.

The existing levee that separates Kentuck Creek from the Kentuck Project site will be removed in this area, allowing flood flows to enter the floodplain bench. The improved levee, which is described above, will be relocated at this end of the Kentuck Project to provide the separation between the tidal reconnection and freshwater floodplain reconnection components of the Kentuck Project site. Minor grading within the freshwater floodplain reconnection area will occur in order to provide micro-topographic relief, which should allow for establishment of diverse plant communities and provide fish refugia habitat during periods of high water. Similar to the tidal portion of the Kentuck Project described above, because willows are highly supportive of rearing salmonids, they will be an important component of the plant communities.

The proposed mitigation at the Kentuck Freshwater Floodplain Reconnection Area will offset permanently impacted estuarine and freshwater wetland acreage and functions and values. A discussion of functions and values replacement is provided in Section 1.5 and Section 5.

1.4 SUMMARY OF IMPACTS AND CWM ACREAGE/CREDITS

A summary of freshwater wetland and estuarine resource impacts that will require mitigation is provided in Table 2. As previously noted short and long duration temporary impacts are addressed in a separate site restoration plan.

Table 3 provides a summary of mitigation acreage and credits by the type of mitigation proposed (i.e., enhancement or restoration). Table 4 provides a summary of mitigation acreage by habitat type, Cowardin class, and hydrogeomorphic ("HGM") class. The mitigation sites are larger than the actual area needed for mitigation. Therefore, work in the additional acreage at these sites is considered to be voluntary habitat improvements above and beyond mitigation requirements.

Table 3 and Table 4 provide acreages for the entirety of the mitigation sites including areas of voluntary habitat improvements, whereas Section 1.2, Ecological Goals and Objectives, provides acreages specific to the mitigation requirements based on actual impacts. The habitat acreages in Table 4 should be considered rough estimates based on planting plan designs; however, final habitat acreage is likely to vary as the mitigation sites mature. This is particularly the case for vegetated communities at the Kentuck Tidal Reconnection Area, where the boundaries between communities are highly dependent on the interplay of high salinity water from the bay and freshwater inputs from inflowing creeks, seeps, and groundwater. The grading and planting plans for the Kentuck Tidal Reconnection Area have been designed so that proposed freshwater wetland habitat types would trend towards estuarine (i.e., salt marsh) habitats rather than upland habitats, should the interplay of fresh and saline waters not occur as anticipated.

Table 2. Project Impacts Requiring Compensatory Mitigation

Wetland and Estuarine Resources	Cowardin Class Type*	Hydrogeomorphic (HGM) Class	Permanent Impacts (Acres)
Eelgrass at Slip and Access Channel	E1/E2AB	Estuarine	2.01
Intertidal Sand/Mudflat at Slip and Access Channel	E2US	Estuarine	10.12
Shallow Subtidal at Slip and Access Channel	E1UB	Estuarine	4.03
Salt Marsh at Slip and Access Channel	E2EM	Estuarine	0.06
Intertidal Sand/Mudflat at MOF	E2US	Estuarine	1.64
Shallow Subtidal at MOF	E1UB	Estuarine	0.07
2013-6	PEM	Depression	0.69

Wetland and Estuarine Resources	Cowardin Class Type*	Hydrogeomorphic (HGM) Class	Permanent Impacts (Acres)
Wetland C	PFO	Depression	0.26
Wetland E	PAB	Depression	0.48
Wetland H (East)	PEM	Slope/flats	0.09
Wetland H (West)	PEM	Slope/flats	0.01
Wetland I (North)	PEM	Slope/flats	0.27
Wetland I (South)	PSS	Slope/flats	0.01
Wetland J	PEM	Slope/flats	0.07
Wetland N	PEM	Slope/flats	0.02
Intertidal Riprap Embankment at Trans Pacific Parkway/US-101	E2RS	Estuarine	0.51
Kentuck-Wetland A1	PEM	Slope/flats	4.30
Kentuck-Wetland A2**	PEM	Slope/flats	0.07
Kentuck-Wetland A3	PEM	Slope/flats	0.14
Kentuck-Wetland A4	PFO	Slope/flats	0.85
Kentuck-Wetland A7	PEM	Slope/flats	0.04
Kentuck-Intertidal Riprap Embankment at East Bay Drive	E2RS	Estuarine	0.07
Pipeline Impacts (see Appendix B for breakdown)	PFO/PSS	various	0.83
		Total	**26.64**

* Cowardin classes: E1/E2AB = estuarine, subtidal/intertidal, aquatic bed; E2USN = estuarine, intertidal, unconsolidated shore, regularly flooded (i.e., mudflat); E1UB = estuarine, subtidal, uncosolidated bottom; E2EM = estuarine, intertidal, emergent; E2RS = estuarine, intertidal, rocky shore; PFO = palustrine forested; PSS = palustrine scrub-shrub; PEM = palustrine emergent; and PAB = palustrine aquatic bed.

** These are impacts associated with proposed boardwalks, a small portion of which extends into Wetland A1, but are included in the acreage calculation for Wetland A2 for ease of tracking.

Table 3. Mitigation and Voluntary Habitat Improvements Summary by Mitigation Type, Acres, Ratios, and Credits*

Mitigation Site	Mitigation Type	Total Mitigation Acres**, ***	Mitigation Ratio	Total Credits Available	Credits Needed (i.e., impacts)	Voluntary Habitat Improvement Credits
Eelgrass	Enhancement	**7.66**	3:1	**2.55**	**2.01**	**0.54**
Kentuck –Tidal Reconnection Area						
Kentuck Site – Tidal Reconnection Area	Enhancement	87.54	3:1	29.18	--	--
	Restoration	3.94	1:1	3.94	--	--
	Subtotal	**91.48**		**33.12**	**23.8**	**9.32**
Kentuck –Freshwater Floodplain Reconnection Area						
Kentuck Site – Freshwater Floodplain Reconnection Area	Enhancement	7.50	3:1	2.50	--	--
	Restoration	1.62	1:1	1.62	--	--
	Subtotal	**9.12**		**4.12**	**0.83**	**3.29**
	Kentuck Subtotal	**100.60**		**37.24**	**24.63**	**12.61**
	Total All Sites	**108.26**		**39.79**	**26.64**	**13.15**

* Voluntary Habitat Improvement credits are based on the total mitigation credits for a given area minus proposed impacts. Pipeline impacts and associated mitigation have been asigned to the Kentuck – Freshwater Floodplain Reconnection Area, and non-eelgrass LNG Terminal impacts and associated mitigation have been assigned to the Kentuck –Tidal Reconnection Area.

** The mitigation sites are larger than the actual area needed for mitigation, which will result in additional habitat improvements referred to as “voluntary habitat improvements” in this CWM Plan. This table provides acreage and credits for the entirety of the proposed mitigation sites including the voluntary habitat improvements, whereas Section 1.2, Ecological Goals and Objectives, provides acreages specific to mitigation requirements based on permanent impacts.
*** Only includes area of potential mitigation credits (i.e. excludes areas of potential incidental impacts at mitigation sites.)

Table 4. Mitigation and Voluntary Habitat Improvements Summary by Habitat Type, Cowardin Class, and HGM Class

Mitigation Site	Habitat Type*	Cowardin Class**	HGM Class	Acres****
Eelgrass	Eelgrass	E1/2AB	Estuarine	7.66
Kentuck Project – Tidal Reconnection Area	Tidal mudflat	E2USN	Estuarine	32.35
	Salt marsh	E2EM	Estuarine	46.92
	Willow Scrub-Shrub Wetland ***	E2FO	Estuarine	8.73
	Forested Wetland ***	E2FO	Estuarine	3.44
			Subtotal	**91.44**
Kentuck Project – Freshwater Floodplain Reconnection Area	Emergent Wetland	PEM	Riverine	1.24
	Willow Scrub-Shrub Wetland	PSS	Riverine	4.72
	Forested Wetland	PFO	Riverine	3.16
			Subtotal	**9.12**
Total All Sites				**100.56**

* Habitat type refers to the estimated plant communities shown on conceptual design sheets provided in Appendix A.
** Cowardin classes: E1/E2AB = estuarine, subtidal/intertidal, aquatic bed; E2USN = estuarine, intertidal, unconsolidated shore, regularly flooded (i.e., mudflat); E2EM = estuarine, intertidal, emergent; PFO = palustrine forested; PSS = palustrine scrub-shrub; and PEM = palustrine emergent.

*** Cowardin and HGM classes for freshwater wetland communities at the Kentuck Project – Tidal Reconnection Area are considered to be estuarine, because they are located below Highest Measured Tide and are likely to experience some tidal influence at the groundwater/tidal prism interface. Acreage of these habitat types is based on proposed habitat communities; however, the actual areas occupied by these communities as the site matures are likely to vary based on the interplay between salt water from the bay and freshwater inputs from inflowing creeks, seeps, and groundwater.

**** Acreage is for entire area of mitigation site that could provide mitigation credits (i.e., required mitigation plus voluntary habitat improvements). See Section 1.2, Ecological Goals and Objectives for acreages specific to minimum requirements. Areas of potential incidental impacts at mitigation sites not included.

1.5 SUMMARY OF NET GAINS AND LOSSES OF FUNCTIONS AND VALUES

Proposed mitigation will result in a net increase in acreage of impacted habitats and, because mitigation habitats will function in a manner equivalent to or better than those habitats being impacted, it is anticipated that there would be a net gain in overall functions and values. Lost estuarine functions will be offset at the Kentuck Project site and the Eelgrass Mitigation site, both of which are situated in and/or will result in a considerably more complex and diverse array of habitats than at the slip impact site, thus resulting in an overall uplift in functions lost. For example, impacted shoreline habitats primarily consist of moderately productive unvegetated sand/mudflats. Impacts to these habitats will be offset at the Kentuck Project site through restoration of a substantially larger and more diverse assemblage of estuarine habitats, including salt marsh, sand/mudflats, and tide channels. This rich mosaic of estuarine habitats will clearly improve estuarine functions, including water quality, wildlife, and fish.

Impacted freshwater wetlands primarily consist of areas bordered by formerly developed industrial land. Mitigation will create freshwater fringe wetlands adjacent to the estuarine habitats to be restored at the Kentuck Project site. Habitat features will be incorporated that further support recovery of listed coho salmon. In addition, the Kentuck Project site will incorporate public access features, such as trails and tribal ethnobotanical elements (e.g., plant species of tribal importance and interpretative signage). Such community and cultural elements are currently absent at the impact locations, because the impact areas are in industrial lands.

Pipeline impacts consist of very small acreage impacts and only a partial reduction in function. These impacts will be offset at a consolidated site that will provide clear ecosystem benefits by restoring floodplain connection to Kentuck Creek, which will in turn benefit flood control, water quality, wildlife, and fish functions, including providing high flow refugia and food chain support that will directly benefit listed coho salmon.

2. CWM SITE INFORMATION

2.1 CWM SITE OWNER NAME AND CONTACT INFORMATION

The proposed Eelgrass Mitigation site is and will be owned by the State of Oregon.

The Kentuck Project site is owned by Fort Chicago LNG II U.S. LLC, a wholly-owned indirect subsidiary of Pembina Pipeline Corporation.

Project contact information is:

Attention: Rose Haddon, Director of Regulatory Affairs
Jordan Cove LNG
5615 Kirby Drive, Suite 500
Houston, Texas 77005
Phone: (713) 400-2834

2.2 LEGAL AGREEMENT FOR PROPERTY USE AND LONG-TERM PROTECTION IF SITE IS NOT APPLICANT-OWNED

2.2.1 Eelgrass Mitigation Site

Jordan Cove Energy Project, LP anticipates endowing a third-party conservation entity that will hold an easement from the State of Oregon for the mitigation site. Clauses necessary to protect the site will be written into the easement.

2.2.2 Kentuck Project

Jordan Cove Energy Project, LP is an applicant; therefore, a legal agreement for the use and long-term protection of the site is not proposed.

2.3 LOCATION INFORMATION

2.3.1 Eelgrass Mitigation Site

Impacts to eelgrass resources will be mitigated at a shallow, unvegetated intertidal island located to the southwest of the SORA runway (Tax map #25-13-08, lot # not applicable, Township 25 South, Range 13 West, Section 8). The proposed mitigation site is owned by the State of Oregon, with management authority held by DSL.

2.3.2 Kentuck Project

The Kentuck Project site is located east of North Bend, Oregon (Township 25 South, Range 12 West, Sections 6 and 7; Township 25 South, Range 13 West, Sections 1 and 12, Willamette Meridian). Tax maps and lots are: 25s12w06c lot 100, 25s13w12a lot 100, and 25s13w1d lot 400.

3. CWM SITE SELECTION AND DESIGN PRINCIPLES

3.1 REPLACEMENT

The proposed CWM will replace impacted functions and values through in-kind or like-kind mitigation, at a 3:1 ratio, thereby enhancing the same or similar types of habitats that are being impacted. Net acreage of impacted habitats will be greater after the Project and CWM than under existing conditions as a result of the standard mitigation ratios required by Oregon law.

3.2 CWM PROVIDES LOCAL REPLACEMENT FOR LOCALLY IMPORTANT FUNCTIONS AND VALUES LOST, IF APPLICABLE

CWM will take place in proximity to the proposed impact sites, thereby providing local replacement of lost functions and values. Eelgrass mitigation will take place roughly opposite the Federal Navigation Channel from the impact site. Mudflat, salt marsh, and fringing freshwater mitigation will occur within the Coos Bay estuary system, 3 to 4 miles from the impact site. As noted in Section 1, Introduction, Pipeline impacts requiring mitigation consist of very small impacts that are spread out over a very long distance, and therefore it is not practicable to provide local mitigation for each small impact. Therefore, the emphasis of mitigation planning turned to consolidating mitigation in a single location that would have a high likelihood of success (i.e., the Kentuck Project site). It is also important to note that the Pipeline impacts will result only in a partial loss of wetland functions, as opposed to a loss of acreage and all functions, because these wetlands will still remain, but with what is considered to be a lower functioning habitat type than existed before the Pipeline.

3.3 CWM IS SELF-SUSTAINING AND MINIMIZES MAINTENANCE NEEDS

Each mitigation site has been designed to be self-sustaining to the greatest extent practicable. The Eelgrass Mitigation site will not rely on water control structures or other intensively managed structures to maintain wetland hydrology. The Kentuck Project requires a new tidegate structure to protect adjacent and upstream properties. Mitigation at the former golf course is not viable without this structure.

However, the mitigation site will maintain a free and open connection to the Coos Bay estuary as a result of the installation of a bridge along East Bay Drive that will result in removal of the existing culvert and tidegate that connect the golf course to the estuary.

3.4 SITING CONSIDERATIONS FOR ECOLOGICAL SUITABILITY

3.4.1 Eelgrass Mitigation Site

The proposed Eelgrass Mitigation site was selected after a rigorous review of potential sites by DEA (DEA 2007). The review looked at eight sites throughout the bay and evaluated each site based on ecological conditions suitable for eelgrass growth. These conditions included appropriate salinity concentrations, moderate flow/circulation, appropriate depths relative to MLLW, distance from potential pollution sources, and the presence of nearby eelgrass beds. The review also assessed land availability and constructability issues.

3.4.2 Kentuck Project

The proposed Kentuck Project site was selected partly through the same investigation of eelgrass sites (DEA 2007). This site historically provided mudflat, salt marsh, tide channel, and fringing freshwater habitats. The site historically also was an important transitional rearing habitat for coho salmon, because it would have provided an important brackish water mixing zone between the inflowing freshwater of Kentuck Creek and the more saline waters of the bay. Because of subsidence related to diking and draining activities, the site can now support primarily mudflat habitats.

3.4.3 Minimizes Temporal Loss

Mitigation work will be conducted concurrently with Project construction, a period of approximately 60 months. Mitigation work will begin at the front end of the construction schedule, where feasible, in an effort to minimize temporal loss of ecological functions. However, the construction schedule will also emphasize measures that are likely to lead to the long-term success of the Project-related mitigation work For example, allowing imported dredge material to be rough graded and then to sit for a minimum of six months will allow for settling to occur before final grading, which will improve the ability to achieve the target elevations.

4. CWM EXISTING SITE CONDITIONS (BASELINE INFORMATION)

4.1 WETLAND DELINEATION OR DETERMINATION

4.1.1 Eelgrass Mitigation Site

A wetland delineation report has not been prepared for the proposed Eelgrass Mitigation site. The site consists of an unvegetated sandflat below the average high tide elevation of Coos Bay and is surrounded by deeper water areas. Eelgrass borders portions of the edge of the island where elevations drop and water circulation and other factors are conducive to eelgrass growth. The site is clearly an estuarine resource feature within DSL and USACE jurisdiction.

4.1.2 Kentuck Project

Wetland delineation reports have been prepared for the Kentuck Project site (DEA 2009 [updated via DEA 2016, DSL WD #2010-0337R, concurrence received August 18, 2016], DEA 2014 [DSL WD #2014-0350, concurrence received February 23, 2016]). The wetland delineation reports provide the following site description:

The approximately 128-acre former golf course is located adjacent to the south bank of Kentuck Slough, between River Mile 0.0 and River Mile 0.9. Prior to diking, the area consisted of mudflats, and low and high salt marsh plant communities located along a broad intertidal terrace. The property has been diked from Coos Bay and the slough, and (until very recently) has been operated as a golf course. Near the northwest corner of the property, the Kentuck Slough channel flows under East Bay Road through a bridge with a tidegate structure, where flows then enter Kentuck Inlet, an arm of the Coos Bay Estuary. The site is also hydraulically connected to Kentuck Inlet by way of a 10-foot-diameter culvert and tidegate near the southeast corner of the property under East Bay Drive.

Portions of the original channel and smaller tributary channels remain on the golf course; however, they have been notably altered, and additional drainage ditches have been added. The presence of the levee and East Bay Drive section have resulted in the conversion of the property from an estuarine (i.e., saltwater and brackish water) system to a freshwater system. Historically the site had a bi-directional hydrologic connection (i.e., tidal flow in and out) with the slough channel and Coos Bay. Currently, the site is protected from tidal inundation, and drainage only occurs in one direction.

The approximately 100-acre historical flood terrace has been delineated as an emergent wetland (palustrine emergent Cowardin class) plant community dominated by lawn grasses, with scattered native and ornamental tree plantings. Since golf course operations ceased, circa 2009, the flood terrace has reverted to wet pasture and is grazed by cattle. The areas outside of the former maintained golf course grounds consist of forested wetlands (palustrine forested Cowardin class) and upland forest. Historically, the flood terrace would have been classified as an estuarine wetland.

4.2 HYDROGEOMORPHIC ("HGM") AND COWARDIN CLASSES/SUBCLASSES AT CWM SITE

4.2.1 Eelgrass Mitigation Site

Based on the *Guidebook for HGM-based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles* (Adamus 2001), the proposed Eelgrass Mitigation site can be classified as Estuarine Fringe, Embayment (EFE). Estuarine Fringe sites include sites whose hydrodynamics are influenced mainly by the daily bi-directional movement of tides and where the deep water edge is defined by the 2-meter depth contour, as measured from mean daily low tide (Adamus 2001). The Estuarine Fringe, Embayment (EFE) subclass typically receives more of its hydrologic inputs from the ocean than from rivers and is less influenced by seasonal runoff events.

The Cowardin class of the proposed Eelgrass Mitigation site is estuarine, intertidal, unconsolidated shore, regularly flooded (E2USN).

4.2.2 Kentuck Project

The former golf course wetlands would be classified as a slope wetland under the HGM classification system, because groundwater provides the dominant source of hydrology; however, these wetlands could also be placed in the "flats" class due to the notable effect that direct precipitation can have on water levels there. Prior to diking, the golf course wetlands would have been classified as an estuarine wetland. Under the Cowardin classification system, this wetland would now be classified as a palustrine emergent wetland (PEM). The small amount of forested area within the site would be classified as palustrine forested wetlands (PFO).

The narrow fringe wetlands within the Kentuck Slough channel would be classified as estuarine, intertidal, emergent wetlands (Cowardin class) closer to the tidegate, and as PEM wetlands (Cowardin class) farther from the tidegate. The western portions of these wetlands, which experience brackish water conditions, would be classified as an estuarine fringe, marine-sourced, high tidal wetland under the HGM classification system. The eastern portions, which experience freshwater conditions, would be classified as an estuarine fringe, river-sourced wetland under the HGM classification system.

4.3 EXISTING AND PROPOSED HYDROLOGY

4.3.1 Eelgrass Mitigation Site – Existing Hydrology

Coos Bay is the water source for the Eelgrass Mitigation site. The site consists of an unvegetated sandflat below the average high tide elevation of Coos Bay and is surrounded by deeper water areas. The sandflat is exposed during lower tides.

4.3.2 Eelgrass Mitigation Site – Proposed Hydrology

Coos Bay will provide the water source for the Eelgrass Mitigation site. The site will be situated near the MLLW elevation, which will allow nearly permanent inundation of the site, except during very low tides. This is the natural hydrologic condition at which eelgrass flourishes within the bay, including areas adjacent to the Eelgrass Mitigation site.

4.3.3 Kentuck Project – Existing Hydrology

Hydrology within the Kentuck Project site is driven primarily by groundwater elevations and secondarily by direct precipitation. During wetland delineation efforts, groundwater was typically observed in soil pits from 10 inches depth to within an inch or two of the surface. Saturation typically occurred 2 inches above this depth. These conditions are typical of wintertime conditions. In summer, groundwater elevations are typically a foot or two deeper (Culp pers. comm. 2009). These observations are consistent with hydrology conditions described in the Coos County soils survey (USDA 1989). Hydrology is also provided by seeps near the base of hill slopes, where shallow subsurface flows come to the surface.

During site investigations shallow ponding has been observed in many locations throughout the golf course, but it was most pronounced in the western half. Ground topography throughout the golf course varies slightly, with roughly 2 to 3 feet of difference in topographic relief from location to location. Some flooding occurs from the surface drainages, particularly during high and incoming tides, when the tidegate on the culvert at the southwest corner of the golf course is closed. This effect is exacerbated during heavy or prolonged steady precipitation events; however, a pump at the southwest corner can be turned on to reduce such flooding.

Hydrology for the narrow fringe wetlands adjacent to the Kentuck Slough channel is primarily a function of flooding by tidal inundation and high flows within the Kentuck Slough channel. A high water table and saturation were observed in the soil pits. Shallow inundation (i.e., approximately 6 inches) occurred during high tide.

4.3.4 Kentuck Project – Proposed Hydrology

As previously noted, in this CWM Plan Kentuck Creek is used to refer to the portion of the drainage generally above the historic head of tide, while Kentuck Slough is used to refer to the portion of the drainage generally below the historic head of tide.

Hydrology to the Kentuck Project –Tidal Reconnection Area will be provided by tidal inundation from Coos Bay/Kentuck Inlet. Normal tidal cycles will substantially flood the property twice daily. Flows from Kentuck Slough will be partially routed through the site, and two small tributaries that currently run through the site will also provide sources of hydrology. In addition, hillside seeps will provide additional hydrology.

Hydrology to the Kentuck Project – Freshwater Floodplain Reconnection Area will be provided by direct precipitation and a seasonally high groundwater table, as is currently the case. It is important to note that Kentuck Creek flood flows will be allowed to enter the site as a result of removing the existing levee along this section of the Kentuck Project site.

4.4 EXISTING PLANT COMMUNITY DISTRIBUTIONS AND ABUNDANCE OF EXOTIC SPECIES

4.4.1 Eelgrass Mitigation Site

The proposed Eelgrass Mitigation site is primarily devoid of vegetation; however, some floating macroalgae (i.e., seaweed) may pass through the site. Some of the deeper areas adjacent to the proposed site contain eelgrass beds (*Zostera marina*) and associated epiphytic macroalgae.

4.4.2 Kentuck Project

The approximately 100-acre historical flood terrace has been delineated as an emergent wetland (palustrine emergent Cowardin class) plant community dominated by lawn/pasture grasses, with scattered native and ornamental tree plantings. Since golf course operations ceased, circa 2009, the flood terrace

has reverted to wet pasture and is grazed by cattle. The areas outside of the formerly maintained golf course grounds consist of forested wetlands (palustrine forested Cowardin class) and upland forest. A small and narrow fringe of high salt marsh community occurs along the lower portion of the Kentuck Slough channel. Six plant communities were identified during the wetland delineation and are described below.

4.4.2.1 Pasture Community

The Pasture community was is dominated by Kentucky bluegrass (*Poa pratensis*, FAC). This community occurs in the flats portion of the former golf course. Reed canarygrass (*Phalaris arundinacea*, FACW) and soft rush (*Juncus effusus*, FACW) are also prominent in places, having established since golf course maintenance activities ceased. This plant community is considered to be hydrophytic, because greater than 50 percent of the dominant plants with known indicator status are hydrophytic.

A second type of this community was found in upland locations, and it contains Kentucky bluegrass and hairy cat's ear (*Hypochaeris radicata*, FACU). This second community type occurs on maintained hill slopes. This type of the Pasture plant community is considered to be non-hydrophytic, because no greater than 50 percent of the dominant plants with known indicator status are hydrophytic.

Tree plantings occur in localized groupings throughout the former golf course, but they are not considered dominant. Tree species included Sitka spruce (*Picea sitchensis*, FAC), shore pine (*Pinus contorta*, FAC), and various ornamental species.

4.4.2.2 Weedy Upland

The Weedy Upland community is located primarily along the levee protecting the golf course from the Kentuck Slough channel. It is also occasionally found along semi-maintained areas along the toe of slopes along the south side of the site. The Weedy Upland community is dominated by Himalayan blackberry (*Rubus armeniacus*, FACU), trailing blackberry (*Rubus ursinus*, FACU), Scotch broom (*Cytisus scoparius*, UPL), tall fescue (*Schedonorus phoenix*, FAC), reed canarygrass, Kentucky bluegrass, and orchard grass (*Dactylis glomerata*, FACU). Hooker willow (*Salix hookeriana*, FACW) is also occasionally found in this community. This plant community is considered to be non-hydrophytic, because no greater than 50 percent of the dominant plants with known indicator status are hydrophytic.

4.4.2.3 Forested Wetland Community

The Forested Wetland community occurs at the base of hillside ravines along the south side of the golf course, where maintenance activities do not occur. Dominant vegetation consists of red alder (*Alnus rubra*, FAC), Oregon crab apple (*Malus fusca*, FACW), salmon berry (*Rubus spectabilis*, FAC), twin berry (*Lonicera involucrata*, FAC), trailing blackberry, small-fruited bulrush (*Scirpus microcarpus*, OBL), stinging nettle (*Urtica dioica*, FAC), slough sedge (*Carex obnupta*, OBL), skunk cabbage (*Lysichiton americanum*, OBL), deer fern (*Blechnum spicant*, FAC), creeping buttercup (*Ranunculus repens*, FACW), water parsley (*Oenanthe sarmentosa*, OBL), and youth on age (*Tolmiea menziesii*, FAC). This plant community is considered to be hydrophytic, because greater than 50 percent of the dominant plants with known indicator status are hydrophytic.

4.4.2.4 Forested Upland Community

The Forested Upland community occurs on the hillsides adjacent to the Forested Wetland community and maintained portions of the golf course. Dominant vegetation consists of Douglas fir (*Pseudotsuga menziesii*, FACU), red alder, cascara (*Rhamnus pershiana*, FAC), red elderberry (*Sambucus racemosa*, FACU), salmon berry, evergreen huckleberry (*Vaccinium ovatum*, UPL), salal (*Gaultheria shallon*, FACU), trailing blackberry, sword fern (*Polystichum munitum*, FACU), and deer fern. This plant community is considered to be non-hydrophytic, because no greater than 50 percent of the dominant plants with known indicator status are hydrophytic.

4.4.2.5 High Salt Marsh Community

The High Salt Marsh community is located towards the western end of Kentuck Slough, where some tidal influence occurs and results in saltwater/brackish water conditions. Dominant species include Lyngby sedge (*Carex lyngbyei*, OBL), with salt grass (*Distichlis spicata*, FACW) and tufted hairgrass (*Deschampsia caespitosa*, FACW) as common subdominants. This plant community is considered to be hydrophytic, because greater than 50 percent of the dominant plants with known indicator status are hydrophytic.

4.4.2.6 Reed Canarygrass Community

The Reed Canarygrass community is located towards the eastern end of Kentuck Slough. Tidal influence occurs; however, freshwater conditions predominate. Reed canarygrass is the sole dominant in this community. This community transitions into the High Salt Marsh community to the west, where water conditions grade from predominantly fresh to predominantly brackish. The Reed Canarygrass community is considered to be hydrophytic, because greater than 50 percent of the dominant plants with known indicator status are hydrophytic.

4.5 SITE CONSTRAINTS OR LIMITATIONS

4.5.1 Eelgrass Mitigation Site

Potential site constraints include the following:

- Site access for construction and monitoring is limited to barge and other watercraft.
- Dynamic site conditions are susceptible to force majeure (i.e., catastrophic events such as severe storm surge, tsunami, etc.).
- Impacts to adjacent eelgrass beds must be minimized.

4.5.2 Kentuck Project

Potential site constraints include the following:

- Opening the golf course to tidal influence creates the risk of increased flooding potential and saltwater intrusion to adjacent and upstream landowners. New levee construction and repair and/or enhancement of the existing levee are therefore required to reduce this risk. Levee construction and/or repair will result in additional wetland impacts that are accounted for in this plan.
- Portions of East Bay Drive and the golf course access road need to be elevated above tidal elevations to allow continued access to private residences and/or to comply with Coos County requirements. Road improvements will result in additional wetland impacts that are accounted for in this plan.
- Two overhead power lines traverse the mitigation site. Accommodations will need to be made to provide access to power poles.
- The site has encountered substantial subsidence that has required the import of fill to raise grades in order to provide desired habitat types. Importing this fill will entail transshipment of a large volume of JCEP dredge material to the site (this process is covered in detail in JCEP's Dredge Material Management Plan).
- PCGP proposes to install a new gas pipeline under the Kentuck Project site.

4.6 ENHANCEMENT PROJECTS

4.6.1 Factors Leading to Degraded Condition

Enhancement will occur at the Kentuck Project site. Before alteration, the area consisted of mudflats, and low and high salt marsh plant communities located along a broad intertidal terrace. The property has been diked from Coos Bay and managed for various uses over the decades, including use as pasture for grazing and use as a golf course. The factors leading to the degraded condition at the Kentuck Project site include the construction of levees and resulting isolation from Kentuck Inlet and Coos Bay; the construction of Kentuck Golf Course and appurtenances (e.g., cart paths, bridges, culverts); significant changes in vegetative communities resulting from altered site hydrology; and pumping and maintenance activities associated with golf course operations.

4.6.2 How CWM Plan Will Reverse Degradation

The CWM Plan will reverse degradation by breaching the levee and restoring tidal hydrology to the historical estuarine wetland, removing golf course appurtenances, and providing for the re-establishment of mudflat, salt marsh, and fringing freshwater wetland plant communities. Similarly, floodplain reconnection will occur at the far northeast end of the site, which will allow for establishment of freshwater wetland dominated by native species.

5. FUNCTIONS AND VALUES ASSESSMENT

5.1 ASSESSMENT METHODS USED

Wetland functions and values were evaluated for impacted wetlands and the mitigation sites pre- and post-mitigation. Table 5 lists the assessment methods used for various aspects of this CWM Plan.

Table 5. Functional Assessment Methods Used to Support this CWM Plan

Project and Components	Method: Rationale
LNG Terminal	
Freshwater wetland impacts	Oregon Rapid Wetland Assessment Protocol ("ORWAP"): This is the approved method for assessing functions and values in Oregon, particularly for projects that entail multiple wetland types.
Existing tidal habitats and Eelgrass Mitigation site (intertidal sand/mudflats, shallow subtidal, eelgrass, salt marsh, riprap embankment below HMT)	Best Professional Judgement: These habitats occur at the proposed slip and access channel, the Trans Pacific Parkway/US-101 intersection, along the west side of East Bay Drive at the Kentuck Project, and at the Eelgrass Mitigation site. ORWAP is not intended to assess these types of estuarine resources, with the exception of salt marsh. Salt marsh impacts are extremely small (0.06 acre) and are located adjacent to the other habitats noted above, and therefore have been included in this category.
Kentuck Project, pre- and post-mitigation	ORWAP: This method is appropriate for evaluating all wetland types at the site in its existing condition. This method also covers the many wetland types that will result post-mitigation. ORWAP does consider the presence of mudflats within the greater vegetated portion of a site. Therefore, mudflats that will form at the site have been included as a part of the overall site assessment.
Pipeline	
Forested and scrub-shrub wetlands converted to emergent wetlands	Best Professional Judgement: PCGP has not had site access to a number of the wetlands that will be impacted by the Pipeline. For purposes of this mitigation plan, PCGP conducted a functional assessment based on best professional judgement. Once access is allowed and site visits conducted, PCGP will follow up with an ORWAP-based assessment.

5.2 FUNCTIONS AND VALUES ASSESSMENT

The LNG Terminal functions and values assessment, including assessments of the pre- and post-mitigation conditions at the Kentuck Project site and Eelgrass Mitigation site, is provided in a memo in Appendix C. The Pipeline functions and values assessment is provided as a memo in Appendix D. The conclusions of these assessments are provided below.

5.2.1 LNG Terminal Function and Values Assessment Summary

Based on ORWAP, freshwater wetland group functions and values likely to be most affected by the LNG Terminal and that rated higher for values are Aquatic Habitat and Ecosystem Support functions. No functions at the proposed Kentuck Project site, under existing conditions, rated as higher. Meanwhile, post-mitigation scores for both the Kentuck Project site Tidal Reconnection Area and Freshwater Floodplain Reconnection Area rated as higher for Water Quality Support, Fish Habitat, Aquatic Habitat, and Ecosystem Support functions, all which received higher value ratings as well. These ratings suggest: (1) proposed mitigation at the Kentuck Project site results in functional uplift of important wetland values, and (2) the uplift at the Kentuck Project site will occur, at a minimum, to the same higher functioning and valued group functions that will be lost at the freshwater impact sites.

Estuarine habitat functions will be lost at the proposed LNG Terminal. Functions such as shellfish habitat, waterbird habitat, primary production, cover for juvenile fish, and egg-laying attachment areas for herring and other aquatic organisms may be provided at this impact site; however, due to site conditions, the impact site likely does not provide these functions at as high a level as some of the more diverse and ecologically complex locations found elsewhere in the bay. Lost estuarine functions will be offset at the Kentuck Project site and the Eelgrass Mitigation site, both of which are situated in and/or will result in a considerably more complex and diverse array of habitats than at the slip impact site, thus resulting in an overall uplift in functions lost.

5.2.2 Pipeline Function and Values Assessment Summary

For the Pipeline, functional impacts are likely to result in reduced functioning at a given impacted wetland rather than wholesale loss of function, because permanent wetland impacts entail a conversion of wetlands from forested or scrub-shrub wetland habitat to emergent wetland habitat, with emergent habitats often providing lower levels of function. Furthermore, Pipeline acreage impacts are all quite small. The largest single impact is 0.29 acre, with almost all other impacts being less than 0.10 acre. Estimated higher rating functions and values at the ORWAP group level likely to be reduced by the Pipeline impacts to forested and scrub-shrub wetlands include: Water Quality, Aquatic Support, and Ecosystem Support. The Pipeline's wetland functions and values impacts will be offset at the Kentuck Project site – Freshwater Reconnection Area. As described above for LNG Terminal freshwater impacts, ORWAP shows that the Kentuck Project site will result in notable uplift of functions that are of high value. The functional uplift also aligns with the higher functions and values estimated to be impacted by the Pipeline.

6. MAPS, DRAWINGS, AND CONSTRUCTION SPECIFICATIONS

6.1 SCALED SITE PLAN AND CROSS SECTIONS

Scaled site plans and cross sections for both mitigation sites are provided in Appendix A.

6.2 CONSTRUCTION SCHEDULE

Construction of the Project is anticipated to begin in the first half of 2019 and last approximately 60 months.

6.2.1 Eelgrass Mitigation Site

A proposed sequencing schedule for the Eelgrass Mitigation site is provided in Table 6. Mitigation construction is anticipated to begin in the fourth quarter of 2020. The schedule takes into account the following two key time periods that will affect mitigation activities:

- ODFW-approved in-water work period for the estuary: October 1 through February 15.
- Optimal eelgrass transplanting period (i.e., time of peak biomass): summer.

Table 6. Proposed Mitigation Project Sequencing Schedule – Eelgrass Mitigation Site

Year	Mitigation Activities
1	**Fall**: During in-water work period, excavate mitigation site to appropriate elevations. Post-excavation bathymetric survey or cross sections to be used in monitoring site stability.
2	**Late Spring/Early Summer**: Survey cross sections to monitor site stability after first winter storm season. Review and select eelgrass transplanting contractor. **Summer:** First eelgrass collection and transplanting treatment (test plots). Monitor reference/donor site for baseline growth characteristics. Post-transplanting monitoring of mitigation site to determine compliance with agreed-upon planting plan. **Fall/Winter:** Evaluate mitigation work to date and determine whether any corrective measures are needed for next season.

Year	Mitigation Activities
3	**Late Spring/Early Summer:** Survey cross sections to monitor site stability after second winter storm season. If site appears to be relatively stable, then site-stability monitoring in subsequent years would only occur if other monitoring efforts discover a notable change in site elevations that could prevent the mitigation from meeting the performance standard for Objective 1.2. **Summer**: Second eelgrass collection and transplanting. Monitor reference/donor site and mitigation site. **Fall/Winter**: Evaluate mitigation work and determine whether any corrective measures are needed for next season.
4	**Late Summer**: Monitor reference/donor site and mitigation site (first year in which percent cover at mitigation site can apply to meeting performance standard, assuming additional planting is not proposed for this year). **Fall/Winter:** Evaluate mitigation work and determine whether any corrective measures are needed for next season
5	**Summer:** Monitor reference/donor site and mitigation site (second year in which percent cover at mitigation site can apply to meeting performance standards, assuming additional planting is not proposed for this year). **Fall/Winter:** Evaluate mitigation work and determine whether any corrective measures are needed for next season. **If performance standards for Objective 1.2 have been met, then the mitigation project is considered a success, and future monitoring is no longer required. If performance standards for Objective 1.2 have not been met, then additional monitoring is required.**
6 – 8	Continue to monitor until performance standards for Objective 2 are met. If by the end of year 8 performance standards have still not been met, then Jordan Cove Energy Project, LP will consult with the agencies to determine future actions.

6.2.2 Kentuck Project

Mitigation construction for the Kentuck Project is anticipated to begin in the first half of 2019 and considers the following schedule constraints:

- In-water work window for the estuary: October 1 through February 15.
- In-water work window for Kentuck Slough (i.e., above the existing tidegate): July 1 through September 15.

See Table 7 for the sequencing schedule for the Kentuck Project site.

Table 7. Proposed Mitigation Project Sequencing Schedule – Kentuck Project Site

Year	Mitigation Activities
1	**Fall/Winter (beginning of estuary in-water work window)**: Mobilize. Install erosion and sediment control measures. Construct East Bay Drive detour. Construct East Bay Drive bridge, including cofferdams to prevent tidal exchange into golf course. Construct East Bay Drive roadway improvements. Construct golf course access roadway improvements. Deposit import material within site for surcharge to accelerate consolidation
2	**Late Spring/Early Summer**: Repair/augment existing levee. Construct/enhance channel. **Summer (beginning of Kentuck Slough in-water work window)**: Construct new tidegate structure with MTR gate in Kentuck Slough, including cofferdams. Final site grading and habitat improvements. **Fall/Winter (beginning of estuary in-water work window):** Remove or plug existing culvert under East Bay Drive and remove upstream culvert and tidegate. Remove cofferdams. Site cleanup and demobilization.

6.3 SCHEMATIC OF WATER CONTROL STRUCTURES

Water control structures are not anticipated for the Eelgrass Mitigation site. The Eelgrass Mitigation site will interact freely with Coos Bay. The Kentuck Project site will feature new tidegates. A schematic of the MTR gate array is included in Appendix A, Figure 11B.

6.4 PLANTING LISTS

A planting list for the Kentuck Project is provided in Appendix A, Figure 7. As noted in Section 1.3.3, Kentuck Tidal Reconnection Area, salt marsh vegetation is anticipated to establish by natural recruitment, particularly within lower salt marsh areas. Planting at the Eelgrass Mitigation site will consist solely of eelgrass (*Zostera marina*).

7. PERFORMANCE STANDARDS AND MONITORING PLAN

7.1 PERFORMANCE STANDARDS

Performance standards for each objective are presented below. Project objectives have been restated for the sake of convenience. The performance standards set the minimum requirements that need to be met to consider mitigation efforts successful. The monitoring plan has been developed to determine whether the mitigation sites are on track and will eventually meet the performance standards.

7.1.1 Eelgrass Mitigation Site

Mitigation Goal 1: Enhance a minimum of 6.03 acres of existing intertidal habitat to support a minimum of 2.01 acres of medium density or higher eelgrass beds and 4.02 acres of low density eelgrass beds. Density classes are defined as follows: less than 10 percent cover equals an absence of eelgrass bed; low density equals approximately 10 percent to 39 percent cover; medium density equals approximately 40 percent to 79 percent cover; and high density equals approximately 80 percent cover or greater.

Approximately 9.34 acres of construction will be undertaken to achieve this goal. This total area includes approximately 1.68 acres of low density eelgrass beds that may be temporarily disturbed to achieve design elevations, plus approximately 1.63 acres of voluntary habitat improvements above the minimum requirements.

To achieve this goal, the following objectives will be met:

- **Objective 1.1:** Grade (i.e., excavate) an area of approximately 6.03 acres minimum to provide suitable elevations for the establishment of eelgrass. Suitable elevations will be based on field observations of existing nearby robust eelgrass beds, which typically range between approximately 3 feet vertically either side of MLLW.

  Performance Standard: *A minimum of 6.03 acres within the mitigation site will be at elevations suitable for eelgrass establishment. Wave and current action may cause elevations to shift over time. This is acceptable as long as performance standards for Objective 1.2 are still likely to be met.*

- **Objective 1.2:** Transplant eelgrass plugs from donor sites to establish a minimum of 2.01 acres of medium density or higher eelgrass beds and 4.02 acres of low density eelgrass beds within the 6.03-acre recontoured area described under Objective 1.1. Additionally, transplant eelgrass plugs into the approximately 1.68-acre temporary impact area to maintain low density eelgrass beds and the 1.63-acre of voluntary habitat improvements.

  Performance Standard: *Site mapping will delineate a minimum of 2.01 acres of medium to high density eelgrass beds within the 6.03-acre recontoured area. An additional 5.70 acres (i.e., 4.02 acres + 1.68 acres) of low density eelgrass will be mapped within the mitigation area. Note that the acreage requirement for low density beds may be smaller if it is determined that a smaller*

acreage of temporary impacts to eelgrass actually occurred based on conditions at the time of site excavation. Also, it is recognized that the additional 5.70 acres of low density eelgrass may not occur as a uniform low density bed but may instead consist of a combination of low to high density areas with some patches of unvegetated sand/mudflat. Density classes are defined as follows: less than 10 percent cover equals an absence of eelgrass bed; low density equals approximately 10 percent to 39 percent cover; and medium to high density equals approximately 40 percent cover or greater.

Because of the documented natural annual variability of eelgrass bed coverage that can occur, it is not necessary for the mitigation site to constantly maintain the minimum acreage of 2.01 acres of medium to high density eelgrass beds and 5.70 acres of low density beds. The performance standards will have been met when the site meets the minimum acreage and density requirements for any two years, including nonconsecutive years, after the last year in which planting occurred.

7.2 KENTUCK PROJECT

7.2.1 Kentuck Project – Tidal Reconnection Area

Mitigation Goal 2: Reestablish tidal influence to a minimum of approximately 71.40 acres of historical intertidal habitats within the former golf course site.

Approximately 91 acres of construction will be undertaken to achieve this goal, including approximately 20 acres of voluntary habitat improvements above the minimum requirements. Additionally, JCEP anticipates providing substantially more vegetated habitat (e.g., salt marsh) than the minimum required because of salt marsh's higher productivity and historical loss within the watershed relative to mudflat.

To achieve this goal, the following objectives will be met:

- **Objective 2.1:** Construct a new bridge in East Bay Drive to allow tidal exchange between Kentuck Inlet and the Kentuck Project site.
- **Objective 2.2:** Remove or plug the existing culverts and tidegate located near the intersection of East Bay Drive and Golf Course Lane.
- **Objective 2.3**: Augment approximately 6,000 linear feet of levee along the Kentuck Project site and Kentuck Slough.
- **Objective 2.4**: Install an MTR in the augmented levee to provide fish passage and hydraulic exchange between the former golf course and Kentuck Slough.
- **Objective 2.5:** Restore tidal connection to the former irrigation pond creek system by constructing a fish-passable culvert or structure through Golf Course Lane.
- **Objective 2.6:** Construct and/or enhance approximately 11,500 linear feet of tide channels.
- **Objective 2.7:** Install fish habitat features. At a minimum, the following will be installed:
    - 4 complex wood structures (also known as fish houses)
    - 11 simple wood structures (for example, 1 to 3 pieces of large wood per structure)
    - 2 habitat pools

Performance Standard: *An as-built survey will show that the features noted in Objectives 2.1 through 2.7 have been constructed. Subsequent monitoring visits will show that these features are functioning as intended.*

- **Objective 2.8:** Establish a minimum of 71.40 acres of a combination of estuarine and fringing freshwater wetland habitats, of which a minimum of 5.88 acres will be vegetated habitats (i.e., salt marsh, palustrine forested, scrub-shrub, and emergent wetland).

  Performance Standard: *Habitat mapping/monitoring will show that the acreages of habitat types required by Objective 2.8 have been met. A greater amount of vegetated habitats, with a subsequent reduction in mudflat habitat, is acceptable.*

  Performance Standard: *For Objective 2.8, at the end of Year 5 (vegetation monitoring), the percent cover objectives enumerated below will be met, as determined through vegetation sample plots. These objectives are specific to the vegetation communities and minimum acreages noted above, and do not include mudflat areas. However, the entire Kentuck Project will be monitored, and plant communities will be managed to the same standards. Noxious weeds include those species designated as "A" or "B" by the Oregon Department of Agriculture Noxious Weed Control Program, as well as non-native cordgrass (*Spartina *sp.) species.*

  1. *The cover of native herbaceous species is at least 60 percent.*
  2. *The cover of invasive herbaceous species is no more than 20 percent.*
  3. *The cover of invasive shrub or tree species is no more than 10 percent.*
  4. *Bare substrate, in areas that clearly should have vegetation, represents no more than 20 percent cover.*
  5. *By Year 3 and thereafter, there are at least three different native species. To qualify, a species must have at least 5 percent average cover in the habitat class, and occur in at least 10 percent of the plots sampled. (This time period may be extended in the salt marsh habitat to account for natural recruitment processes.)*
  6. *Prevalence Index total for all strata is less than 3.0.*
  7. *Woody vegetation: Woody vegetation will be established in fringing freshwater forested and willow scrub-shrub wetland areas. The precise extent of these areas is subject to the interaction of fresh water coming into the site and salt water coming in from the bay. This success criterion should be focused on areas that actually support freshwater communities, as observed post-mitigation, rather than the extent of these communities as shown on design plans. Where this is the case, the density of woody vegetation performance standard will be: At least 1,600 native plants (shrubs) and/or stems (trees) per acre, or the cover of native woody vegetation on the site is at least 50 percent in the scrub-shrub and forested communities. Native species volunteering on the site may be included; dead plants do not count. Woody vegetation standards should be met for two successive years without irrigation. The woody vegetation success criterion is specific to scrub-shrub and forested communities in which freshwater conditions predominate.*

- **Objective 2.9**: Install a publicly accessible trail, to be located along the top of the augmented levee, and a boardwalk that will cross the northeast end of the site and follow near the toe of slope of the adjacent hillside.

  Performance Standard: *An as-built survey will show that the trail noted in Objective 2.9 has been constructed.*

7.2.1.1 Kentuck Project – Freshwater Floodplain Reconnection Area

Mitigation Goal 3: Reestablish floodplain connection to a minimum of approximately 2.49 acres of historical floodplain adjacent to Kentuck Creek and establish a mix of primarily forested and scrub-shrub wetland habitats. Approximately 9.12 acres of construction will be undertaken to achieve this goal, including approximately 6.63 acres of voluntary habitat improvements above the minimum requirements.

To achieve this goal, the following objectives will be met:

- **Objective 3.1:** Remove approximately 1,560 linear feet of existing levee between Kentuck Creek and the Kentuck Project site.
- **Objective 3.2:** Regrade the site to provide wetland hydrology and micro-topography to support a variety of plant species, and to the extent practical provide access and refugia to fish during high flow events.
- **Objective 3.3**: Install a minimum of four simple log structures (for example, one to three pieces of large wood per structure).

  Performance Standard: *An as-built survey will show that the features noted in Objectives 3.1 through 3.3 have been constructed. Subsequent monitoring visits will show that these features are functioning as intended.*

- **Objective 3.4:** Establish a minimum of 2.49 acres of mixed forest and scrub-shrub wetland plant communities, which may include patches of emergent wetland community, to foster overall habitat diversity.

  Performance Standard: *For Objective 2.9, at the end of Year 5 (vegetation monitoring), the percent cover objectives enumerated below will be met, as determined through vegetation sample plots. These objectives are specific to the vegetation communities and minimum acreages noted above and do not include mudflat areas. However, the entire Kentuck Project will be monitored, and plant communities will be managed to the same standards. Noxious weeds include those species designated as "A" or "B" by the Oregon Department of Agriculture Noxious Weed Control Program, as well as non-native cordgrass (*Spartina *sp.) species.*

  1. *The cover of native herbaceous species is at least 60 percent.*
  2. *The cover of invasive herbaceous species is no more than 30 percent; however, the site will be managed to minimize invasive herbaceous species below this performance criterion to the extent practicable. This portion of the Kentuck Project is highly*

*susceptible to invasion by reed canarygrass (*Phalaris arundinacea*) due to the high presence of this species along Kentuck Creek upstream of the Kentuck Project.*

3. *The cover of invasive shrub or tree species is no more than 10 percent.*
4. *Bare substrate, in areas that clearly should have vegetation, represent no more than 20 percent cover.*
5. *By Year 3 and thereafter, there are at least three different native species. To qualify, a species must have at least 5 percent average cover in the habitat class, and occur in at least 10 percent of the plots sampled.*
6. *Prevalence Index total for all strata is less than 3.0.*
7. *Woody vegetation: Woody vegetation will be established in freshwater forested and willow scrub-shrub wetland areas. At least 1,600 native plants (shrubs) and/or stems (trees) per acre, or the cover of native woody vegetation on the site is at least 50 percent in the scrub-shrub and forested communities. Native species volunteering on the site may be included; dead plants do not count. Woody vegetation standards should be met for two successive years without irrigation.*

7.3 MONITORING PLAN

The purpose of the mitigation monitoring requirement is to provide information for the agencies to: (a) determine whether the mitigation project complies with the conditions of the authorization; (b) evaluate whether the mitigation project meets the goals, objectives, and performance standards of the mitigation plan; and (c) provide information for removal-fill program monitoring.

JCEP will monitor the mitigation sites and provide a post-construction report and annual written monitoring report or reports to USACE and DSL. Monitoring reports will include all data necessary to document compliance with goals, objectives, and performance standards associated with the CWM Plan. This data may include photographs, topographic surveys, plant survival data, hydrologic data, and other information as required to demonstrate compliance.

The reports will include the following sections:

a. Introduction
b. Goals, objectives, and performance standards
c. Methods
d. Results
e. Summary and recommendations
f. Figures
g. Appendices with data and photographs

7.3.1 Monitoring Schedule

7.3.1.1 Eelgrass Mitigation Site

Monitoring will be conducted for a minimum of five years but may extend up to eight years if performance standards for Objective 2 are not met within the first five years, as described in Table 6.

7.3.2 Kentuck Project Site

Monitoring will be conducted for five years unless otherwise specified by USACE or DSL.

7.3.3 Monitoring Methods

7.3.3.1 Eelgrass Mitigation Site

Monitoring for the Eelgrass Mitigation site will occur using hydrographic survey methods. The proposed protocol is as described in this section, but it could be modified based on site conditions, technical limitations, or other reasons of practicality. Transects will be run across the mitigation site at 25-foot spacing using a single-beam echo sounder. A Differential Global Positioning System ("DGPS") will be used to track transect lines with submeter accuracy, which equates to roughly 40 transects if the transects are run perpendicular to the approximately 1,000-foot-long site. Transect direction could require adjustment in the field as a result of prevailing wind and tidal conditions. Ultimately, full to near full coverage of the site will occur based on 25-foot spacing of transects.

Appropriate single-beam technology will be used that can map both the bottom elevation and submerged aquatic vegetation (i.e., eelgrass). Transects will extend beyond the mitigation site and into adjacent existing eelgrass beds. Additional transects will occur as needed to assess the health and recovery of eelgrass plant stock donor sites and potentially at several reference sites to compare natural variability of eelgrass in the bay. A submerged camera or video tow will be used as needed to confirm data recorded by the single-beam echo sounder; however, because of the shallow nature of the site, visual observation from the boat deck might be sufficient.

Data from the single-beam transects will be analyzed against the objectives and performance standards as follows:

Objective 1.1: Cross-section bathymetry will be reviewed against desired elevations for eelgrass establishment. Change in bathymetry from post-construction excavation/dredging (i.e., as-built survey) to shortly after the first storm season will be reviewed to assess site stability before eelgrass planting occurs. Bathymetry data will be collected and reviewed in future years as warranted.

Objective 1.2: Eelgrass presence will be mapped along each transect. Within the mitigation site, individual transects will be subdivided into 10-foot-long sample segments (the "sample segments"). Each sample segment will be classified into one of three cover classes: (1) no eelgrass; (2) low density eelgrass (i.e., 10-percent to 39-percent cover); or (3) medium to high density eelgrass (i.e., 40-percent cover or greater). A tally of all sample segments by cover class will be conducted. To meet the objectives of

achieving 6.02 acres of suitable eelgrass habitat, with a minimum of 2.01 acres being classified as medium density eelgrass bed or higher, a minimum of 33 percent of all sample segments will have to be classified as medium to high density (based on 2.01 acres/6.02 acres). A similar approach will be applied to the proposed areas of low density eelgrass beds.

The duration of monitoring activities will be determined based on whether the Eelgrass Mitigation site has met the performance standards. Specifically, monitoring would continue until performance standards for Objective 1.2 are met, which would require a minimum monitoring period of five years; however, it is anticipated that performance standards for Objective 1.2 would more likely be met in Years 6 or 7. If, by the end of Year 8, performance standards have still not been met, then JCEP will consult with the regulatory agencies (USACE and DSL) to determine future actions.

7.3.3.2 Kentuck Project Site

To assess the likelihood of meeting the goals and objectives for the Kentuck Project site, the following monitoring efforts will be conducted. Although only a portion of the site is needed to meet success criteria, monitoring will take place across the entire site in order to assess overall site conditions and potential management needs.

Monitoring at the Kentuck Project site will consist of a post-construction site review to verify construction/removal of the specified bridge, levees, tidegates, channel reconstruction/enhancement, and other earthwork. This site review will occur shortly after completion of the proposed construction work. Site conditions will be documented with photographs and summarized in a report or technical memorandum (i.e., an as-built report). After construction, additional monitoring will occur for a period of five years.

Details of the monitoring plan are:

1. **Scour, erosion, and deposition monitoring of bridge, levee, MTR, and new culvert**

   Purpose: Assess infrastructure stability and risk of failure, and any sediment deposition concerns.

   a. Visual inspection (Year 1 (two visits); annual visit Year 2 and Year 5).
   b. Visual inspection will also occur after the first major flood event (e.g. 5 year storm event or any event known to have caused issues on-site or elsewhere around the bay/watershed).

2. **MTR performance monitoring**

   Purpose: Determine whether the MTR is performing as intended.

   a. Visual inspection of MTR performance relative to design performance specifications (Year 1 (two visits); annual visit Year 2 and Year 5).
   b. Visual inspection will also occur after the first extreme flood event.

3. **Site/channel evolution monitoring**

Purpose: Determine whether channel development is occurring within expected ranges and whether there is a risk of channels extending unsafely into adjacent infrastructure. Greatest channel development/change is anticipated within the first year after construction.

a. As-built survey (Year 0).
b. Visual inspection (Year 1 (two visits); annual visit Year 2 and Year 5).
c. Survey channel cross sections* (Years 1, 2, 3, and 5).
d. Survey upper extent of channels and center lines of newly forming channels* (Years 1, 2, 3, and 5).
e. Visual inspection will also occur after the first extreme flood event.

* Alternate methods may replace survey work of channel development if safety issues arise from conducting work on mudflats. The number of years of channel development monitoring may increase or decrease depending on findings (i.e., site stability is reached or excessive erosion concerns arise).

4. **Vegetation monitoring**

Purpose: Assess establishment of plant communities.

a. Vegetation plots in areas with proposed plant communities (not needed in mudflats) (Years 1 through 5) (see Section 7.1, Performance Standards, for additional details).
b. Map approximate extent of vegetated wetland/estuarine communities.

5. **Habitat features**

Purpose: Document proper installation and quantity of habitat features (e.g., large wood and habitat pools).

a. As-built survey (Year 0).
b. Visual inspection (Years 1 and 2).
c. Visual inspection will also occur after the first extreme flood event.

6. **Photo documentation**

Purpose: Visually document site changes over time.

a. Permanent photo points will be established around the site. Photo documentation will occur in conjunction with other monitoring efforts (Years 1 through 5).
b. Supplemental photos will be taken as appropriate to document site functionality as well as potential problem areas.

7.4 CONTINGENCY PLAN/ADAPTIVE MANAGEMENT PLAN

7.4.1 Eelgrass Mitigation Site

Contingency measures are based on principles of adaptive management. If monitoring shows that the performance standards are not being met or are not on a path to being met by the end of the monitoring period, then contingency measures will be needed. The following contingency measures are proposed to address potential foreseeable problems. Actual contingency measures would be based on monitoring data and site circumstances during the monitoring period:

1. If eelgrass transplants are surviving and appear healthy, but colonization of open areas is occurring too slowly or not at all, then additional transplanting would take place from a nearby healthy donor bed.
2. If eelgrass transplants are not surviving or appear unhealthy, then the following contingency measure would occur:
    - Mitigation site monitoring data will be compared with monitoring of the donor site and a reference site to determine whether poor eelgrass survivorship/health is occurring in adjacent areas, with the following potential courses of action:
        - If survivorship/health is poor in nearby areas, then the mitigation site could potentially be retransplanted. However, this re-transplantation should only occur once nearby eelgrass populations are healthy again.
        - If survivorship/health is good in nearby areas, then a review of transplanting technique and site elevations will occur to determine whether inappropriate installation methods were used, and/or whether elevations have changed and may be the root cause of poor success.
3. If inappropriate installation methods are found to have been used, then the site may be retransplanted once the installation method issue has been rectified.
4. If installation methods are deemed adequate, but elevations have changed so that they do not support eelgrass, then an assessment of site stability will be performed. If it is deemed possible to regrade the site, with acceptable adjustment so that elevations will be maintained naturally, then the site could be retransplanted. Replanting would occur at least one year after regrading occurs.
5. If installation methods are deemed adequate, elevations have not changed or have changed but cannot be appropriately rectified, and no other rectifiable source of plant failure can be identified, then no further actions would be proposed for this site. JCEP and the agencies would then discuss alternative mitigation strategies.

7.4.2 Kentuck Project

If the site does not meet the performance standards, including the identification of potential concerns to surrounding infrastructure, the potential cause or causes of the deficiencies or concerns will be evaluated as they arise, and solutions offered to the agencies.

8. LONG-TERM PROTECTION AND FINANCIAL SECURITY INSTRUMENTS

8.1 PROTECTION INSTRUMENT

8.1.1 Eelgrass Mitigation Site

The proposed Eelgrass Mitigation site is and will be owned by the State of Oregon.

JCEP anticipates endowing or otherwise funding a local non-profit organization that meets the requirements of Oregon Revised Statute ("ORS") 271.715(3)(b) to provide near-term (i.e., permit monitoring period) and long-term management and maintenance of all mitigation sites associated with the Project. JCEP anticipates this entity would hold the conservation easement from the State of Oregon for the Eelgrass Mitigation site. Clauses necessary to protect the site will be written into the easement(s).

During the construction and monitoring periods, floating signage and/or buoy markers will be used that identify the site as a mitigation site and that prohibit anchoring. JCEP will bear responsibility for site maintenance and enforcement of the prohibition on anchoring.

8.1.2 Kentuck Project

JCEP anticipates preparing and recording a deed restriction for the Kentuck Project site before commencing the work.

8.2 PROPOSED FINANCIAL SECURITY INSTRUMENT

JCEP will provide a surety bond specifically for the purpose of guaranteeing CWM site performance. In addition, JCEP will provide personal guarantees or other appropriate sureties (e.g., a letter of credit from the managing partner of the Limited Partnership or its parent company) that secures compliance with mitigation obligations and promises to make all reasonable efforts to maintain the business entity in an active status until all mitigation obligations have been satisfied.

8.3 LONG-TERM MAINTENANCE PLAN (POST-MONITORING PERIOD)

8.3.1 Anticipated Ownership

The Eelgrass Mitigation site will be owned by the State of Oregon, with an easement held by an appropriate third party. JCEP, or a sister company, will own the Kentuck Project site.

8.3.2 Anticipated Long-term Maintenance Actions

Long-term maintenance actions at the mitigation sites will take effect after the permit monitoring period has ended, which assumes that performance criteria have been met. Long-term maintenance actions could include the following, on an as-needed basis:

- At a minimum, conduct an annual site visit at each mitigation site to document potential management and maintenance needs
- Tidegate and bridge maintenance
- Levee maintenance
- Invasive/noxious weed control
- Garbage/debris removal
- Installation of protective signage and/or other deterrents if vandalism or inappropriate activities occur
- Maintenance of “no anchor” signage/buoys at the Eelgrass Mitigation site
- Installation of new native plantings and/or habitat features

A long-term management plan that incorporates the principles of adaptive management will be prepared as a condition of approval of the permit. The plan will discuss long-term management goals, general monitoring and maintenance guidance, reporting requirements, and roles and responsibilities. In line with the principles of adaptive management, the long-term management plan will be considered a living document that may be revised over time in an effort to best serve conservation needs and on-the-ground realities.

8.3.3 Entity Responsible for Maintenance

JCEP anticipates endowing or otherwise funding a local non-profit organization that meets the requirements of ORS 271.715(3)(b) to provide near-term (i.e., permit monitoring period) and long-term management and maintenance of all mitigation sites associated with the Project.

8.3.4 Anticipated Funding Source

JCEP will create an endowment to fund long-term maintenance of the mitigation sites.

9. PREPARERS AND CONTRIBUTORS

Ethan Rosenthal, DEA Ecologist, authored this report. Sean Sullivan, DEA Senior Project Manager, provided the quality review. Dawn Afman, DEA Project Assistant, prepared the report drafts. Melissa Foltz, Graphics Designer, provided graphics.

10. REFERENCES

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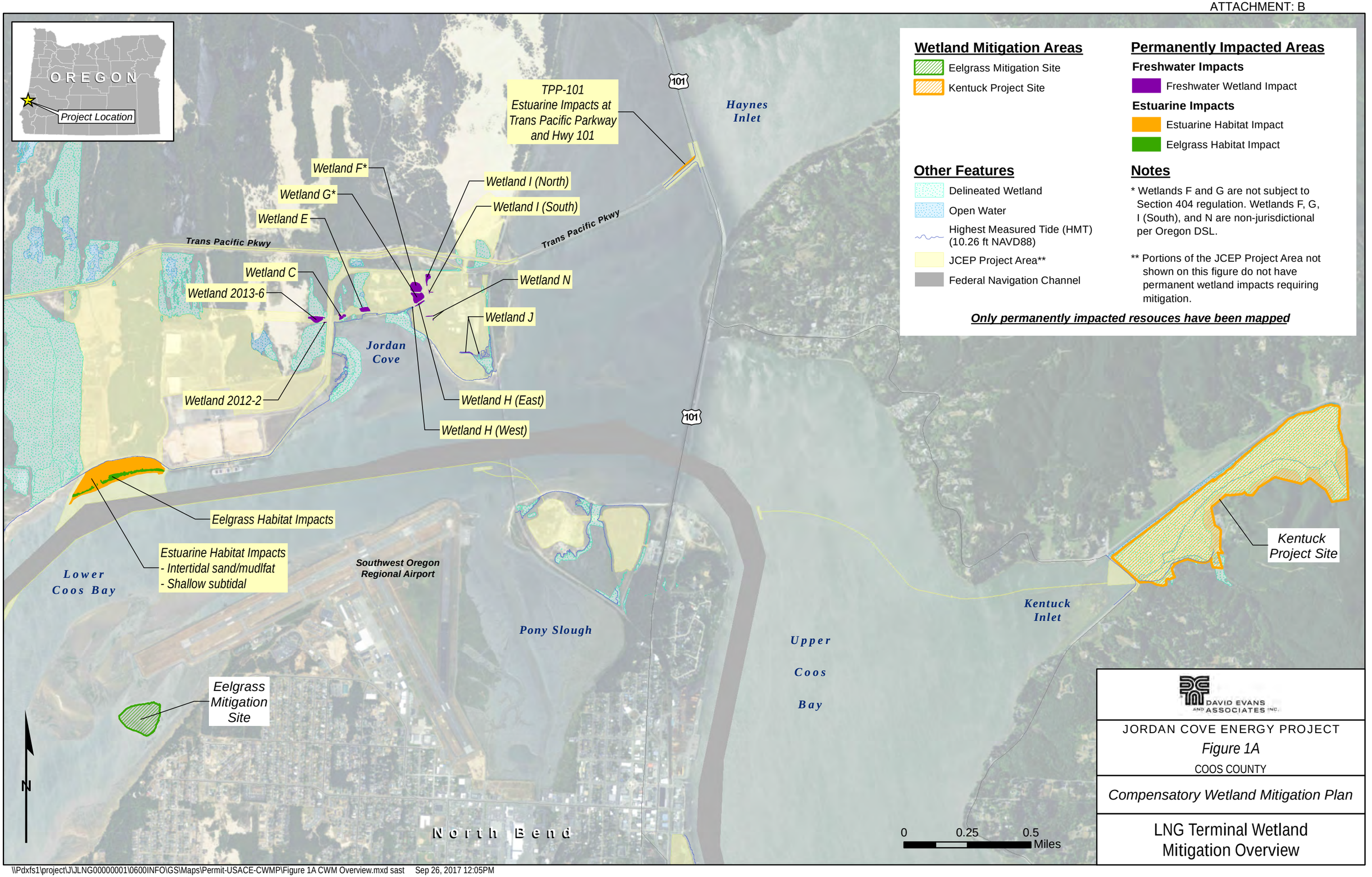
Rumrill, Steve. South Slough National Estuarine Research Reserve. Personal communication. 2006.

11. APPENDICES

APPENDIX A: FIGURES



Wetland Mitigation Areas

- Eelgrass Mitigation Site
- Kentuck Project Site

Permanently Impacted Areas

Freshwater Impacts

- Freshwater Wetland Impact

Estuarine Impacts

- Estuarine Habitat Impact
- Eelgrass Habitat Impact

Other Features

- Delineated Wetland
- Open Water
- Highest Measured Tide (HMT) (10.26 ft NAVD88)
- JCEP Project Area**
- Federal Navigation Channel

Notes

* Wetlands F and G are not subject to Section 404 regulation. Wetlands F, G, I (South), and N are non-jurisdictional per Oregon DSL.

** Portions of the JCEP Project Area not shown on this figure do not have permanent wetland impacts requiring mitigation.

Only permanently impacted resouces have been mapped

DAVID EVANS AND ASSOCIATES INC.

JORDAN COVE ENERGY PROJECT

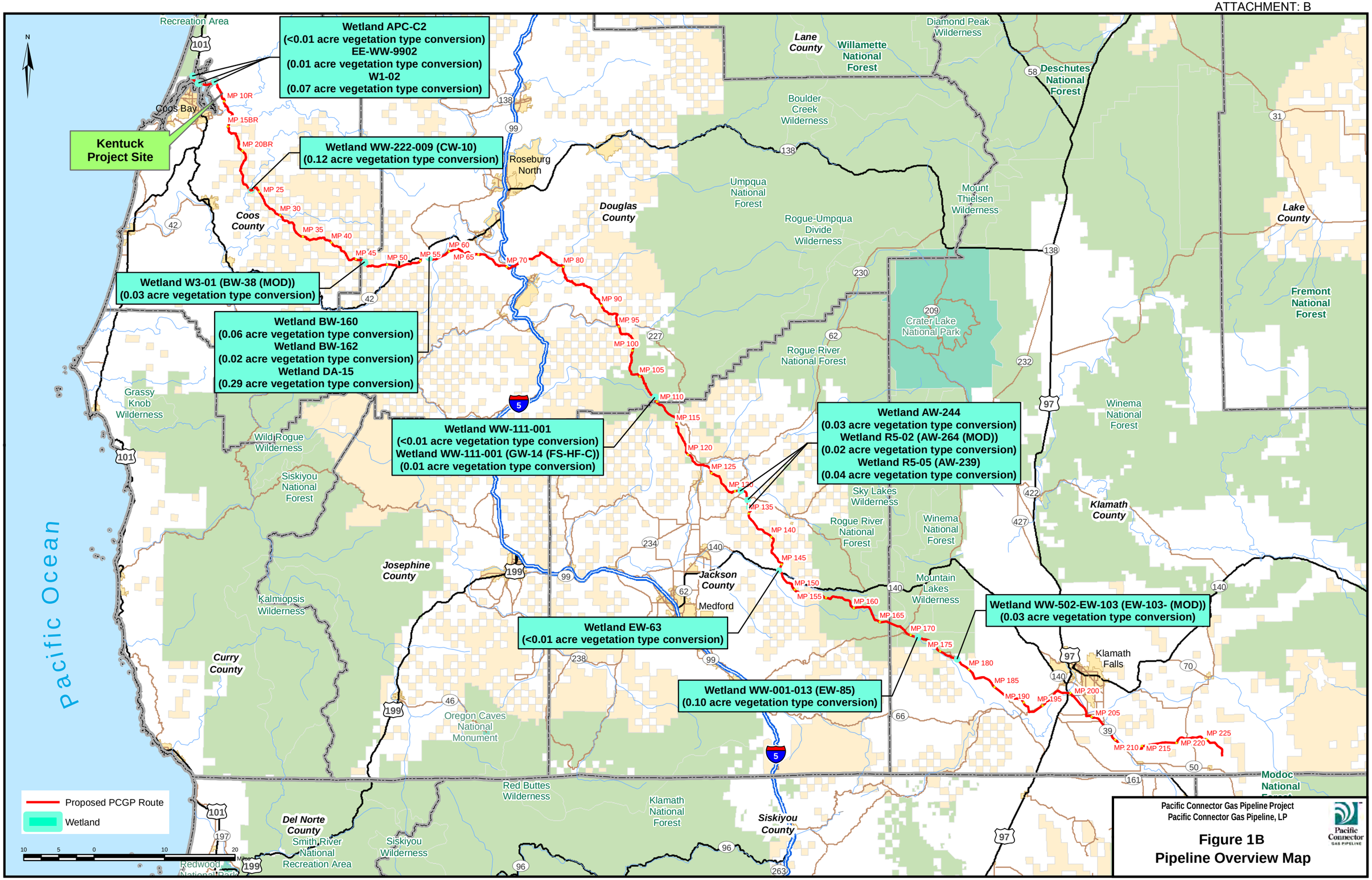
Figure 1A

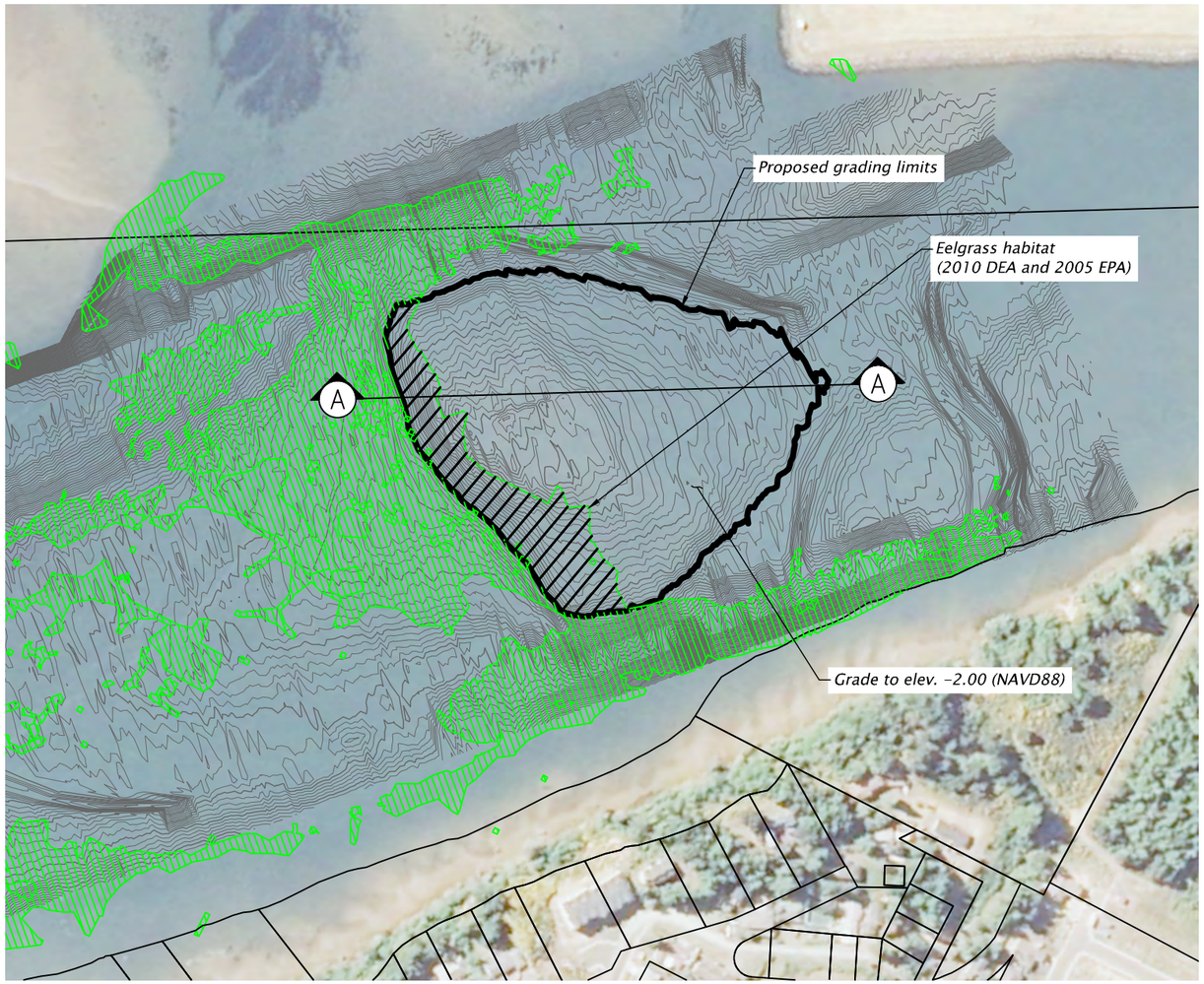
COOS COUNTY

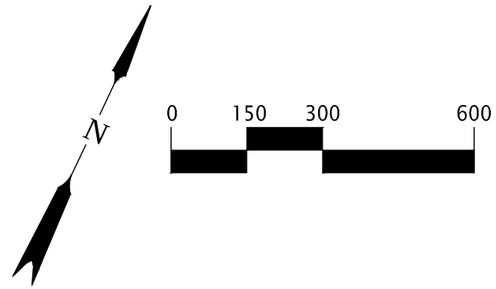
Compensatory Wetland Mitigation Plan

LNG Terminal Wetland Mitigation Overview

\\Pdxfs1\project\J\JLNG00000001\0600INFO\GS\Maps\Permit-USACE-CWMP\Figure 1A CWM Overview.mxd sast Sep 26, 2017 12:05PM


Wetland APC-C2
(<0.01 acre vegetation type conversion)
EE-WW-9902
(0.01 acre vegetation type conversion)
W1-02
(0.07 acre vegetation type conversion)
Kentuck Project Site
Wetland WW-222-009 (CW-10)
(0.12 acre vegetation type conversion)
Wetland W3-01 (BW-38 (MOD))
(0.03 acre vegetation type conversion)
Wetland BW-160
(0.06 acre vegetation type conversion)
Wetland BW-162
(0.02 acre vegetation type conversion)
Wetland DA-15
(0.29 acre vegetation type conversion)
Wetland WW-111-001
(<0.01 acre vegetation type conversion)
Wetland WW-111-001 (GW-14 (FS-HF-C))
(0.01 acre vegetation type conversion)
Wetland AW-244
(0.03 acre vegetation type conversion)
Wetland R5-02 (AW-264 (MOD))
(0.02 acre vegetation type conversion)
Wetland R5-05 (AW-239)
(0.04 acre vegetation type conversion)
Wetland EW-63
(<0.01 acre vegetation type conversion)
Wetland WW-001-013 (EW-85)
(0.10 acre vegetation type conversion)
Wetland WW-502-EW-103 (EW-103- (MOD))
(0.03 acre vegetation type conversion)
MP 10R
MP 15BR
MP 20BR
MP 25
MP 30
MP 35
MP 40
MP 45
MP 50
MP 55
MP 60
MP 65
MP 70
MP 80
MP 90
MP 95
MP 100
MP 105
MP 110
MP 115
MP 120
MP 125
MP 130
MP 135
MP 140
MP 145
MP 150
MP 155
MP 160
MP 165
MP 170
MP 175
MP 180
MP 185
MP 190
MP 195
MP 200
MP 205
MP 210
MP 215
MP 220
MP 225
Coos Bay
Roseburg North
Medford
Klamath Falls
Coos County
Douglas County
Josephine County
Jackson County
Curry County
Del Norte County
Siskiyou County
Klamath County
Lane County
Lake County
Pacific Ocean
Recreation Area
Grassy Knob Wilderness
Wild Rogue Wilderness
Siskiyou National Forest
Kalmiopsis Wilderness
Oregon Caves National Monument
Red Buttes Wilderness
Klamath National Forest
Smith River National Recreation Area
Siskiyou Wilderness
Redwood National Park
Umpqua National Forest
Rogue-Umpqua Divide Wilderness
Boulder Creek Wilderness
Willamette National Forest
Diamond Peak Wilderness
Deschutes National Forest
Mount Thielsen Wilderness
Rogue River National Forest
Crater Lake National Park
Sky Lakes Wilderness
Winema National Forest
Mountain Lakes Wilderness
Fremont National Forest
Modoc National Forest
Proposed PCGP Route
Wetland
Pacific Connector Gas Pipeline Project
Pacific Connector Gas Pipeline, LP
Figure 1B
Pipeline Overview Map





Wetland Mitigation Areas	Acres
Proposed easement area	20.47
Proposed grading area	9.34
Grading limits (area of eelgrass)	1.68

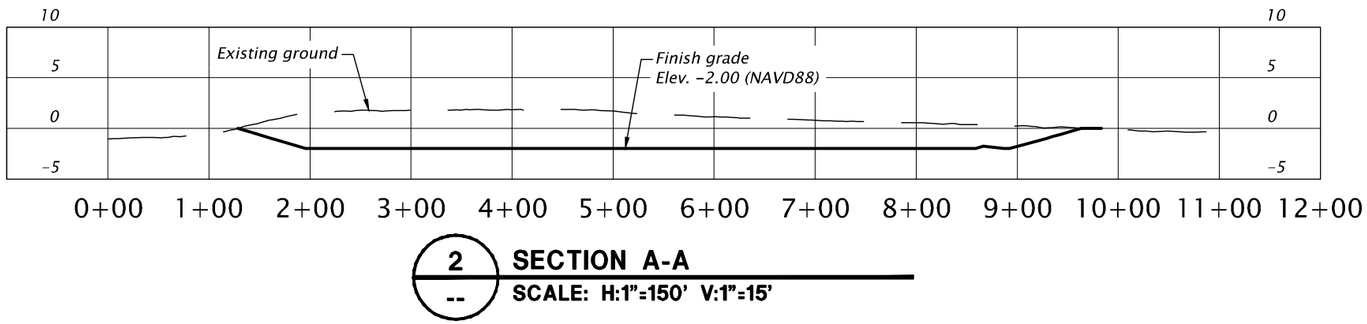
LEGEND

Eelgrass beds (DEA 2010 and EPA 2005)

Temporary eelgrass impact

1 -- GRADING PLAN
SCALE:1"=300'

NOTE:
Design elevations and grading subject to minor revisions as part of final design."



2 -- SECTION A-A
SCALE: H:1"=150' V:1"=15'

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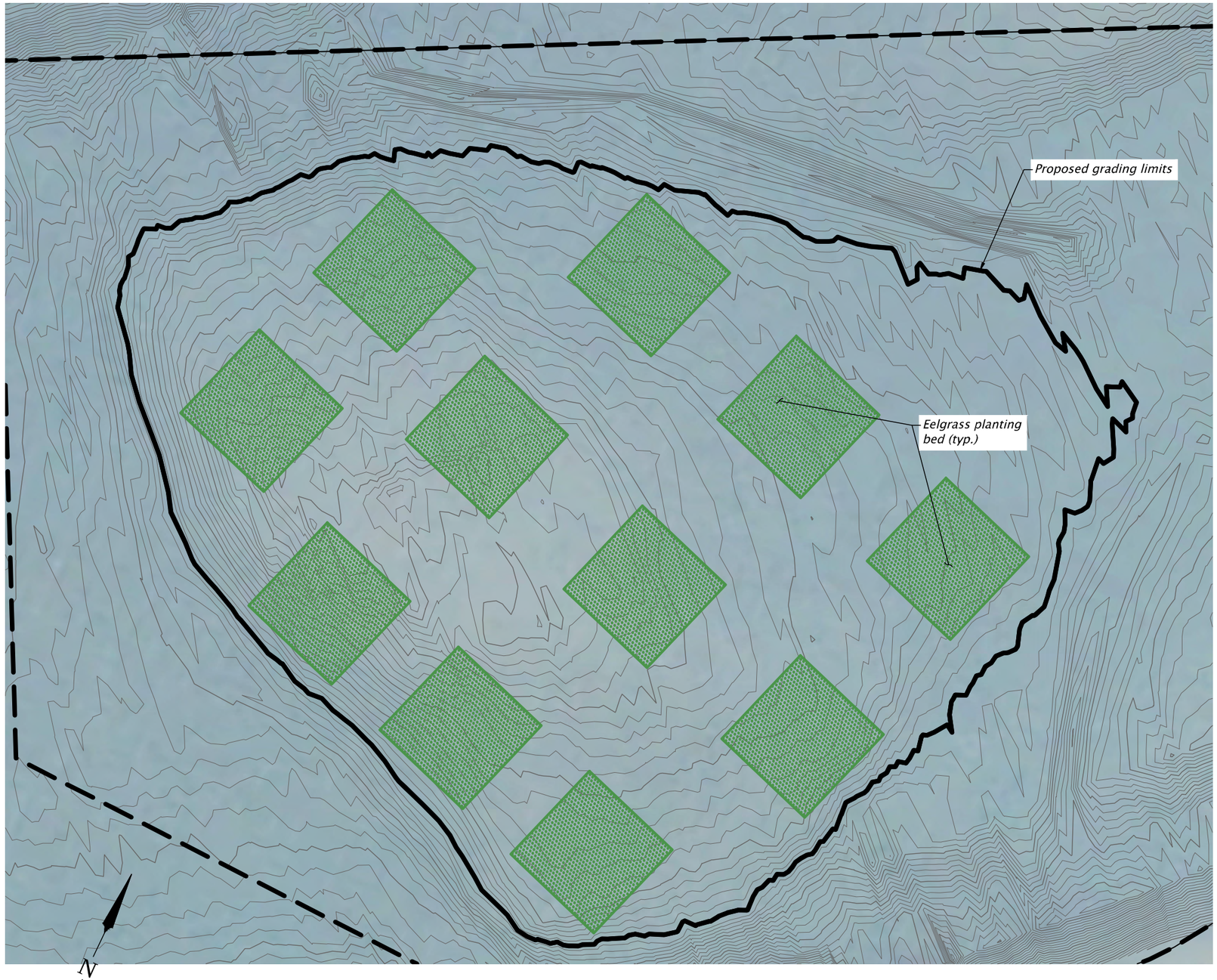
JORDAN COVE ENERGY PROJECT
EELGRASS MITIGATION SITE

COOS COUNTY

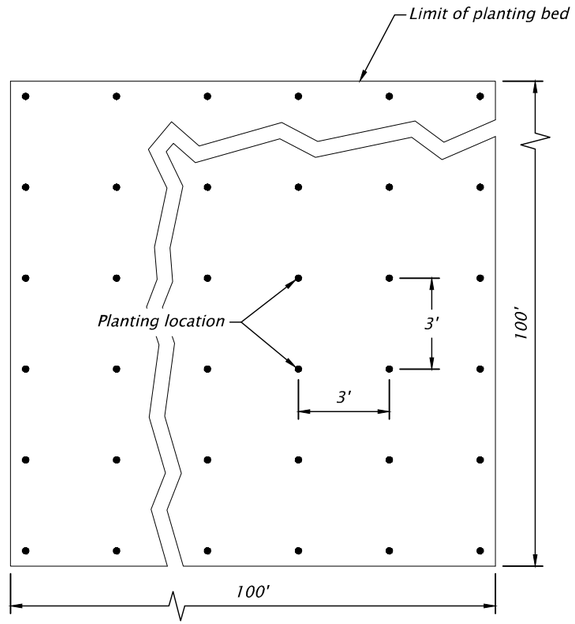
Designer: E. Rosenthal | Review: G. Oien
Drafter: J. Culpepper | Checker: CHECKED_BY

GRADIN PLAN

SHEET NO.
FIG 2



1 -- PLANTING PLAN
SCALE:1"=100'



2 -- PLANTING BED DETAIL
SCALE:NTS

NOTE:
Spacing and location of planting beds are approximate. eelgrass plant spacing based on typical spacing cited in literature. planting bed locations and plant spacing subject to change in final design.

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EELGRASS MITIGATION SITE

COOS COUNTY

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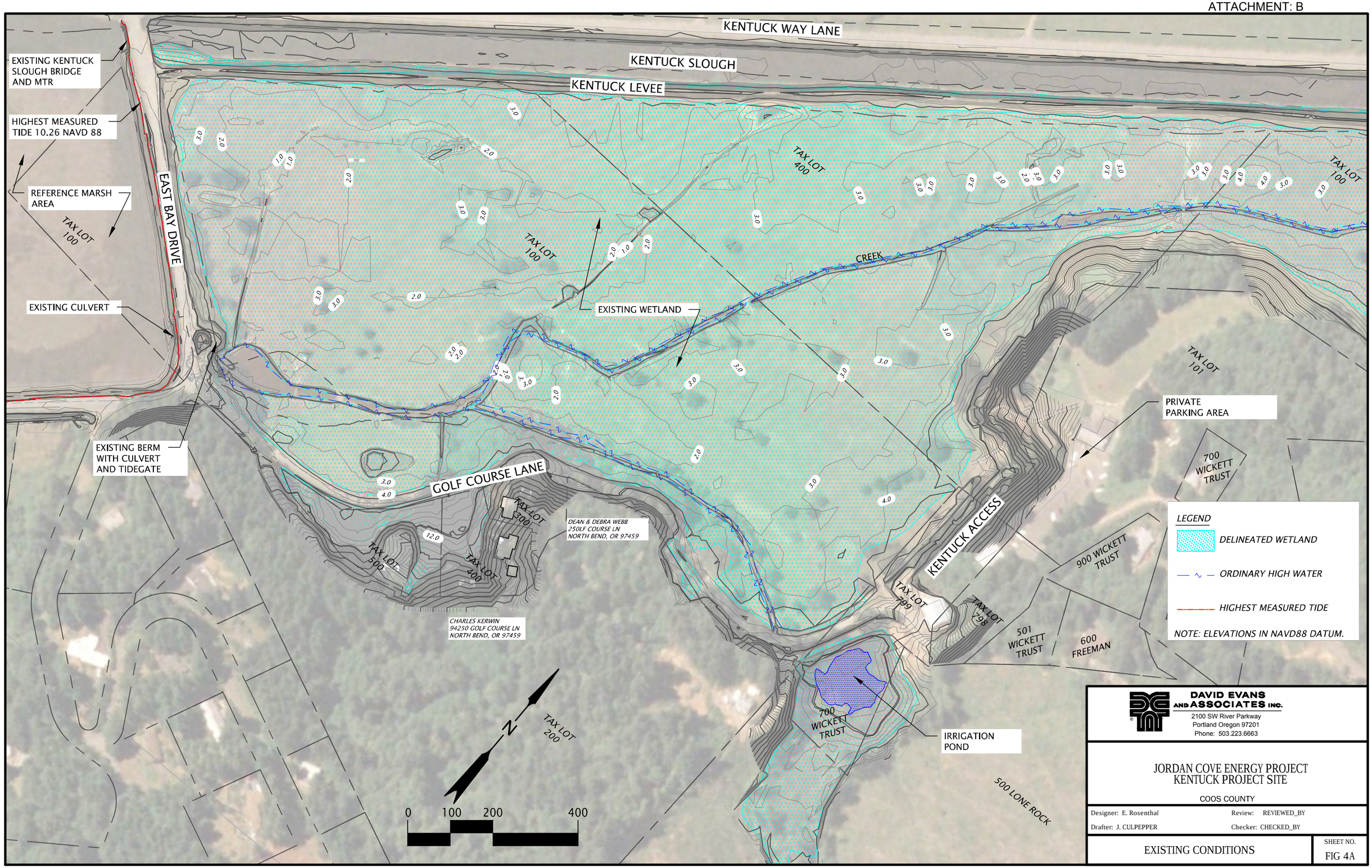
Drafter: J. Culpepper | Checker: CHECKED_BY

PLANTING PLAN | SHEET NO. FIG 3

ATTACHMENT: B



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JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

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Drafter: J. CULPEPPER	Checker: CHECKED_BY

EXISTING CONDITIONS

SHEET NO.
FIG 4A

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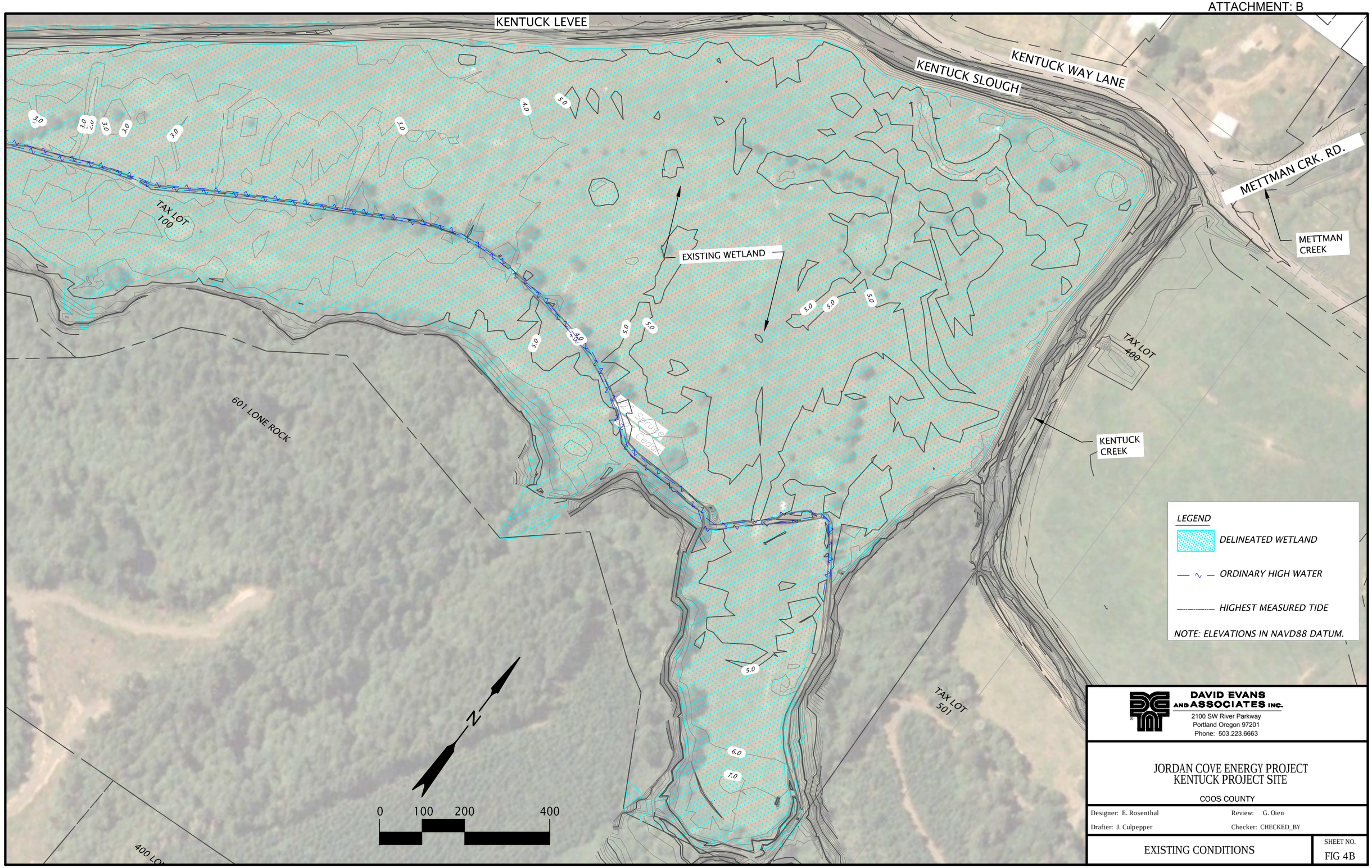

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COOS COUNTY

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Drafter: J. Culpepper | Checker: CHECKED_BY

EXISTING CONDITIONS

SHEET NO.
FIG 4B

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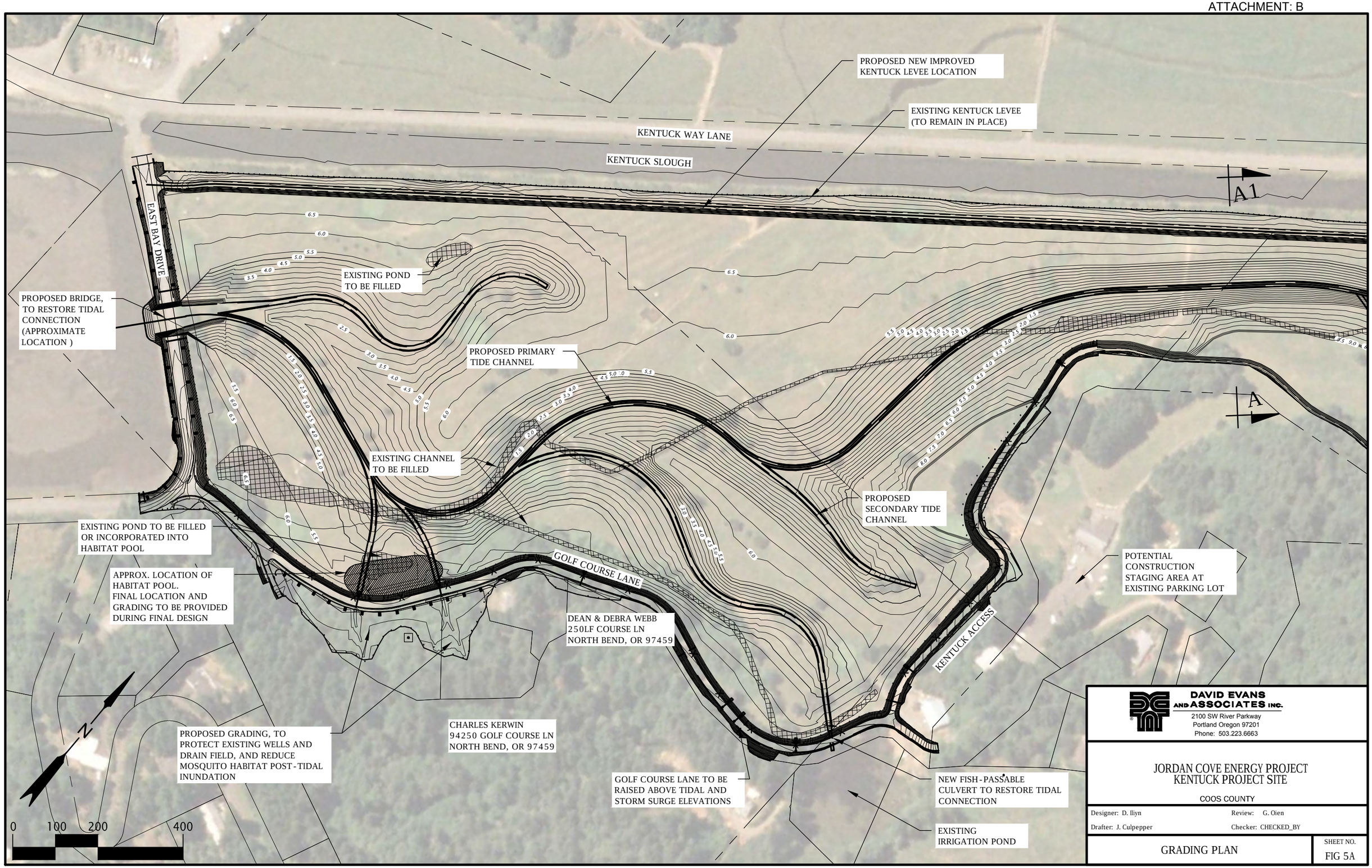

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COOS COUNTY

Designer: D. Iliyn	Review: G. Oien
Drafter: J. Culpepper	Checker: CHECKED_BY

GRADING PLAN

SHEET NO. FIG 5A

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ATTACHMENT: B

KENTUCK SLOUGH

EXISTING KENTUCK LEVEE (TO REMAIN IN PLACE)

PROPOSED NEW IMPROVED KENTUCK LEVEE LOCATION

PROPOSED MUTED TIDAL REGULATOR STRUCTURE

SWALE

KENTUCK WAY LANE

B1

EXISTING LEVEE TO BE REMOVED

PROPOSED PRIMARY TIDE CHANNEL

APPROX. LOCATION OF HABITAT POOL AND INLET/OUTLET CHANNELS. FINAL LOCATION AND GRADING TO BE PROVIDED DURING FINAL DESIGN.

B

FRESHWATER WETLAND FLOODPLAIN RECONNECTION AREA

PROPOSED NEW IMPROVED KENTUCK LEVEE LOCATION

EXISTING LEVEE TO BE REMOVED

APPROX. LOCATION OF SEEP CONNECTION CHANNELS

PROPOSED SOFT SURFACE TRAIL

SWALE

PROPOSED BOARDWALK TRAIL CONNECTION

HISTORIC CHANNEL ALIGNMENT RESTORED

FILL DITCHED CREEK ALIGNMENT

HUMMOCKS

C

C1

HUMMOCKS

CONNECTIONS TO OFF SITE DRAINAGES

N

0 100 200 400

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KENTUCK PROJECT SITE

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GRADING PLAN

SHEET NO. FIG 5B

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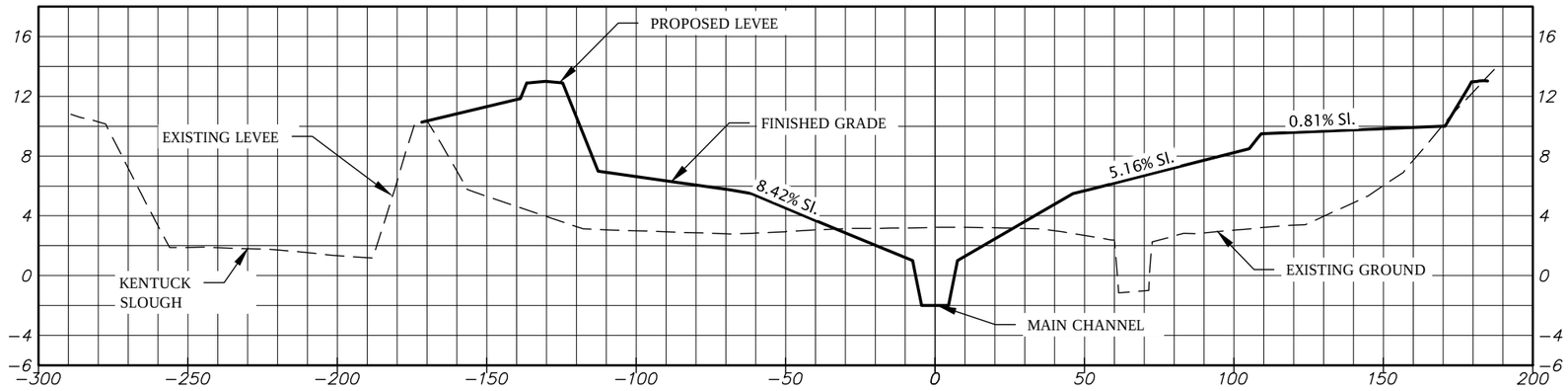

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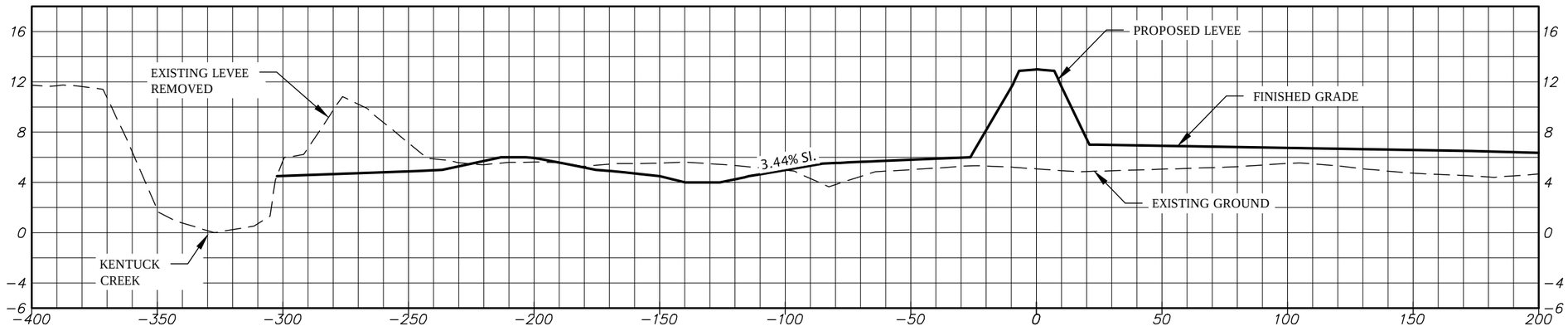

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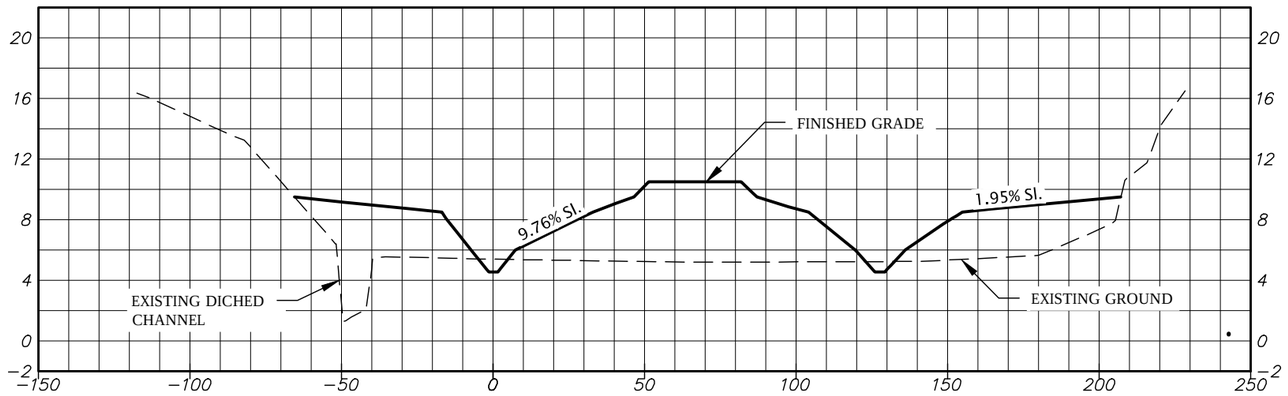

SECTION C1 - C

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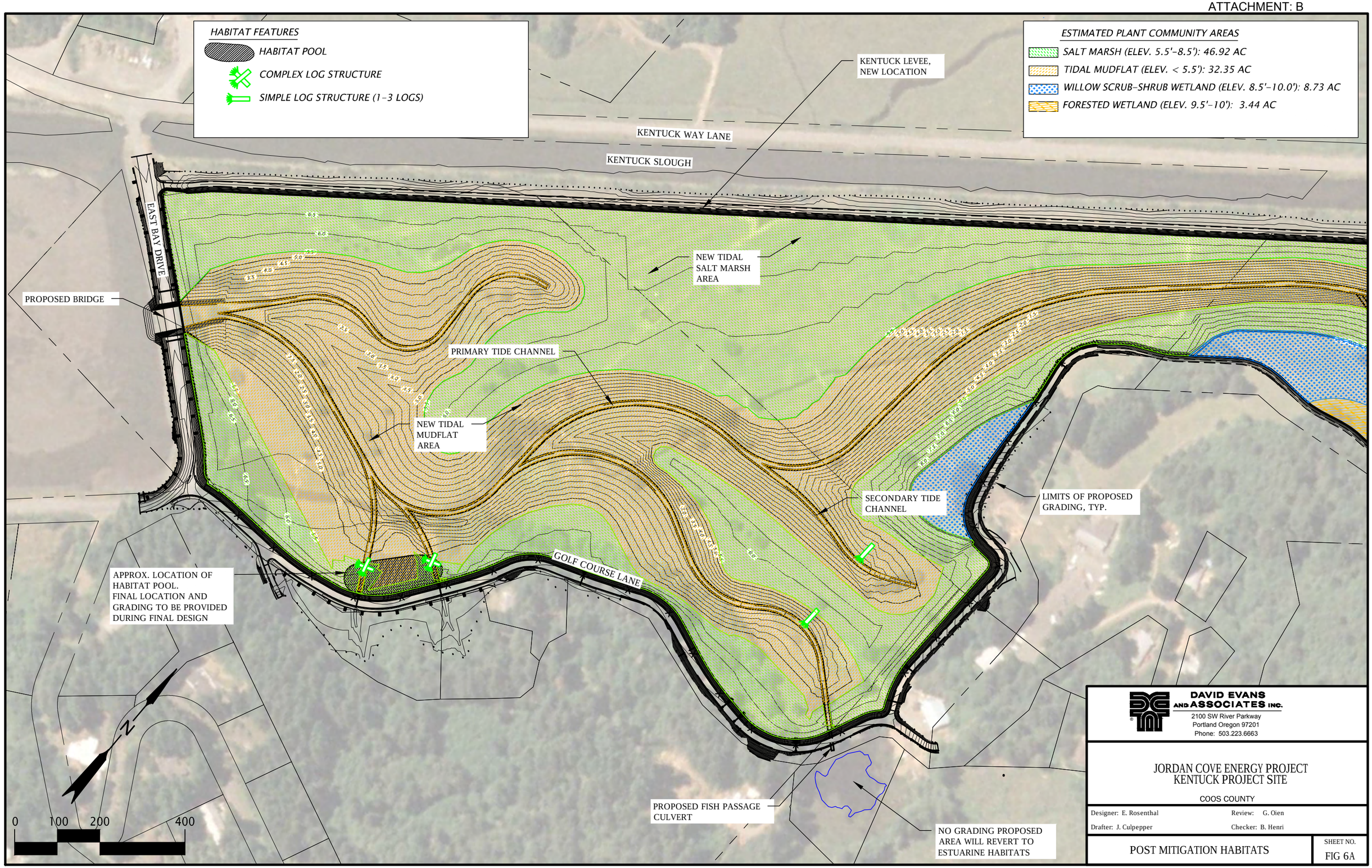
KENTUCK PROJECT SITE

COOS COUNTY

Designer: E. Rosenthal | Review: G. Oien
Drafter: J. Culpepper | Checker: CHECKED_BY

GRADING PLAN

SHEET NO.
FIG 5C



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JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: E. Rosenthal | Review: G. Oien
Drafter: J. Culpepper | Checker: B. Henri

POST MITIGATION HABITATS

SHEET NO. FIG 6A

C:\pw_work\jordan_cove_lng\jxc\dms02488\Kentuck_Proposed Planting Plan_Exhibit 9/26/2017 9:47 AM Jim Culpepper

ATTACHMENT: B

KENTUCK SLOUGH

PROPOSED TIDEGATE

KENTUCK LEVEE, NEW LOCATION

KENTUCK WAY LANE

PRIMARY TIDE CHANNEL

APPROX. LOCATION OF HABITAT POOL AND INLET/OUTLET CHANNELS. FINAL LOCATION AND GRADING TO BE PROVIDED DURING FINAL DESIGN.

SECONDARY TIDE CHANNEL

APPROX. LOCATION OF SEEP CONNECTION CHANNELS

ESTIMATED PLANT COMMUNITY AREAS

- *SALT MARSH (ELEV. 5.5'-8.5'): 46.92 AC*
- *TIDAL MUDFLAT (ELEV. < 5.5'): 32.35 AC*
- *WILLOW SCRUB-SHRUB WETLAND (ELEV. 8.5'-10.0'): 8.73 AC*
- *FORESTED WETLAND (ELEV. 9.5'-10'): 3.44 AC*

FRESHWATER FLOODPLAIN AREA

- *EMERGENT WETLAND (ELEV. 4.0'-4.5'): 1.24 AC*
- *WILLOW SCRUB-SHRUB WELTAND (ELEV. 4.5'-5.5'): 4.72 AC*
- *FORESTED WETLAND (ELEV. 5.5'-6.0'): 3.16 AC*

HABITAT FEATURES

- *HABITAT POOL*
- *COMPLEX LOG STRUCTURE*
- *SIMPLE LOG STRUCTURE (1-3 LOGS)*

N

0 100 200 400

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JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: E. Rosenthal Review: G. Oien

Drafter: J. Culpepper Checker: B. Henri

POST MITIGATION HABITATS

SHEET NO. FIG 6B

C:\pw_work\jordan_cove_lng\jxc\dms02488\Kentuck_Proposed Planting Plan_Exhibit 9/26/2017 9:47 AM Jim Culpepper

Kentuck Site Proposed Planting List

-species subject to change per design refinements and availability

Kentuck Site (Salt Marsh- Plantings and Estimated Volunteer Recruitment)					
Deschampsia cespitosa	*Tufted hairgrass*	*FACW*			
Hordeum brachyantherum	*Meadow barley*	*FACW*			
Carex lyngbei	*Lyngby's sedge*	*OBL*			
Grindelia integrifolia	*Gumweed*	*FACW*			
Argentina egedii	*Pacific silverweed*	*OBL*			
Distichlis spicata	*Saltgrass*	*FACW*			
Scirpus americanus	*American threesquare*	*OBL*			
Salicornia virginica	*Pickleweed*	*OBL*			
Schoenoplectus pungens	*Common threesquare*	*OBL*			
Kentuck Site (Freshwater Wetland Plantings)			Forest Community	Willow Scrub-Shrub	Emergent
Alnus rubra	*Red alder*	*FAC*	*X*		
Picea sitchensis	*Sitka spruce*	*FAC*	*X*	*X (low density)*	
Myrica californica	*California wax myrtle*	*FACW*	*X*	*X*	
Malus fusca	*Oregon crab apple*	*FACW*	*X*		
Salix hookeriana	*Hooker's willow*	*FACW*	*X*	*X (high density)*	
Lonicera involucrata	*twinberry*	*FAC*	*X*	*X*	
Spiraea douglasii	*Douglas spirea*	*FACW*	*X*	*X*	
Rubus spectabilis	*salmon berry*	*FAC*	*X*		
Carex obnupta	*slough sedge*	*OBL*	*X*	*X*	*X*
Juncus ensifolius	*daggerleaf rush*	*FACW*	*X*	*X*	*X*
Scirpus microcarpus	*small-fruited bulrush*	*OBL*	*X*		*X*
Argentina egedii	*Pacific silverweed*	*OBL*	*X*	*X*	*X*
Distichlis spicata	*Salt grass*	*FACW*	*X*	*X*	*X*
Hordeum brachyantherum	*Meadow barley*	*FACW*	*X*	*X*	*X*
Deschampsia caespitosa	*tufted hairgrass*	*FACW*	*X*	*X*	*X*

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JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: E. Rosenthal | Review: G. Oien
Drafter: J. Culpepper | Checker: CHECKED_BY

PROPOSED PLANTING PLAN

SHEET NO. FIG 7

NOTE:
1. WETLAND IMPACTS ARE MEASURED FROM THE 8.5' CONTOUR OF THE INTERIOR PROPOSED LEVEE AND ROAD FILL SLOPES AND WITH DELINEATED WETLAND BOUNDARIES.
2. TEMPORARY IMPACTS ONLY SHOWN FOR PROPOSAL CONSTRUCTION DETOUR. HOWEVER, TEMPORARY WETLAND IMPACTS WILL OCCUR ACROSS THE SITE AS A RESULT OF GRADING.
3. PERMANENT RESTORATION ARE AREAS WITHIN HISTORIC TIDAL FLOOD PLAIN ZONES BUT OUTSIDE CURRENT DELINEATED WETLANDS.

N

PERMANENT ESTUARINE IMPACT DUE TO ROADSIDE GRADING = 0.03 AC

PROPOSED LEVEE, PERMANENT WETLAND IMPACT = 4.30 AC

CONSTRUCTION DETOUR OF EAST BAY ROAD:TEMPORARY WETLAND IMPACT = 0.47 AC

TEMPORARY ESTUARY IMPACT (DUE TO BRIDGE CONSTRUCTION) = 0.04 AC

PERMANENT ESTUARINE IMPACT DUE TO ROADSIDE GRADING = 0.04 AC

PROPOSED ENHANCEMENT

PROPOSED CHANNEL

LIMITS OF EXISTING WETLAND, TYP.

ROAD IMPROVEMENT, PERMANENT: WETLAND IMPACT = 0.14 AC

PROPOSED HABITAT POOL

WELL AND DRAINFIELD PROTECTION, PERMANENT WETLAND IMPACT = 0.85 AC

ROAD IMPROVEMENT, PERMANENT WETLAND IMPACT = 0.04 AC

PROPOSED RESTORATION

INCIDENTAL IMPACTS LEGEND & TOTAL IMPACTS

- PERMANENT IMPACT [1] – 5.47 AC
- TEMPORARY IMPACT [2] – 0.51 AC
- PERMANENT RESTORATION [3] – 5.56 AC
- PERMANENT ENHANCEMENT – 95.04 AC

0 100 200 400

DAVID EVANS AND ASSOCIATES INC.
2100 SW River Parkway
Portland Oregon 97201
Phone: 503.223.6663

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

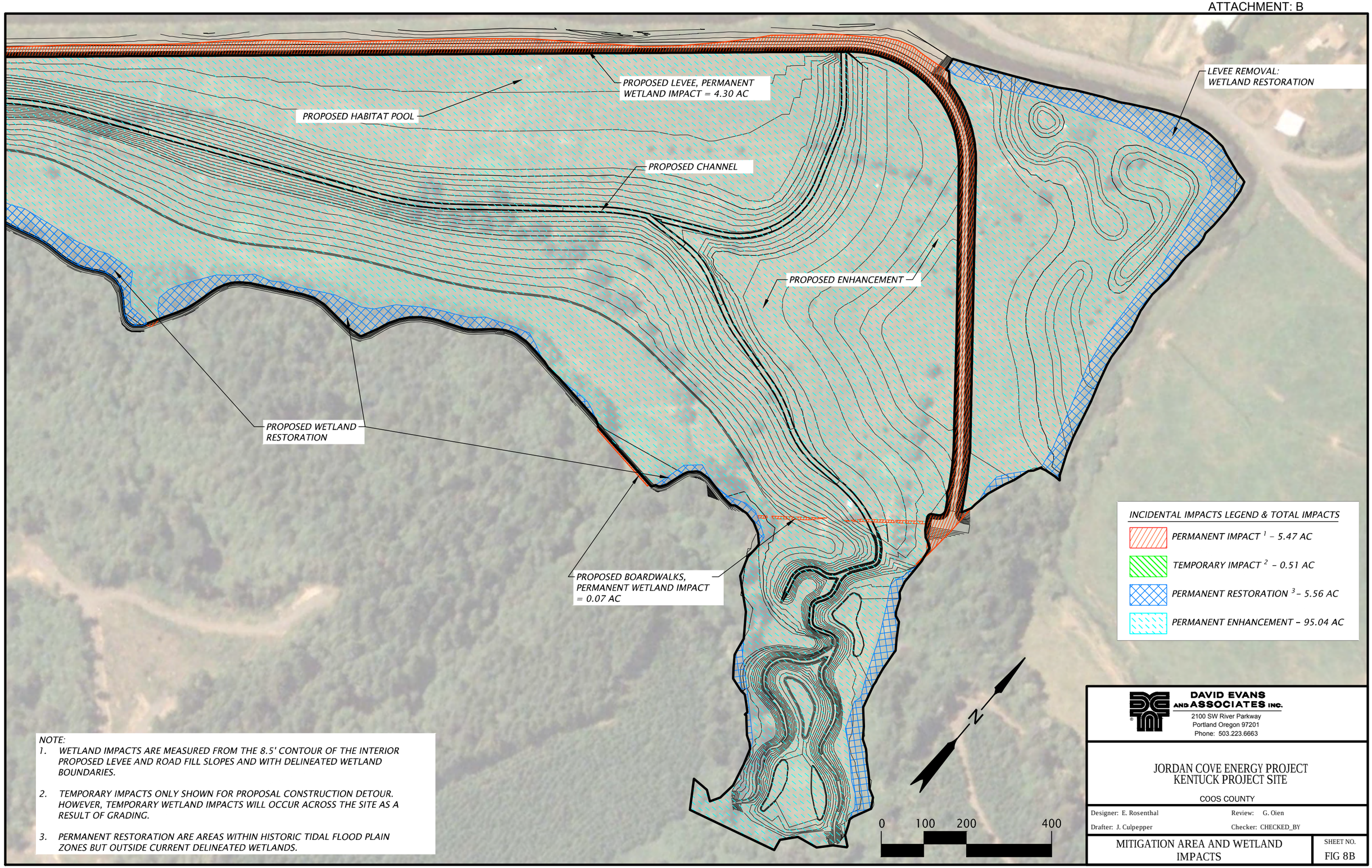
COOS COUNTY

Designer: E. Rosenthal | Review: G. Oien
Drafter: J. Culpepper | Checker: CHECKED_BY

MITIGATION AREA AND WETLAND IMPACTS

SHEET NO. FIG 8A

C:\pw_work\jordan_cove_lng\jxc\dms02488\Kentuck_Mitigation Area & Wetland Impacts_Exhibit 9/26/2017 9:48 AM Jim Culpepper



INCIDENTAL IMPACTS LEGEND & TOTAL IMPACTS

- *PERMANENT IMPACT [1] – 5.47 AC*
- *TEMPORARY IMPACT [2] – 0.51 AC*
- *PERMANENT RESTORATION [3] – 5.56 AC*
- *PERMANENT ENHANCEMENT – 95.04 AC*

NOTE:

1. *WETLAND IMPACTS ARE MEASURED FROM THE 8.5' CONTOUR OF THE INTERIOR PROPOSED LEVEE AND ROAD FILL SLOPES AND WITH DELINEATED WETLAND BOUNDARIES.*
2. *TEMPORARY IMPACTS ONLY SHOWN FOR PROPOSAL CONSTRUCTION DETOUR. HOWEVER, TEMPORARY WETLAND IMPACTS WILL OCCUR ACROSS THE SITE AS A RESULT OF GRADING.*
3. *PERMANENT RESTORATION ARE AREAS WITHIN HISTORIC TIDAL FLOOD PLAIN ZONES BUT OUTSIDE CURRENT DELINEATED WETLANDS.*

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JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

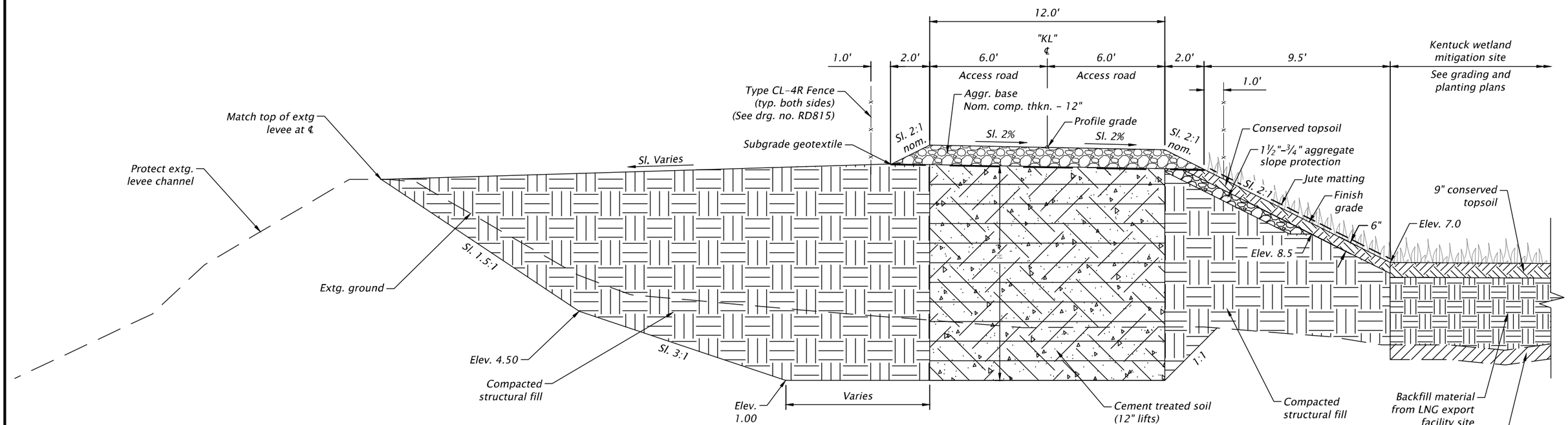
COOS COUNTY

Designer: E. Rosenthal | Review: G. Oien
Drafter: J. Culpepper | Checker: CHECKED_BY

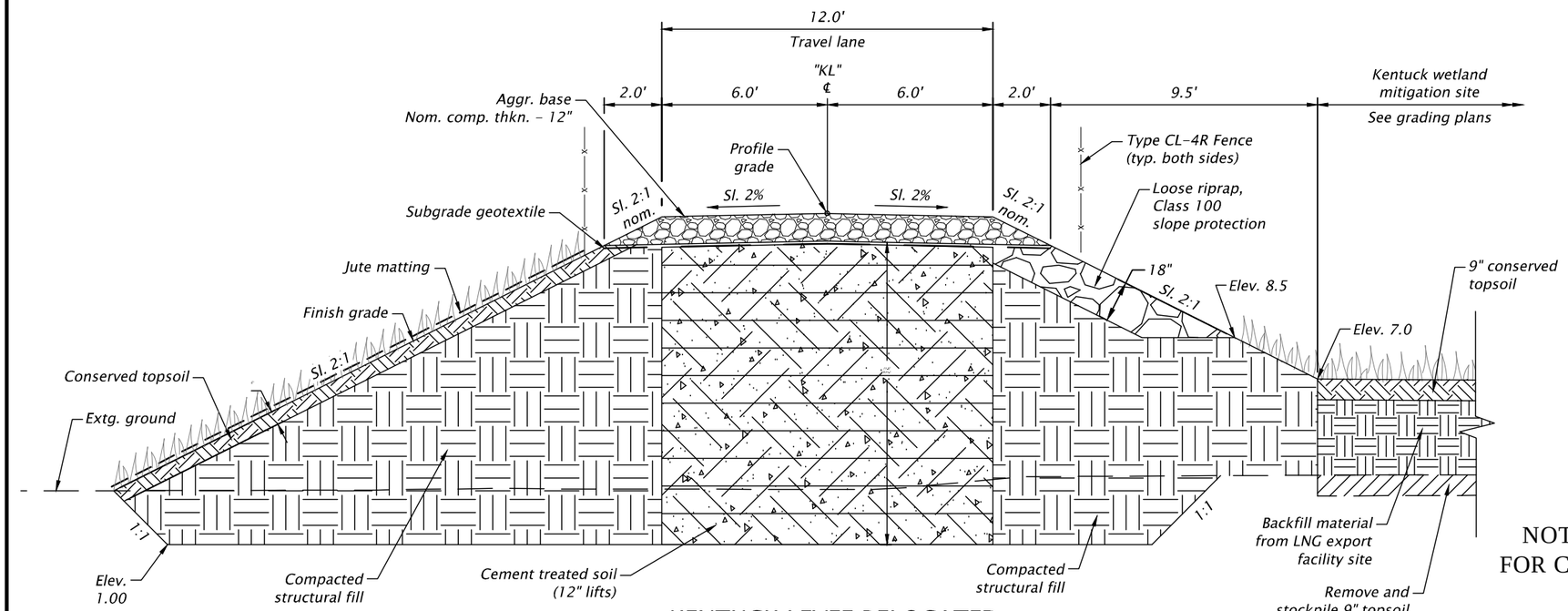
MITIGATION AREA AND WETLAND IMPACTS

SHEET NO. FIG 8B

C:\pw_work\jordan_cove_lng\jxc\dms02488\Kentuck_Mitigation Area & Wetland Impacts_Exhibit 9/26/2017 9:48 AM Jim Culpepper



KENTUCK LEVEE ADJACENT TO EXISTING LEVEE



KENTUCK LEVEE RELOCATED

Notes:

-Final levee foundation design to be determined per additional geotehcnical investigations

-Bioengineering approaches to improve habitat conditions along levee face and road embankments internal to Kentuck Project to be reviewed as part of final design (See Figure 10D for example concepts).

-DRAFT-
NOT TO BE USED
FOR CONSTRUCTION

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2100 SW River Parkway
Portland Oregon 97201
Phone: 503.223.6663

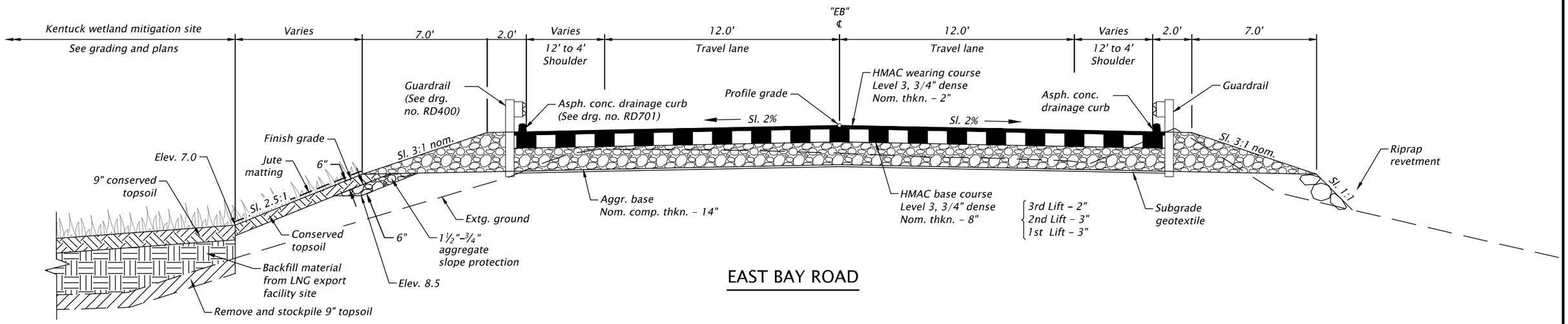
JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

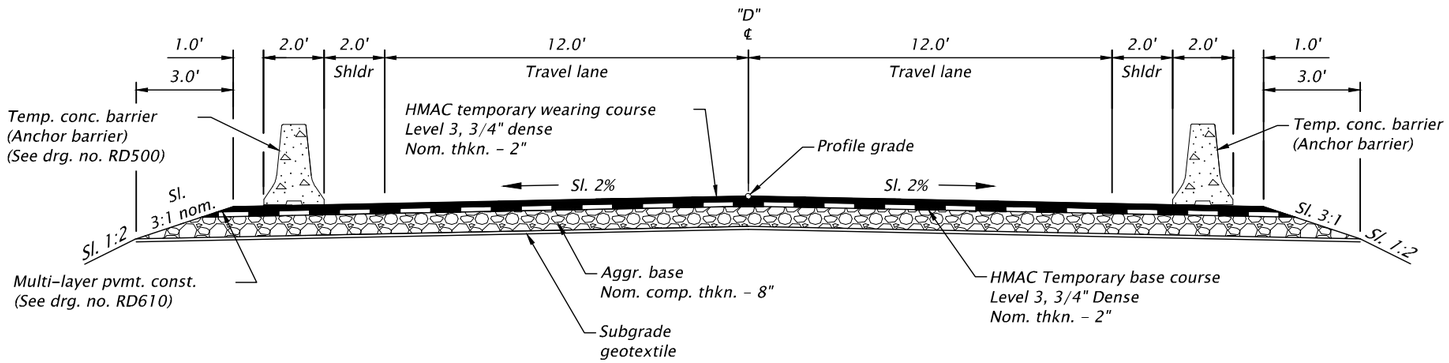
Designer: D. Iliyn	Review: G. Oien
Drafter: J. Culpepper	Checker: CHECKED_BY

TYPICAL SECTIONS

SHEET NO.
FIG 9A



EAST BAY ROAD



EAST BAY ROAD DETOUR

Notes:

-Bioengineering approaches to improve habitat conditions along levee face and road embankments internal to Kentuck Project to be reviewed as part of final design (See Figure 10D for example concepts).

-DRAFT-
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FOR CONSTRUCTION

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2100 SW River Parkway
Portland Oregon 97201
Phone: 503.223.6663

JORDAN COVE ENERGY PROJECT
KENTUCK PROJECT SITE

COOS COUNTY

Designer: D. Iliyn | Review: G. Oien
Drafter: J. Culpepper | Checker: CHECKED_BY

TYPICAL SECTIONS | SHEET NO. FIG 9B

J1-000-RGL-PMT-DEA-00005-00 Rev A

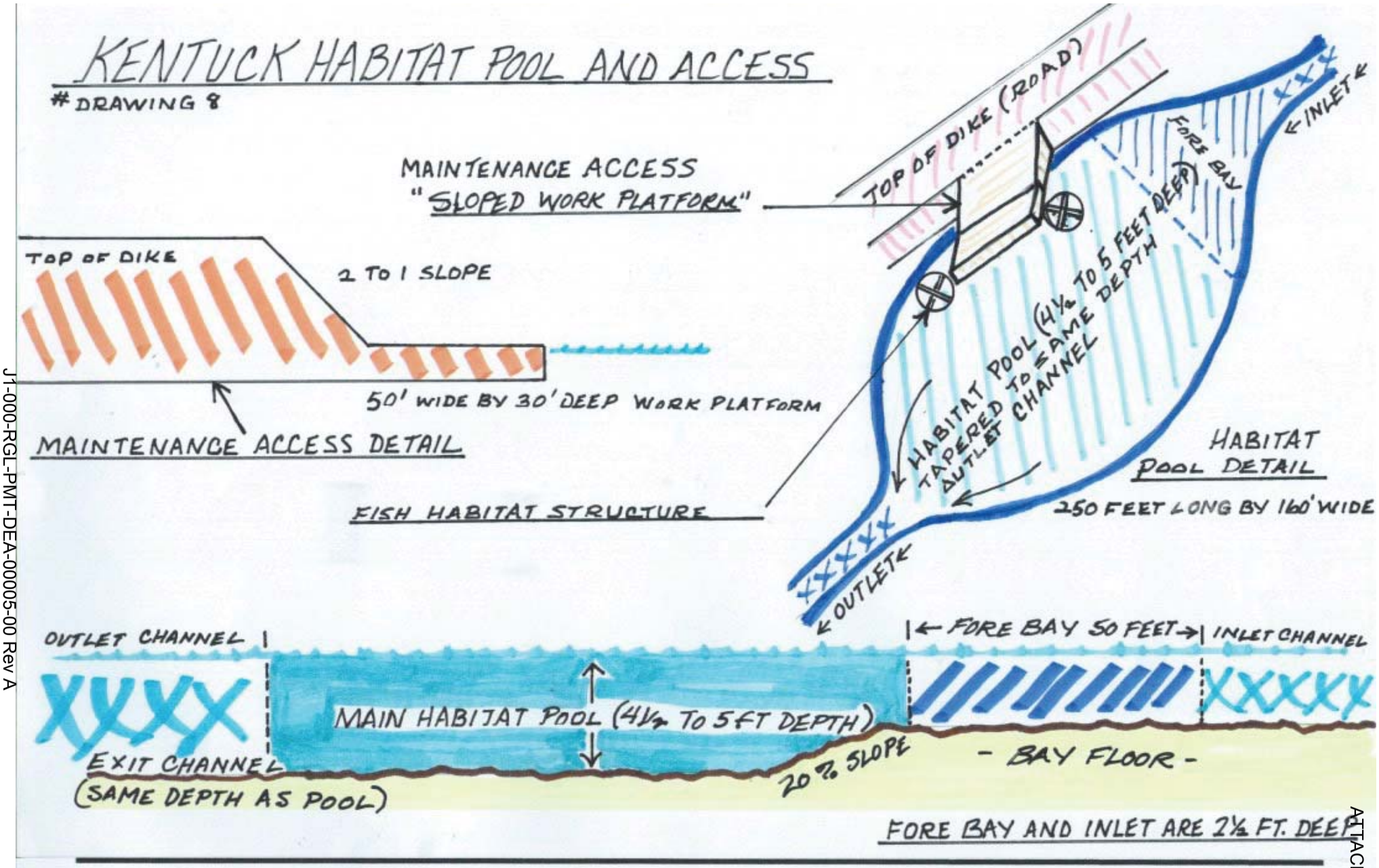
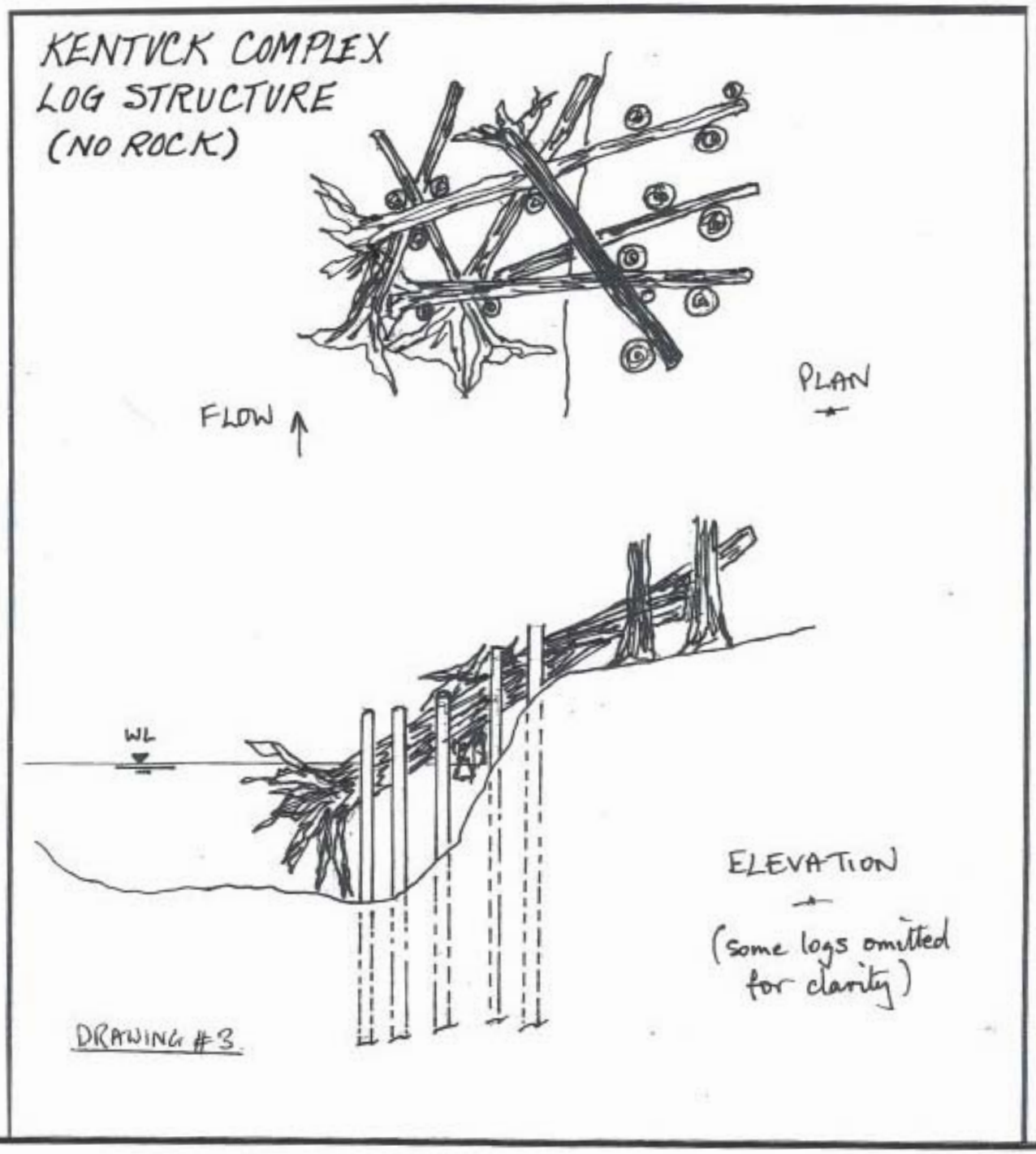


Figure 10A
Kentuck Project Site
Habitat Pool Concept

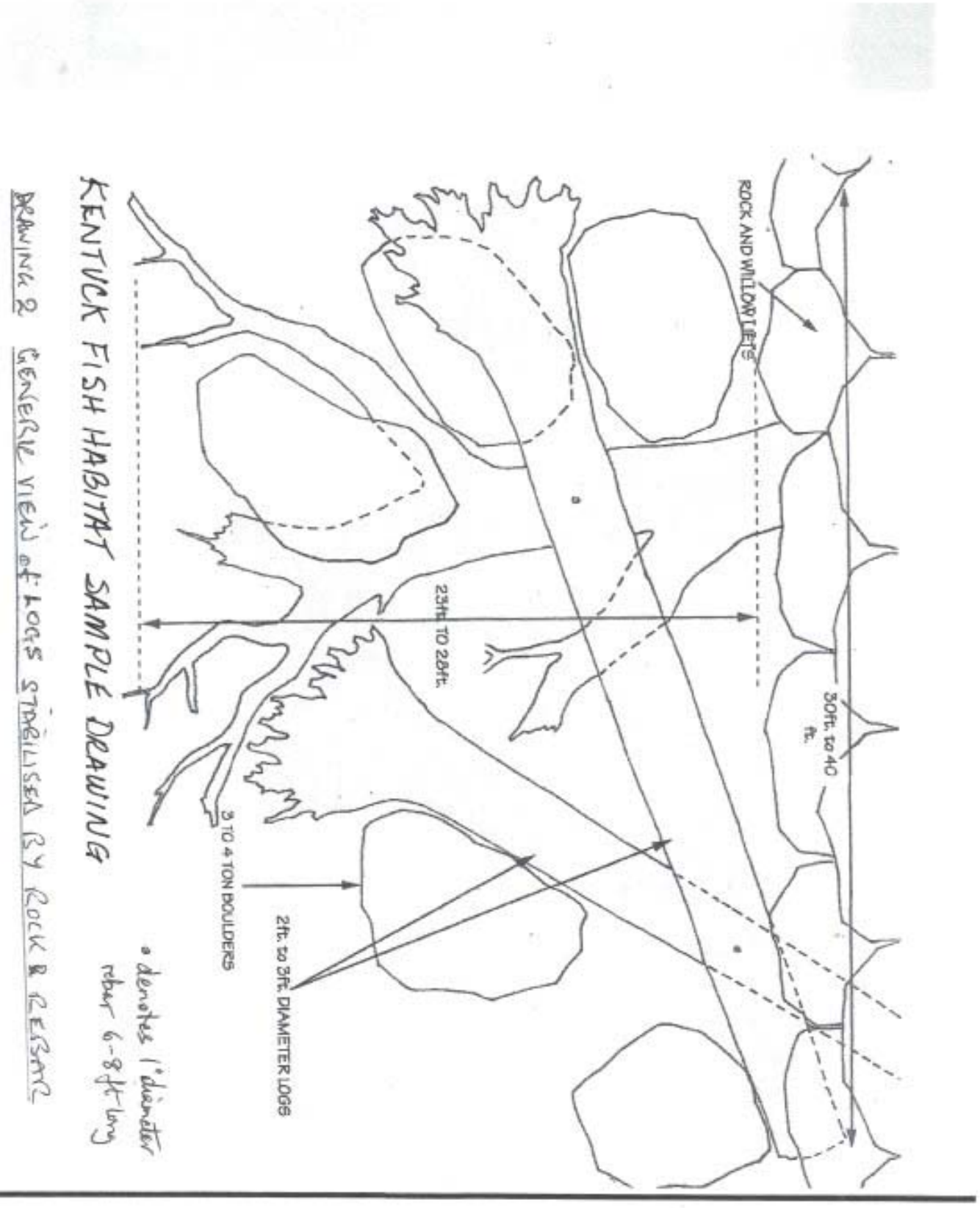
River Docs
P.O. Box 5924, Charleston, Oregon 97420
By: Dr. John L. Gardiner MBE, PE, for River Docs, Llc

ATTACHMENT: B



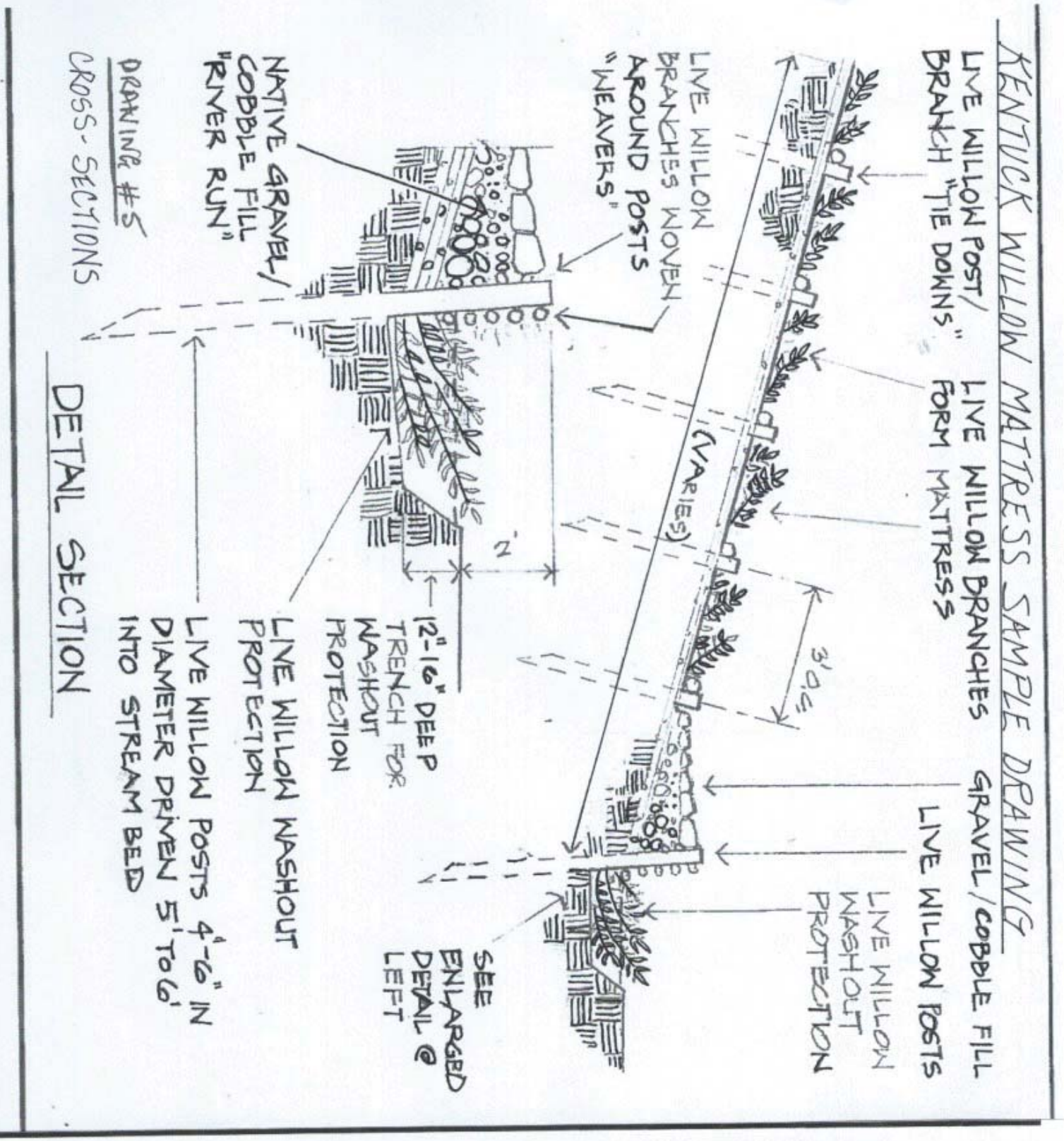
River Docs
P.O. Box 5924, Charleston, Oregon 97420
By: Dr. John L. Gardiner MBE, PE, for River Docs, Llc.

Figure 10B
Kentuck Project Site
Complex Log Structure Concept



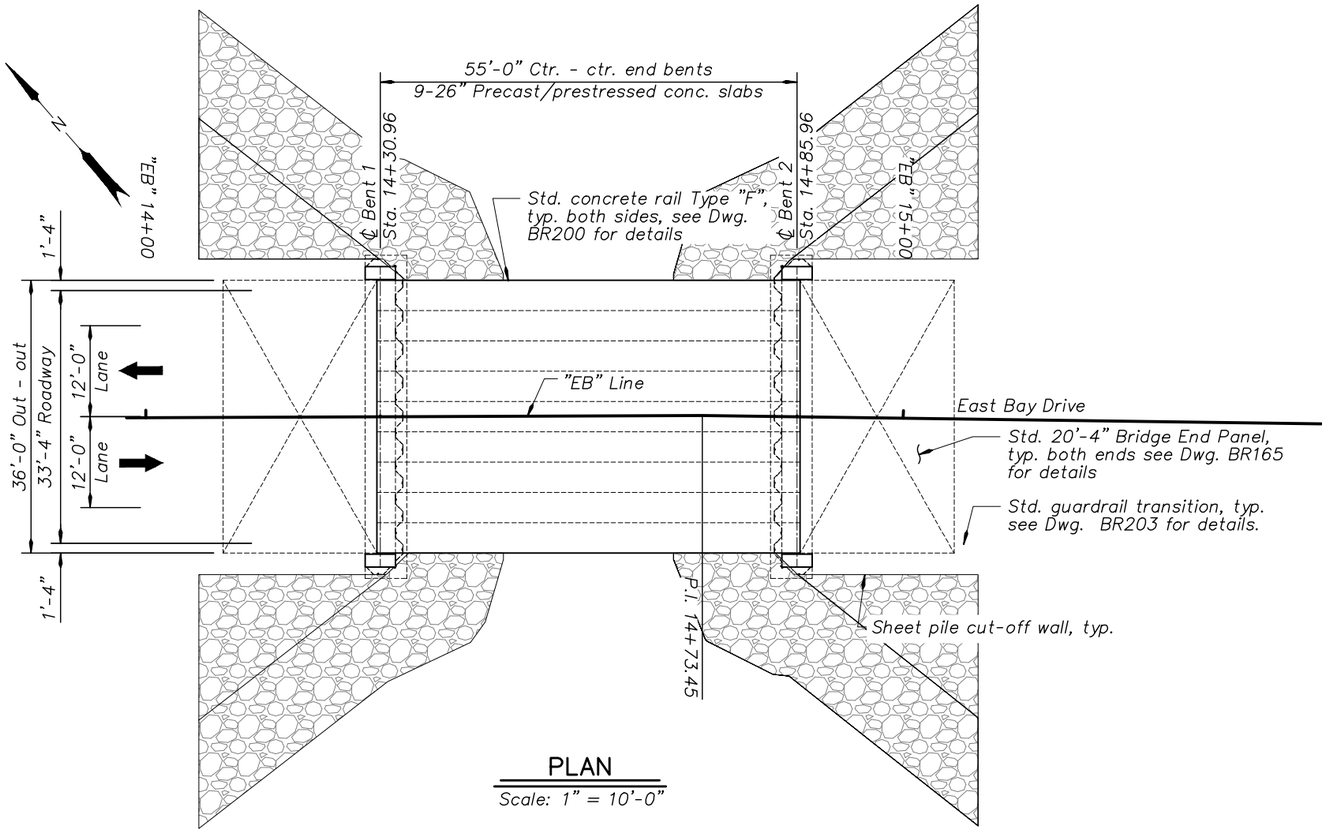
River Docs
P.O. Box 5924, Charleston, Oregon 97420
By: Dr. John L. Gardiner MBE, PE, for River Docs, Llc.

Figure 10C
Kentuck Project Site
Complex Log Structure Concept



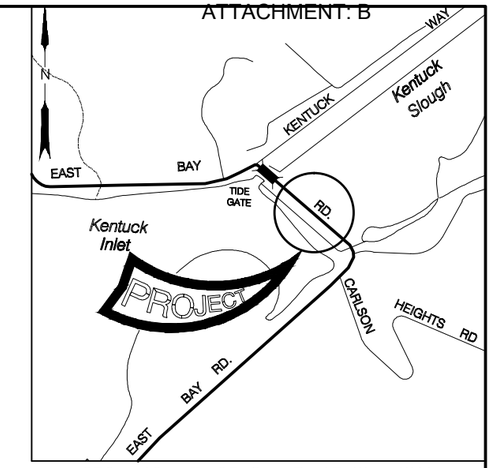
River Docs
P.O. Box 5924, Charleston, Oregon 97420
By: Dr. John L. Gardiner MBE, PE, for River Docs, Llc.

Figure 10D
Kentuck Project Site
Bioengineered Slope Concept



PLAN

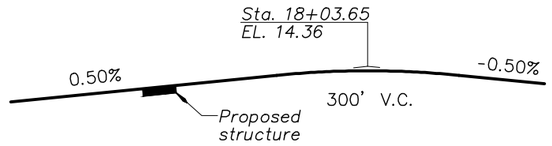
Scale: 1" = 10'-0"



SEC. 12, T. 25 S., R. 13 W., W.M.

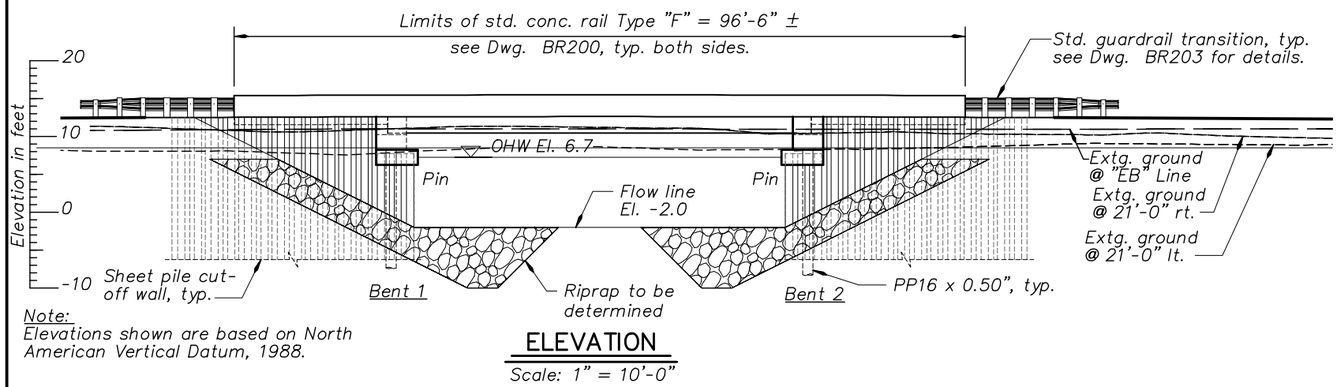
LOCATION MAP

No Scale



GRADELINE DIAGRAM

No Scale



Note:
Elevations shown are based on North American Vertical Datum, 1988.

ELEVATION

Scale: 1" = 10'-0"

NOT TO BE USED FOR CONSTRUCTION

DATE	REVIEW PLANS	BY
	Sep 26, 2017 DO NOT SCALE DO NOT USE FOR CONSTRUCTION	

ACCOMPANIED BY DWGS. B702 - B706, BR165, BR200, BR203, BR420, BR445

DRAFTER: Jim Culpepper
DESIGNER: Laura Baughman
CHECKER: Anthony Calcagno
REVIEWER: Terry Stones

FOR REVIEW
EXPIRES: .....

SCALE WARNING
If scale bar doesn't measure one inch then drawing is not to scale

DAVID EVANS AND ASSOCIATES INC.
530 Center Street N.E., Suite 605
Salem Oregon 97301
Phone: 503.361.8635

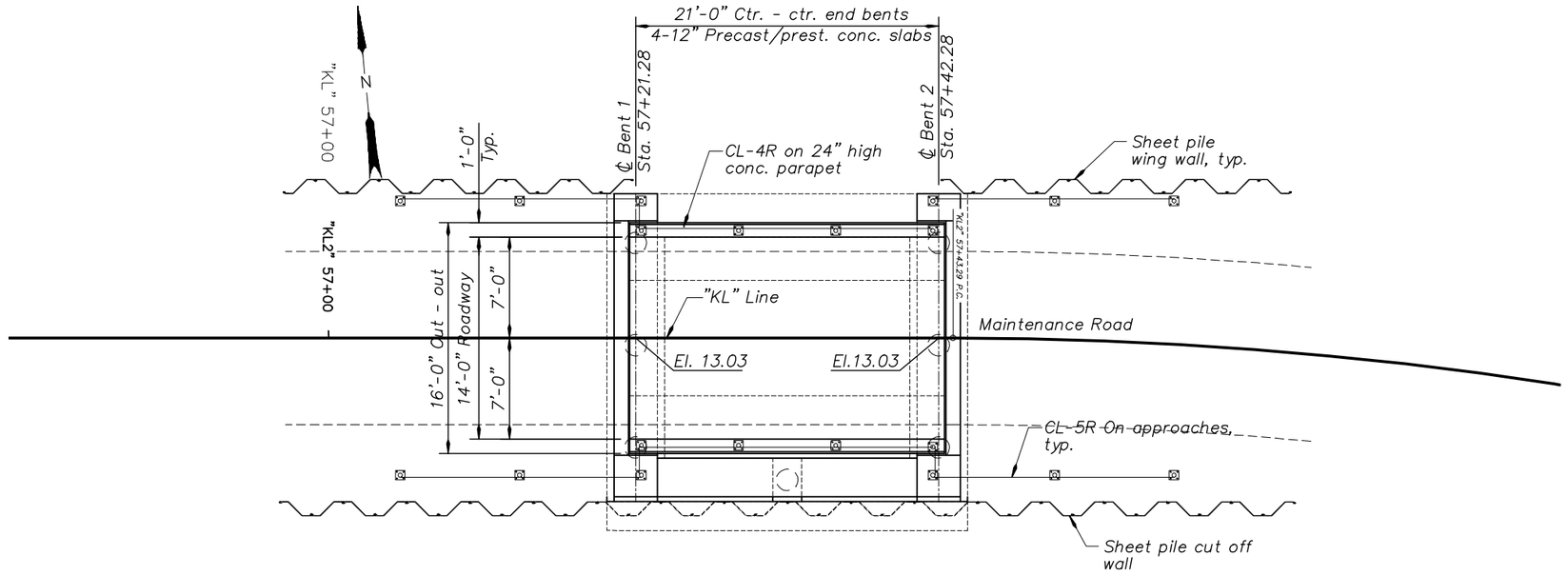
STRUCTURE NO. XXXXX
DATE Month 2014
CALC. BOOK -----

EAST BAY DRIVE BRIDGE
JORDAN COVE ENERGY PROJECT
KENTUCK MITIGATION SITE

PROPOSED EAST BAY BRIDGE - PLAN AND ELEVATION

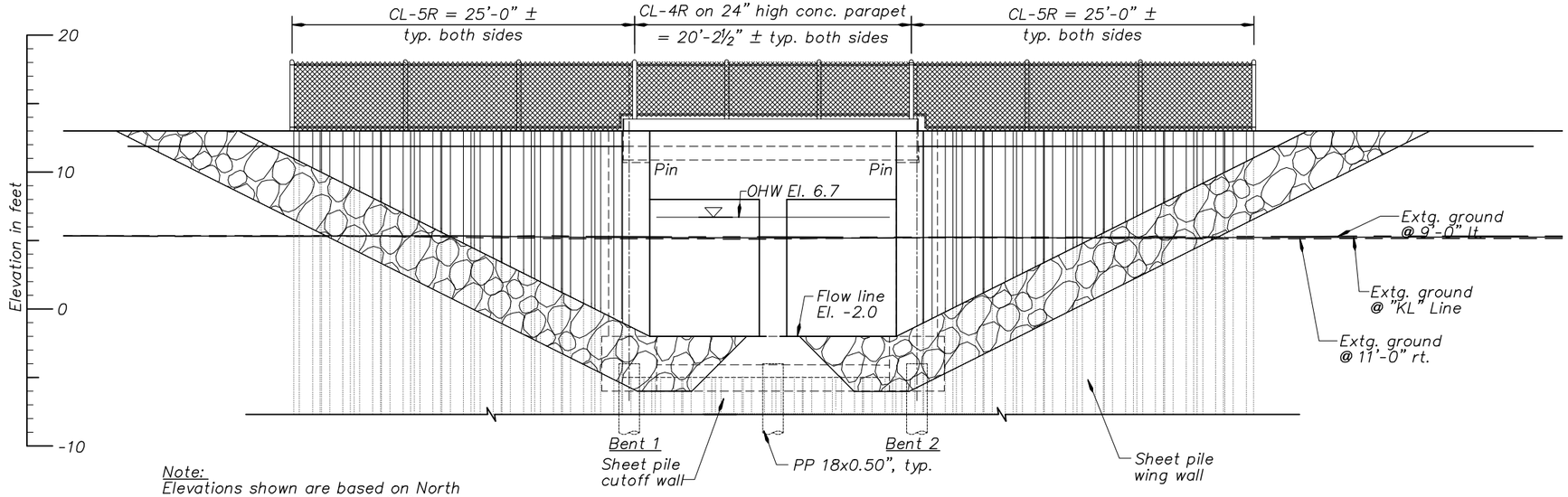
FIG 11A

DRAWING NO. B701



PLAN

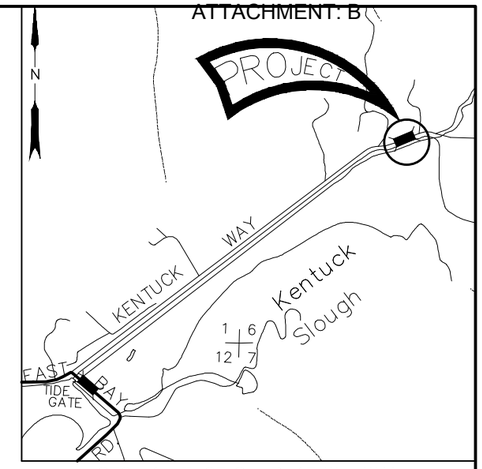
Scale: 1" = 5'-0"



Note:
Elevations shown are based on North American Vertical Datum, 1988.

ELEVATION

Scale: 1" = 5'-0"



SEC. 1, T. 25 S., R. 13 W., W.M.

LOCATION MAP

No Scale

Sta. "KL" 11+25.91
El. 13.00
-0.00%
Sta. "KL" 74+98.13
El. 13.00

Note:
Gradeline is top of aggregate wearing surface at centerline maintenance road.

GRADELINE DIAGRAM

No Scale

NOT TO BE USED FOR CONSTRUCTION

DATE	REVIEW PLANS	BY
	Sep 26, 2017 DO NOT SCALE DO NOT USE FOR CONSTRUCTION	

ACCOMPANIED BY DWGS. B802 - B805, BR240, BR400

DRAFTER: Jim Culpepper
DESIGNER: Jason Stroud
CHECKER: Anthony Calcagno
REVIEWER: Terry Stones

FOR REVIEW
EXPIRES:

SCALE WARNING
If scale bar doesn't measure one inch then drawing is not to scale

DAVID EVANS AND ASSOCIATES INC.
530 Center Street N.E., Suite 605
Salem Oregon 97301
Phone: 503.361.8635

STRUCTURE NO. XXXXX
DATE Month 2014
CALC. BOOK -----

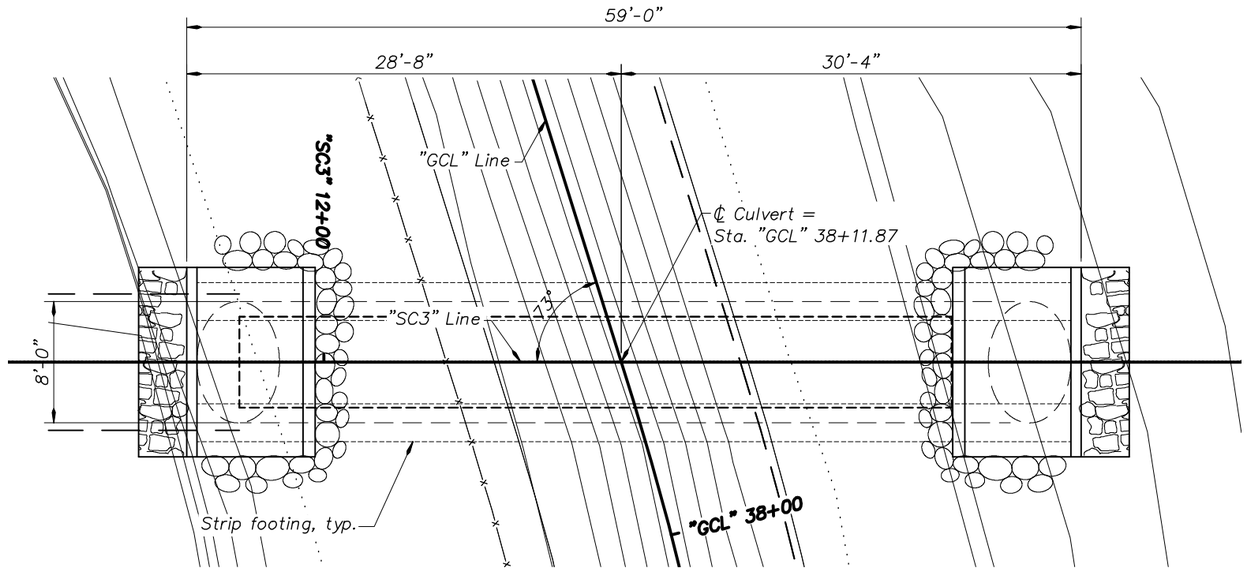
KENTUCK SLOUGH DIKE BRIDGE
JORDAN COVE ENERGY PROJECT
KENTUCK MITIGATION SITE

PROPOSED BRIDGE AND MTR - PLAN AND ELEVATION

FIG 11B

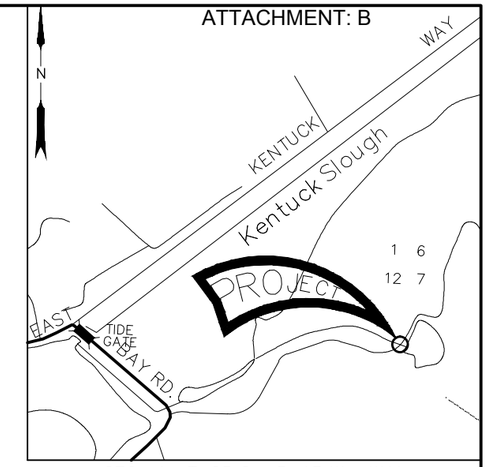
DRAWING NO. B801

ATTACHMENT: B



PLAN

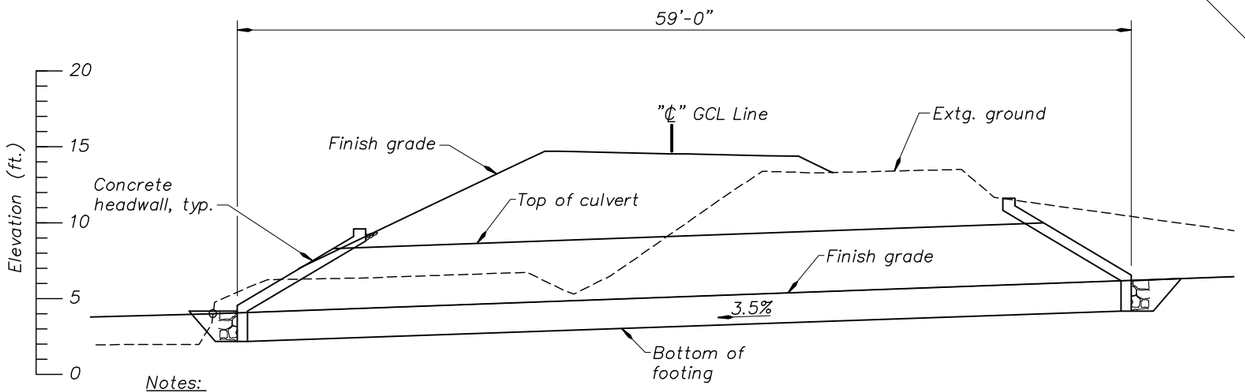
Scale: 1" = 5'-0"



SEC. 1, T. 25 S., R. 13 W., W.M.

LOCATION MAP

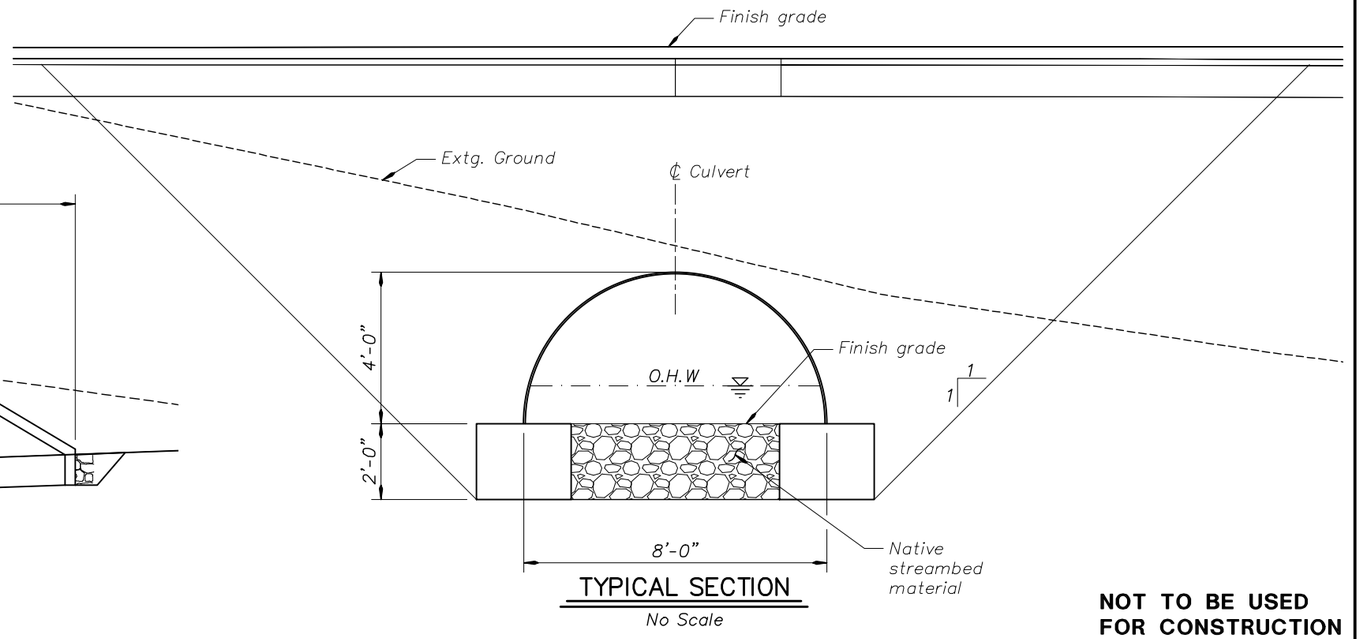
No Scale



Notes:
Elevations are based on North American Vertical Datum 1988 (NAVD88).

ELEVATION

Scale: 1" = 5'-0"



TYPICAL SECTION

No Scale

NOT TO BE USED FOR CONSTRUCTION

DATE	REVIEW PLANS Sep 26, 2017 DO NOT SCALE DO NOT USE FOR CONSTRUCTION	BY	
ACCOMPANIED BY DWGS.			

DRAFTER: Jim Culpepper
DESIGNER: Laura Baughman
CHECKER: Anthony Calcagno
REVIEWER: Terry Stones

FOR REVIEW

EXPIRES:

SCALE WARNING
If scale bar doesn't measure one inch then drawing is not to scale

DAVID EVANS AND ASSOCIATES INC.
530 Center Street N.E., Suite 605
Salem Oregon 97301
Phone: 503.361.8635

STRUCTURE NO. XXXXX
DATE Month 2014
CALC. BOOK -----

GOLF COURSE LANE CULVERT
JORDAN COVE ENERGY PROJECT
KENTUCK MITIGATION SITE

PROPOSED BRIDGE AND MTR - PLAN AND ELEVATION

FIG 11C

DRAWING NO. B801

c:\pw_work\jordan_cove_lng\jxc\dms02490\GOLF COURSE LANE_PE01.dwg 9/26/2017 9:56 AM

Rotation: 0° Scale: 1:1

J1-000-RGL-PMT-DEA-00005-00 Rev A

APPENDIX B: PIPELINE PERMANENT WETLAND IMPACTS BY WATERSHED

Pacific Connector Gas Pipeline Project Permanent Wetland Type Conversion Impacts

County	Watershed (HUC 10)	Wetland Name	Milepost	Cowardian Classification	CL Crossing Length (Feet)	Permanent Wetland Type Conversion (Acres)
Coos	Coos Bay-Frontal Pacific Ocean (1710030403)	APC-C2	1.16	PSS1R	15.0	< 0.01
		EE-WW-9902	1.22	PSSC	53.9	0.01
		W1-02	6.47	PFO	98.1	0.07
					Watershed Total	**0.08**
	North Fork Coquille River (1710030504)	WW-222-009 (CW-10)	23.38	PFOC	173.7	0.12
					Watershed Total	**0.12**
					Coos County Total	**0.20**
Douglas	Middle Fork Coquille River (1710030501)	W3-01 (BW-38 (MOD))	46.56	PFO1	39.4	0.03
					Watershed Total	**0.03**
	Olalla Creek-Lookingglass Creek (1710030212)	BW-160	56.75	PFOC	86.6	0.06
		BW-162	56.83	PFO/PEMC	28.2	0.02
		DA-15	56.69	PFO	415.8	0.29
					Watershed Total	**0.37**
	Upper Cow Creek (1710030206)	WW-111-001	109.17	PSS	11.0	<0.01
		WW-111-001 (GW-14 (FS-HF-C))	109.15		36.2	0.01
					Watershed Total	**0.01**
					Douglas County Total	**0.41**

Pacific Connector Gas Pipeline Project Permanent Wetland Type Conversion Impacts

County	Watershed (HUC 10)	Wetland Name	Milepost	Cowardian Classification	CL Crossing Length (Feet)	Permanent Wetland Type Conversion (Acres)
Jackson	Big Butte Creek (1710030704)	AW-244	130.83	PSSC	125.5	0.03
		R5-02 (AW-264 (MOD))	132.770.09+	PFO	15.9	0.01
					18.3	0.01
		R5-05 (AW-239)	133.92	PSSC	159.2	0.04
	Watershed Total					0.09
	Little Butte Creek (1710030708)	EW-63	145.55	PEMC/PSSC	1.7	<0.01
	Watershed Total					<0.01
	Jackson County Total					**0.09**
Klamath	Spencer Creek (1801020601)	WW-001-013 (EW-85)	171.06	PFO/PSS	63.9	0.04
					83.4	0.06
		WW-502-EW-103 (EW-103 (MOD))	177.76	PEMC/PSSC	115.7	0.03
	Watershed Total					**0.13**
	Klamath County Total					**0.13**
PCGP Project Total						**0.83**

APPENDIX C: LNG TERMINAL WETLAND FUNCTIONAL ASSESSMENT

TECHNICAL MEMORANDUM

DATE:	September 27, 2017
ATTENTION:	Caroline Burda, Senior Environmental Specialist
COMPANY:	Jordan Cove LNG
ADDRESS:	5615 Kirby Drive, Suite 500
FROM:	Ethan Rosenthal
SUBJECT:	Jordan Cove Energy Project Wetland Functional Assessment
DEA PROJECT NAME:	Jordan Cove LNG
DEA PROJECT NO:	JLNG0000-0003
DOCUMENT #	J1-000-TEC-TNT-DEA-00020-00
COPIES TO:	DEA File

1. INTRODUCTION

This memorandum provides the results of wetland functional assessments conducted for the Jordan Cove Energy Project ("JCEP Project") permitting effort. Wetland functional assessments were conducted for wetlands, including estuarine resources, located within the JCEP Project study area that will experience permanent impacts. The areas of the JCEP Project that will experience permanent wetland or estuarine resource impacts include: Ingram Yard, slip and access channel, Material Offloading Facility, South Dunes site, and the Trans Pacific Parkway/U.S. Highway 101 Intersection Widening. Functions and values were also assessed at the Kentuck Project mitigation site and the Eelgrass Mitigation site, both for the existing pre-mitigation condition and the designed post-mitigation condition. This memorandum is intended to provide the wetland functional assessment results. A discussion of project impacts, including avoidance and minimization measures, is provided in the permit application submittals to the U.S. Army Corps of Engineers ("USACE") and the Oregon Department of State Lands ("DSL").

2. METHODS

Wetland functions and values were evaluated for impacted wetlands and the mitigation sites pre- and post-mitigation. Table 1 lists the assessment methods used for various aspects of the project.

Table 1. Functional Assessment Methods Used for JCEP Permanent Wetland and Estuarine Impacts

Project and Components	Method: Rationale
Freshwater wetland impacts	Oregon Rapid Wetland Assessment Protocol ("ORWAP"): This is the approved method for assessing functions and values in Oregon, particularly for projects that entail multiple wetland types.
Existing tidal habitats and Eelgrass Mitigation site (intertidal sand/mudflats, shallow subtidal, eelgrass, salt marsh, riprap embankment below highest measured tide)	Best Professional Judgement ("BPJ"): BPJ entails the review of functions and values based on the knowledge and experience of a trained professional, as opposed to a more formulaic/model driven approach such as ORWAP. The habitats assessed using BPJ occur at the proposed slip and access channel, the Trans Pacific Parkway/US Highway 101 intersection, along the west side of East Bay Drive at the Kentuck Project, and at the Eelgrass Mitigation site. ORWAP is not intended to assess these types of estuarine resources, with the exception of salt marsh. Because impacts to salt marsh habitats are extremely small (0.06 acre) and are adjacent to the other habitats noted above, they have been included in this method due to their *de minimis* function relative to the surrounding impacted habitats.
Kentuck Project, pre- and post-mitigation	ORWAP: This method is appropriate for evaluating all wetland types at the site in its existing condition. This method also covers the many wetland types that will exist post-mitigation. ORWAP does consider the presence of mudflats within the greater vegetated portion of a site. Therefore, mudflats that will form at the site have been included as a part of the overall site assessment. Post-mitigation conditions were assessed seperately for the two Kentuck Project areas: Tidal Reconnection Area and Freshwater Floodplain Reconnection Area. These areas were evaluated seperately since the sources of hydrology—tidal and non-tidal—are distinctly different. However, each assessment of post-mitigation condition assumed that the other mitigation site was in place and therefore adjacent conditions would improve functions within the assessed area.

2.1 OREGON RAPID WETLAND ASSESSMENT PROTOCOL METHOD AND SPECIAL CONSIDERATIONS

ORWAP is a standardized protocol for assessing the functions and values of wetlands in Oregon. DSL led its development with funding from the U.S. Environmental Protection Agency and oversight by an advisory committee of state and federal agencies and private consultants. ORWAP outputs, like those of other methods, are not necessarily more accurate than judgments of a subject expert, partly because ORWAP spreadsheet models lack the intuitiveness and integrative skills of an actual person knowledgeable of a particular function, and models cannot anticipate every possible condition that may occur in nature (Adamus et al. 2016a).

The procedure for using ORWAP involves several steps. After data from the three-part form are entered into an Excel spreadsheet, ORWAP automatically generates scores intended to reflect the ability of a wetland to support the following functions: Water Storage and Delay, Sediment Retention and Stabilization, Phosphorus Retention, Nitrate Removal and Retention; Anadromous Fish Habitat; Resident Fish Habitat; Amphibian and Reptile Habitat; Waterbird Nesting Habitat; Waterbird Feeding Habitat; Aquatic Invertebrate Habitat; Songbird, Raptor, and Mammal Habitat; Water Cooling; Native Plant Diversity; Pollinator Habitat; Organic Nutrient Export; and Carbon Sequestration (Adamus et al. 2016a). For all but two of these functions, scores are given for both components of an ecosystem service: function and value (the Function Rating and the Value Rating, respectively). The functions are also condensed into thematic groups, called "grouped services." Grouped services ratings are what are required for regulatory use and include the following: Hydrologic Function, Water Quality Support, Fish Habitat, Aquatic Habitat, and Ecosystem Support. The individual functions are given a numeric score, while the grouped services are simply rated as "lower," "moderate," or "higher." If the function is completely absent, then a "zero" score is assigned. A "zero" score also may be assigned if the score ranked among the lowest of all wetlands in Oregon. The grouped rating is based on the highest scoring individual function within the particular group. ORWAP version 3.1 calculator spreadsheets, databases, and forms (Adamus et. al. 2016b) were used to conduct the wetland functional assessment for the JCEP permitting effort.

2.1.1 Special Consideration: Anadromous Fish Function

During implementation of ORWAP on portions of the project wetlands, it was observed that the ORWAP model sometimes greatly overstated the benefits to anadromous fish. The model does not have a simple question such as, "Do anadromous fish have access to the wetland?" Instead, the model attempts to get at this question indirectly through a series of related questions that don't take into account wetlands that might drain to anadromous fish-bearing waters via a non-fish-friendly tidegate or where a drainage connection might occur down a steep embankment that blocks fish passage. According to direction from DSL (Hicks pers. comm. 2017), when this issue arises it should be noted on the ORWAP cover sheet form and results can be manually adjusted. Because the ORWAP form is locked, it is not possible to adjust scores directly in the form, so these adjustments show up only in the attached summary table. The results section below notes any cases in which these adjustments apply in the assessment of project wetlands.

2.1.2 Special Consideration: Hydrologic and Water Quality Functions

ORWAP typically assigns Function Ratings for depressional wetlands lacking an outlet as "higher" for Hydrologic Function and Water Quality Support scores, regardless of any other characteristics of the wetland. The model essentially assumes that all water flowing in, including any pollutants, is trapped and therefore the wetland reduces downstream flooding, and pollutants cannot impact downstream waters. The scoring of these functions for project depressional wetlands followed this pattern. However, the value ratings of these functions for project wetlands generally rated "lower" or "moderate," presumably because the wetlands are quite small and located in the low end of the watershed, which means the functions are of relatively little benefit in these instances. The wetland characterization and results section below notes cases in which this situation applies to project wetlands.

3. WETLAND CHARACTERIZATION AND RESULTS

Wetlands requiring functional assessments are described below. These descriptions are intended to provide a general picture of the assessed wetlands as context for the more detailed assessment questions required by ORWAP or to provide the discussion of functions for resources in which BPJ was used to assess functions. ORWAP functional scores are summarized in the attached summary table. ORWAP cover pages and detailed score sheets for each assessment are provided as an attachment after the summary table. Detailed assessment worksheet forms, roughly 30 pages per assessed wetland, are available upon request.

3.1 IMPACTED WETLANDS

3.1.1 Wetlands 2013-6 and 2012-2 (Assessed Using ORWAP)

Wetlands 2013-6 and 2012-2 are interdunal emergent wetlands situated at a transition zone between generally less developed dune lands to the west and more disturbed developed areas to the east. The nearest source of disturbance to the wetland is Jordan Cove Road, which runs nearly adjacent to the east side of the wetlands. The wetlands have no surface outlet and are primarily fed by groundwater. Much of the wetlands are ponded year-round, ranging from up to 3 feet deep in the deeper areas during winter to just a few inches deep during summer. Wetland vegetation primarily consists of native emergent species, with some willow shrubs around the edges of the wetlands. The wetlands are bordered by coastal dune forest; however, as previously noted, Jordan Cove Road is close to the eastern boundary of the wetlands. A large expanse of sand dune, coastal dune forest, and wetlands are located to the west of the wetlands.

Notable findings from ORWAP include:

- Group scores that rated as "higher" for both the Function Rating and the Value Rating include: Aquatic Habitat and Ecosystem Support. The "higher" rating for Aquatic Habitat and Ecosystem Support make intuitive sense, because these wetlands are fairly intact and are bordered by other intact habitats.
- As noted in the methods section, Hydrologic Function and Water Quality Support function scores rated as "higher" solely because these wetlands have no outlet. However, the Value Rating for both of these functions was "lower."
- The wetlands are not accessible to fish and likely do not have resident fish. ORWAP rated the Fish Habitat function as "lower"; however, this score was manually adjusted to zero in the attached summary table.

3.1.2 Wetland C (Assessed Using ORWAP)

Wetland C is a relatively small depressional forested wetland dominated by native plant species typical of the Oregon coast. The wetland is close to the shoreline of the geographic feature known as Jordan Cove. The surrounding area consists of second growth forest, a grassed access road, Jordan Cove Road farther to the west, and cleared historic industrial land farther to the east. The wetland has no surface outlet and is primarily fed by groundwater. Minor ponding likely occurs in winter, and the wetland dries out in summer.

Notable findings from ORWAP include:

- Findings for Wetland C at the group level are essentially the same as those noted for Wetlands 2013-6 and 2012-2; see findings above.

3.1.3 Wetland E (Assessed Using ORWAP)

Wetland E is a deep depressional wetland dominated solely by yellow pond lily (*Nuphar luteum*). Ponding occurs throughout the year across the entirety of the wetland, with water surface elevations dropping roughly 2 to 3 feet from winter to summer. Yellow pond lily covers most of the water surface by summer; only a few small open water areas remain. The surrounding area consists of second growth forest, a grassed access road, Jordan Cove Road farther to the west, and cleared historical industrial land farther to the east. The wetland has no surface outlet and is primarily fed by groundwater.

Notable findings from ORWAP include:

- Findings for Wetland C at the group level are essentially the same as those noted for Wetlands 2013-6 and 2012-2; see findings above.
- One exception to the similarity in findings is that the Fish Habitat function was not manually decreased from "lower" to zero for Wetland E, because this wetland contains a persistent source of ponded water that is several feet deep. Although it is not known if resident fish are present, it appears more likely that they are present at Wetland E than at Wetlands 2013-6 and 2012-2.

3.1.4 Wetlands H, I, J, and N (Assessed Using ORWAP)

Wetlands H, I, J, and N are all located in highly disturbed areas of the former Weyerhaeuser Mill property, now referred to as the South Dunes site. These wetlands consist of constructed drainage ditches and some flat wetland areas drained by the ditches. Vegetation is primarily a mix of native emergent and non-native grasses; however, some fringing willows might also be present. Surrounding areas consist of old concrete fill pads, and grass and shrub uplands dominated by non-native species that are occasionally maintained. Although these wetlands might drain to the bay, particularly during wetter months or high precipitation events, there is no fish access either because of fish-impassable culverts (i.e., tide gates or culvert elevation) or because the ditch bottoms are well above the elevation of high tides and outlet drainage spills over a steep embankment.

Notable findings from ORWAP include:

- No group functions rated as "high" for these wetlands, because all of these wetlands are situated in highly disturbed areas associated with past industrial activities. Non-native vegetation dominates these wetlands as well as the surrounding buffer areas. Some group functions did rate as "moderate"; however, this rating is most likely a result of more natural conditions farther afield, including relative proximity to the Coos Bay estuary.
- These wetlands are not accessible to fish, nor would they provide habitat to fish if access were provided. ORWAP rated the Fish Habitat function as "lower"; however, this score was manually adjusted to zero in the attached summary table.

3.1.5 Estuarine Resources at Proposed Access Channel (Assessed Using BPJ)

Permanently impacted estuarine resources at the proposed access channel consist mostly of unvegetated intertidal sand/mudflat, unvegetated shallow subtidal habitat, narrow bands of eelgrass along the intertidal/subtidal boundary, and a very small patch (<0.1 acre) of salt marsh vegetation. The habitats provide similar functions to one another; however, the salt marsh and eelgrass habitats tend to provide these functions to a greater extent. Flats habitats support algae and a variety of benthic invertebrates. These habitats are generally sheltered from strong currents and wave action, and their gradual slopes tend to dissipate wave and tidal energies. Sediment deposition and tidal/wave action are important factors that help develop and shape flats habitat. Tidal flat sediments vary from fine mud to cobbles. Sediments at the access channel range from course sand to mud. Shallow water depths allow for maximum light and warm temperatures, which may result in extensive algae blooms in the spring and summer. Diatoms are a very common type of algae that are distributed throughout the lower bay and contribute significantly to estuarine primary production. Mudflats and sand flats provide habitat to various shellfish species and ghost shrimp. Bottom-feeding fishes graze over flats during high tide. Flats habitats are important to juvenile salmonids, because they provide suitable substrate conditions to support primary productivity (benthic algae) and prey species (benthic macroinvertebrates). Eelgrass beds further support primary productivity, act as substrate and structure for epiphytic (attached) algae and other aquatic organisms, and provide important cover for juvenile fish. Herring and other aquatic organisms attach their eggs to eelgrass. Intertidal flats also provide feeding areas for waterfowl, shorebirds, and raptor species such as osprey. The habitats at the proposed access channel could provide all of these functions; however, likely not at a level as high as some of the more diverse and ecologically complex locations found elsewhere in the bay (e.g., Clam Island area).

3.2 MITIGATION SITES

3.2.1 Kentuck Project Wetlands – Existing Conditions (Assessed Using ORWAP)

Wetlands at the Kentuck Project site primarily consist of wet pasture that now occupies the former Kentuck Golf Course. Vegetation primarily consists of non-native grasses, with scattered native and ornamental trees. Hydrology is primarily driven by a high seasonal groundwater table along with direct precipitation. Some ponding occurs during the winter months, with excessive ponding occurring after heavy and/or persistent periods of rain. Ponding is generally absent in the summer, except for a few small excavated ponds/former golf course water hazards. Several small drainages enter the site from adjacent hillsides and flow to Kentuck Inlet (i.e., Coos Bay) via a tidegated culvert into a sump on the east side of East Bay Road and then to a non-tidegated culvert under East Bay Road. The site is hydrologically isolated from Kentuck Slough (inclusive of Kentuck Creek) by a levee. Currently, the site is inaccessible to fish from the bay and Kentuck Slough. Forested wetland, dominated by typical native coastal plant species, occurs on the south side of Golf Course Lane, and is also part of the overall site. These wetland areas are fed by subsurface flow and runoff from the adjacent hillside. There is also a small dam and irrigation pond that drains to the former golf course area. Drainage is via a standpipe. The irrigation pond contains perennial open water, areas of yellow pond lily, and emergent wetland dominated by native species. Forest lands border the east side of the site, and there is a combination of timber harvest and residential dwellings further upslope.

Notable findings from ORWAP include:

- No group scores rated as "higher" for both the Function Rating and Value Rating.
- Aquatic Habitat and Ecosystem Support functions ratings were manually adjusted from "higher" to "moderate." ORWAP likely scored these as "higher" because some minor portions of the Kentuck Project site have intact habitats; however, these portions provide a poor point of comparison, because the majority of the site lacks intact native habitats and has been highly altered by past land use practices. A "moderate" rating is more appropriate for this site, because it is a former golf course that is slowly reverting back to more natural conditions but still experiences grazing and lacks overall diversity.
- ORWAP rated the Fish Habitat function as "moderate," but this score was manually adjusted to "lower" in the attached summary table. The site wetlands and associated creeks are not accessible to anadromous fish but could have resident fish. ORWAP rated the individual "Resident Fish" function as "lower."

3.2.2 Kentuck Project Wetlands – Post-mitigation, Tidal Reconnection Area (i.e., JCEP Mitigation) (Assessed Using ORWAP)

The Kentuck Site post-mitigation will contain two primary areas: one connected to tidal influence and the other not connected to tidal influence but connected to Kentuck Creek. This description covers the portion that will be connected to tidal influence and is intended to provide mitigation for the JCEP Project impacts.

After mitigation this area will consist of a combination of mudflats, salt marsh, tide channels, and fringing freshwater wetlands that will form a complex estuarine ecosystem providing a full connection and fish accessibility to and from Coos Bay. Willows are highly supportive of rearing salmonids and they will be an important component of the fringing wetland plant communities. The site will also be connected to Kentuck Slough via a muted tidal regulator (i.e., a fish-friendly tidegate structure). Hydrology will be provided primarily by tidal inundation, along with freshwater inputs from hillside seepage and incoming drainages.

Notable findings from ORWAP include:

- Group scores that rated as "higher" for both the Function Rating and Value Rating include: Water Quality Support, Fish Habitat Support, Aquatic Habitat Support, and Ecosystem Support. These high ratings make intuitive sense, because the area will be restored to a complex and diverse array of native habitat types that were historically present but have been lost in the estuary.
- The Hydrologic Function rated as "lower" for the Function Rating, likely only because the area will be a tidal wetland and therefore will not support flood control.

3.2.3 Kentuck Project Wetlands – Post-mitigation, Freshwater Floodplain Reconnection Area (i.e., PCGP Mitigation) (Assessed Using ORWAP)

The northeast end of the Kentuck Project site will be reconnected to Kentuck Creek, outside of the previously described Tidal Reconnection Area, and therefore will provide restored freshwater wetland floodplain habitat. This area will be focused on mitigation for the impacts of the Pacific Connector Gas Pipeline project ("PCGP Project"), which consist of conversion of palustrine forested and scrub-shrub wetlands to emergent wetlands. Therefore, forested and scrub-shrub wetlands are the dominant habitat types proposed for this area; however, a minor component of emergent wetland will also be provided. The existing levee that segregates Kentuck Creek from the Kentuck Project site will be removed in this area, allowing flood flows to enter the wetlands. Minor grading within the freshwater floodplain reconnection area will occur in order to provide microtopographic relief, which should allow for establishment of diverse plant communities and provide fish refugia habitat during periods of high water. Similar to the tidal portion of the Kentuck Project described above, because willows are highly supportive of rearing salmonids, they will be an important component of the plant communities.

Notable findings from ORWAP include:

- Group scores that rated as "higher" for both the Function Rating and Value Rating include: Water Quality Support, Fish Habitat Support, Aquatic Habitat Support, and Ecosystem Support. These high ratings make intuitive sense, because the area will be restored to a complex and diverse array of native habitat types along the Kentuck Creek floodplain that were historically present but have been lost.
- The Function Rating for Water Quality Support was manually increased from "moderate" to "higher," because it is assumed that the benefits of increased shade/lower water temperature and the trapping of sediments during high flows are likely underestimated by ORWAP, and will certainly be greater than the "moderate" rating ORWAP also calculated for the existing condition.
- The Value Ratings for Aquatic Habitat and Ecosystem Support functions were manually increased to "higher," because these functions are clearly valued in the watershed and because the assessment of the pre-mitigation condition rated them as "higher" value. Clearly, the improvement in site conditions should not reduce their value.

3.2.4 Eelgrass Mitigation Site – Existing Conditions (Assessed Using BPJ)

The proposed Eelgrass Mitigation site currently consists of a sand flat island situated several feet above mean lower low tide elevation. The island is exposed during lower low tides. Deeper areas surrounding the island contain eelgrass beds. Functions that are provided by sand flats and mudflats are described above in the discussion of "Estuarine Resources at Proposed Access Channel." Generally speaking, the functions provided occur at a lower level for bare sand flats than for areas with eelgrass beds. In addition, primary production and associated food chain support are lower in the bare sand flat areas than in the areas with eelgrass. The bare sand flat also lacks the substrate and structure to support epiphytic algae and other organisms that would increase primary and secondary productivity. Cover for juvenile fish is not provided.

3.2.5 Eelgrass Mitigation Site – Post-mitigation (Assessed Using BPJ)

The same functions provided pre-mitigation would be provided post-mitigation; however, these functions would be provided at a higher level. The presence of eelgrass would elevate levels of primary production and associated food chain support functions considerably. The eelgrass would also provide substrate and structure to support epiphytic algae and other organisms that would increase primary and secondary productivity. Cover for juvenile fish would be provided along with attachment sites for egg laying by herring and other aquatic organisms.

4. SUMMARY FINDINGS

Based on ORWAP, freshwater wetland group functions likely to be most affected by the JCEP Project and that received "higher" Function and Value Ratings are the Aquatic Habitat and Ecosystem Support functions. Under existing conditions, no functions at the proposed Kentuck Project mitigation site rated as "higher." On the other hand, post-mitigation Function Ratings for both the Kentuck Project Tidal Reconnection Area and the Kentuck Project Freshwater Floodplain Reconnection Area rated as "higher" for Water Quality Support, Fish Habitat, Aquatic Habitat, and Ecosystem Support, all of which received "higher" Value Ratings as well. These assessment results suggest two conclusions: first, proposed mitigation at both Kentuck Project areas results in a functional uplift of important wetland values, and second, the uplift at the Kentuck Project will occur, at a minimum, to the same "higher" Function Rating and Value Rating group functions that will be lost at the freshwater impact sites.

Estuarine habitat functions will be lost at the proposed slip location. As previously described, functions such as shellfish habitat, waterbird habitat, primary production, cover for juvenile fish, and egg laying attachment areas for herring and other aquatic organisms may be provided at this impact site; however, due to current site conditions, the impact site likely does not provide these functions at as high a level as some of the more diverse and ecologically complex locations found elsewhere in the bay. Lost estuarine functions will be offset at the Kentuck Project site and the Eelgrass Mitigation site, both of which are currently situated in and/or post-mitigation will result in a considerably more complex and diverse array of habitats than at the slip impact site, thus resulting in an overall uplift in functions.

As previously noted, this memorandum is only intended to provide the wetland functional assessment results. A discussion of project impacts, including avoidance and minimization measures, is provided in the Joint Permit Application submittal to the USACE and DSL.

5. REFERENCES

Adamus, P., J. Morlan, K. Verble. and A. Buckley. 2016b. Oregon Rapid Wetland Assessment Protocol (ORWAP, revised). Version 3.1 calculator spreadsheet, databases, and data forms. Oregon Department of State Lands, Salem, OR.

Adamus, P., K. Verble, and M. Rudenko. 2016a. Manual for the Oregon Rapid Wetland Assessment Protocol (ORWAP, revised). Version 3.1. Oregon Dept. of State Lands, Salem, OR.

Dana Hicks, DSL, personal communication, August 18, 2017.

ATTACHMENTS

- Attachment 1: ORWAP Summary Table
- Attachment 2: ORWAP Cover Pages and Summary Scores

Attachment 1: ORWAP Summary Table

ORWAP Functional Assessment Summary Results for JCEP Project

Note: Group functions where both the Function Rating and Values Rating were "higher" have been shaded in green. These Group Functions will be emphasized in the comparison of impacts to mitigation.

Impacted Wetlands

	Wetland C				Wetland E				Wetlands H, Wetland I, Wetland J, and Wetland N				Wetland 2013-6 and 2012-2			
GROUPS	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Higher	--	Lower	--	Higher	--	Lower	--	Moderate	--	Lower	--	Higher	--	Lower	--
Water Quality Support (SR, PR, or NR)	Higher	--	Moderate	--	Higher	--	Lower	--	Lower	--	Moderate	LM	Higher	--	Lower	--
Fish Habitat (FA or FR)	0 (2)	--	0 (2)	--	Lower	--	Lower	--	0 (2)	--	0 (2)	--	0 (2)	--	0 (2)	--
Aquatic Habitat (AM, WBF, or WBN)	Higher	--	Higher	--	Higher	MH	Higher	--	Moderate	--	Higher	--	Higher	MH	Higher	--
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Higher	MH	Higher	--	Higher	MH	Higher	--	Moderate	MH	Higher	--	Higher	MH	Higher	--

Kentuck Project Site, Pre- and Post-Mitigation

	Pre-Mitigation (i.e. Existing Conditions)				Post-Mitigation Tidal Reconnection Area				Post-Mitigation Freshwater Floodplain Reconnection Area			
GROUPS	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Lower	--	Lower	--	Lower	--	Lower	--	Moderate		Lower	
Water Quality Support (SR, PR, or NR)	Moderate	--	Higher	--	Higher	--	Higher	--	Higher (5)		Higher	
Fish Habitat (FA or FR)	Lower (1)	--	Higher	--	Higher	--	Higher	--	Higher		Higher	
Aquatic Habitat (AM, WBF, or WBN)	Moderate (6)	--	Higher	--	Higher	--	Higher	--	Higher	MH	Higher (4)	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Moderate (6)	MH	0 (3)	0 (3)	Higher	--	Higher	--	Higher		Higher (4)	

Notes regarding ratings, including manual adjustments to ORWAP ratings.

(1) Rating manually adjusted to "Lower" because ORWAP currently not able to account for tidegates that prevent fish passage. Note score on individual worksheet is as calculated by ORWAP (i.e. moderate).

(2) A "0" rating was manually entered because ORWAP had rated the function as "lower" when in fact no function is provided due to a total lack of access by anadromous and resident fish.

(3) A "0" rating was asigned by ORWAP because the associated highest function within the Ecosystem Support group was "Organic Nutrient Export." ORWAP does not assess the value of Organic Nutrient Export.

(4) Values scores were manually increased to "higher" since the functions are clearly valued in the watershed and because the assessment of the pre-mitigation rated them to be of high value.

(5) Function Rating manually increased from "moderate" to "higher" since it is believed that shade/temperature benefits and trapping of sediments during high flows are likely underestimated by ORWAP and will certainly be greater than the "moderate" rating ORWAP also calculated for the existing condition.

(6) Manually adjusted from "higher" to "moderate". ORWAP likely scored as "higher" because some minor portions of the Kentuck Project have intact habitats; however, this provides a poor comparison when reviewing the majority of the site that lacks intact native habitats and that have been highly altered by past land use practices.

Attachment 2: ORWAP Cover Pages and Summary Scores

ORWAP Version 3.1. Cover Page: Basic Description of Assessment	
Site Name:	Wetland C
Investigator Name:	Phil Rickus
Date of Field Assessment:	various during different times of year
County:	Coos County
Nearest Town:	North Bend
Latitude (decimal degrees):	
Longitude (decimal degrees):	43.4339, -124.2492
TRS, quarter/quarter section and tax lot(s):	
Approximate size of the Assessment Area (AA, in acres):	0.29 ac
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
If delineated, DSL file number (WD #) if known:	
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): Systems: Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E Classes: Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PEMW, PFOC
Predominant HGM Class: Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	Depressional
Soil Unit Mapped in Most of the AA:	Waldport-Heceta, fine sands, 0 to 30% slopes
If tidal, the tidal phase during most of visit:	not tidal
What percent (approximate) of the **wetland** were you able to visit?	100
What percent (approximate) of the **AA** were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	no
How many wetlands have you assessed previously using ORWAP (approximate)?	> 30
.	Relatively small depressional forested wetland dominated by natives. The surrounding area consists of second growth forest, a grassed access road, Jordan Cove Road further to the west and cleared historic industrial land further to the east. The wetland has no surface outlet and is primarily fed by groundwater. Minor ponding likely occurs in winter with the wetland drying out in summer.

Site Name:	**Wetland C**
Investigator Name:	**Phil Rickus**
Date of Field Assessment:	**various during different times of year**

Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.

Normalized Scores & Ratings for this Assessment Area (AA):

Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity
Water Storage & Delay (WS)	10.00	Higher		0.00	Lower	
Sediment Retention & Stabilization (SR)	10.00	Higher		4.85	Moderate	
Phosphorus Retention (PR)	10.00	Higher		2.27	Lower	
Nitrate Removal & Retention (NR)	10.00	Higher		1.80	Lower	
Anadromous Fish Habitat (FA)	0.00	Lower		0.00	Lower	
Resident Fish Habitat (FR)	0.00	Lower		0.00	Lower	
Amphibian & Reptile Habitat (AM)	7.40	Higher		3.47	Lower	
Waterbird Nesting Habitat (WBN)	6.64	Moderate	MH	10.00	Higher	
Waterbird Feeding Habitat (WBF)	9.03	Higher		10.00	Higher	
Aquatic Invertebrate Habitat (INV)	5.69	Moderate		2.47	Lower	
Songbird, Raptor, Mammal Habitat (SBM)	3.04	Lower		5.00	Moderate	
Water Cooling (WC)	9.41	Higher		0.00	Lower	
Native Plant Diversity (PD)	6.94	Higher	MH	10.00	Higher	
Pollinator Habitat (POL)	7.09	Higher	MH	5.77	Higher	MH
Organic Nutrient Export (OE)	0.00	Lower				
Carbon Sequestration (CS)	7.51	Higher				
Public Use & Recognition (PU)				3.16	Lower	

Other Attributes:	Score	Rating	Rating Break Proximity
Wetland Sensitivity (SEN)	3.71	Moderate	
Wetland Ecological Condition (EC)	1.92	Lower	
Wetland Stressors (STR)	2.86	Lower	

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Higher		Lower	
Water Quality Support (SR, PR, or NR)	Sediment Retention & Stabilization (SR)	Higher		Moderate	
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Lower		Lower	
Aquatic Habitat (AM, WBF, or WBN)	Waterbird Feeding Habitat (WBF)	Higher		Higher	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Native Plant Diversity (PD)	Higher	MH	Higher	

ORWAP Version 3.1. Cover Page: Basic Description of Assessment	
Site Name:	Wetland E
Investigator Name:	Ethan Rosenthal
Date of Field Assessment:	various during different times of year
County:	Coos County
Nearest Town:	North Bend
Latitude (decimal degrees):	43.4345
Longitude (decimal degrees):	-124.2482
TRS, quarter/quarter section and tax lot(s):	
Approximate size of the Assessment Area (AA, in acres):	0.5 ac
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	15%
If delineated, DSL file number (WD #) if known:	
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): Systems: Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E Classes: Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PAB
Predominant HGM Class: Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	Depressional
Soil Unit Mapped in Most of the AA:	Waldport-Heceta, fine sands, 0 to 30% slopes
If tidal, the tidal phase during most of visit:	not tidal
What percent (approximate) of the **wetland** were you able to visit?	100
What percent (approximate) of the **AA** were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	yes
How many wetlands have you assessed previously using ORWAP (approximate)?	> 30
.	Ponded wetland dominated by yellow pond lilly. Hydrologic and WQ support function scores rated as "higher" solely due to wetland having no outlet. Otherwise, both would have rated as "lower." Values scores for both of these functions rated as "lower."

Site Name:	**Wetland E**
Investigator Name:	**Ethan Rosenthal**
Date of Field Assessment:	**various during different times of year**

Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.

Normalized Scores & Ratings for this Assessment Area (AA):

Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity
Water Storage & Delay (WS)	10.00	Higher		0.00	Lower	
Sediment Retention & Stabilization (SR)	10.00	Higher		1.95	Lower	
Phosphorus Retention (PR)	10.00	Higher		2.03	Lower	
Nitrate Removal & Retention (NR)	10.00	Higher		1.61	Lower	
Anadromous Fish Habitat (FA)	0.00	Lower		0.00	Lower	
Resident Fish Habitat (FR)	0.00	Lower		0.00	Lower	
Amphibian & Reptile Habitat (AM)	7.08	Higher	MH	3.53	Lower	
Waterbird Nesting Habitat (WBN)	7.30	Higher	MH	10.00	Higher	
Waterbird Feeding Habitat (WBF)	9.50	Higher		10.00	Higher	
Aquatic Invertebrate Habitat (INV)	4.98	Moderate	LM	2.46	Lower	
Songbird, Raptor, Mammal Habitat (SBM)	2.50	Lower		5.00	Moderate	
Water Cooling (WC)	8.43	Higher		0.00	Lower	
Native Plant Diversity (PD)	6.63	Higher	MH	10.00	Higher	
Pollinator Habitat (POL)	0.00	Lower		0.00	Lower	
Organic Nutrient Export (OE)	0.00	Lower				
Carbon Sequestration (CS)	3.50	Lower	LM			
Public Use & Recognition (PU)				3.19	Lower	

Other Attributes:	Score	Rating	Rating Break Proximity
Wetland Sensitivity (SEN)	3.29	Moderate	
Wetland Ecological Condition (EC)	1.67	Lower	
Wetland Stressors (STR)	3.43	Lower	LM

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Higher		Lower	
Water Quality Support (SR, PR, or NR)	Sediment Retention & Stabilization (SR)	Higher		Lower	
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Lower		Lower	
Aquatic Habitat (AM, WBF, or WBN)	Waterbird Nesting Habitat (WBN)	Higher	MH	Higher	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Native Plant Diversity (PD)	Higher	MH	Higher	

ORWAP Version 3.1. Cover Page: Basic Description of Assessment	
Site Name:	Wetland H (East), Wetland I (North and South), Wetland J, and Wetland N
Investigator Name:	Ethan Rosenthal
Date of Field Assessment:	various during different times of year
County:	Coos County
Nearest Town:	North Bend
Latitude (decimal degrees):	43.436061
Longitude (decimal degrees):	-124.2429
TRS, quarter/quarter section and tax lot(s):	
Approximate size of the Assessment Area (AA, in acres):	1.44
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
If delineated, DSL file number (WD #) if known:	
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): Systems: Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E Classes: Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PEM
Predominant HGM Class: Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	Depressional
Soil Unit Mapped in Most of the AA:	Waldport-Heceta, fine sands, 0 to 30% slopes
If tidal, the tidal phase during most of visit:	not tidal
What percent (approximate) of the **wetland** were you able to visit?	100
What percent (approximate) of the **AA** were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	yes
How many wetlands have you assessed previously using ORWAP (approximate)?	> 30
Comments about the site or this ORWAP assessment (attach extra page if desired):	These wetlands are all of similar character and consist of highly disturbed ditch/drainage features and/or maintained areas within industrial grounds associated with the former Weyerhauser Mill site (now referred to as the South Dunes Site). Vegetation is mostly non-native and buffer areas are highly disturbed.

Site Name:	**Wetland H (East), Wetland I (North and South), Wetland J, and Wetland N**
Investigator Name:	**Ethan Rosenthal**
Date of Field Assessment:	**various during different times of year**

Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.

Normalized Scores & Ratings for this Assessment Area (AA):

Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity
Water Storage & Delay (WS)	6.08	Moderate		0.00	Lower	
Sediment Retention & Stabilization (SR)	2.52	Lower		3.35	Moderate	LM
Phosphorus Retention (PR)	0.00	Lower		0.00	Lower	
Nitrate Removal & Retention (NR)	3.70	Lower	LM	3.79	Moderate	LM
Anadromous Fish Habitat (FA)	0.00	Lower		0.00	Lower	
Resident Fish Habitat (FR)	0.00	Lower		0.00	Lower	
Amphibian & Reptile Habitat (AM)	5.54	Moderate		3.07	Lower	
Waterbird Nesting Habitat (WBN)	6.18	Moderate		10.00	Higher	
Waterbird Feeding Habitat (WBF)	6.13	Moderate	MH	10.00	Higher	
Aquatic Invertebrate Habitat (INV)	1.84	Lower		2.24	Lower	
Songbird, Raptor, Mammal Habitat (SBM)	2.75	Lower		5.00	Moderate	
Water Cooling (WC)	1.00	Lower		0.00	Lower	
Native Plant Diversity (PD)	0.00	Lower		0.00	Lower	
Pollinator Habitat (POL)	3.05	Moderate		7.63	Higher	
Organic Nutrient Export (OE)	6.22	Moderate				
Carbon Sequestration (CS)	1.21	Lower				
Public Use & Recognition (PU)				3.31	Lower	

Other Attributes:	Score	Rating	Rating Break Proximity
Wetland Sensitivity (SEN)	2.63	Moderate	LM
Wetland Ecological Condition (EC)	3.35	Moderate	LM
Wetland Stressors (STR)	5.90	Moderate	

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Moderate		Lower	
Water Quality Support (SR, PR, or NR)	Sediment Retention & Stabilization (SR)	Lower		Moderate	LM
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Lower		Lower	
Aquatic Habitat (AM, WBF, or WBN)	Waterbird Nesting Habitat (WBN)	Moderate		Higher	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Pollinator Habitat (POL)	Moderate		Higher	

ORWAP Version 3.1. Cover Page: Basic Description of Assessment	
Site Name:	Wetland 2013-6 and 2012-2
Investigator Name:	Phil Rickus
Date of Field Assessment:	various during different times of year
County:	Coos County
Nearest Town:	North Bend
Latitude (decimal degrees):	
Longitude (decimal degrees):	
TRS, quarter/quarter section and tax lot(s):	
Approximate size of the Assessment Area (AA, in acres):	0.8 ac
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	15%
If delineated, DSL file number (WD #) if known:	
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): Systems: Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E Classes: Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PAB
Predominant HGM Class: Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	Depressional
Soil Unit Mapped in Most of the AA:	Waldport-Heceta, fine sands, 0 to 30% slopes
If tidal, the tidal phase during most of visit:	not tidal
What percent (approximate) of the **wetland** were you able to visit?	100
What percent (approximate) of the **AA** were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	yes
How many wetlands have you assessed previously using ORWAP (approximate)?	> 30
.	Ponded wetland dominated by yellow pond lilly. Hydrologic and WQ support function scores rated as "higher" solely due to wetland having no outlet. Otherwise, both would have rated as "lower." Values scores for both of these functions rated as "lower." Fish Habitat should be rated as zero, since there is no fish access and resident fish are likely not present.

Site Name:	**Wetland 2013-6 and 2012-2**
Investigator Name:	**Phil Rickus**
Date of Field Assessment:	**various during different times of year**

Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.

Normalized Scores & Ratings for this Assessment Area (AA):

Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity
Water Storage & Delay (WS)	10.00	Higher		0.00	Lower	
Sediment Retention & Stabilization (SR)	10.00	Higher		1.95	Lower	
Phosphorus Retention (PR)	10.00	Higher		2.03	Lower	
Nitrate Removal & Retention (NR)	10.00	Higher		1.61	Lower	
Anadromous Fish Habitat (FA)	0.00	Lower		0.00	Lower	
Resident Fish Habitat (FR)	0.00	Lower		0.00	Lower	
Amphibian & Reptile Habitat (AM)	7.08	Higher	MH	3.55	Lower	
Waterbird Nesting Habitat (WBN)	7.45	Higher	MH	10.00	Higher	
Waterbird Feeding Habitat (WBF)	9.60	Higher		10.00	Higher	
Aquatic Invertebrate Habitat (INV)	4.98	Moderate	LM	2.46	Lower	
Songbird, Raptor, Mammal Habitat (SBM)	2.50	Lower		5.00	Moderate	
Water Cooling (WC)	8.43	Higher		0.00	Lower	
Native Plant Diversity (PD)	6.63	Higher	MH	10.00	Higher	
Pollinator Habitat (POL)	0.00	Lower		0.00	Lower	
Organic Nutrient Export (OE)	0.00	Lower				
Carbon Sequestration (CS)	3.63	Lower	LM			
Public Use & Recognition (PU)				3.19	Lower	

Other Attributes:	Score	Rating	Rating Break Proximity
Wetland Sensitivity (SEN)	3.29	Moderate	
Wetland Ecological Condition (EC)	1.67	Lower	
Wetland Stressors (STR)	3.43	Lower	LM

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Higher		Lower	
Water Quality Support (SR, PR, or NR)	Sediment Retention & Stabilization (SR)	Higher		Lower	
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Lower		Lower	
Aquatic Habitat (AM, WBF, or WBN)	Waterbird Nesting Habitat (WBN)	Higher	MH	Higher	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Native Plant Diversity (PD)	Higher	MH	Higher	

ORWAP Version 3.1. Cover Page: Basic Description of Assessment	
Site Name:	Kentuck Site (Pre-Mitigation)
Investigator Name:	Ethan Rosenthal
Date of Field Assessment:	various during different times of year
County:	Coos
Nearest Town:	Coos Bay, North Bend
Latitude (decimal degrees):	43.4266
Longitude (decimal degrees):	-124.1797
TRS, quarter/quarter section and tax lot(s):	
Approximate size of the Assessment Area (AA, in acres):	100 acres
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
If delineated, DSL file number (WD #) if known:	
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): Systems: Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E Classes: Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PEM, PFO, PAB
Predominant HGM Class: Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	Slope/Flats
Soil Unit Mapped in Most of the AA:	Coquille silt loam
If tidal, the tidal phase during most of visit:	not tidal
What percent (approximate) of the **wetland** were you able to visit?	100
What percent (approximate) of the **AA** were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	yes
How many wetlands have you assessed previously using ORWAP (approximate)?	>30
Comments about the site or this ORWAP assessment (attach extra page if desired):	Fish function score manually adjusted to low, since site is diked off from Coosy Bay and Kentuck Slough. Tidegated culvert prevents fish access. ORWAP currently does not account for blockage by tide gates.

Site Name:	**Kentuck Site (Pre-Mitigation)**
Investigator Name:	**Ethan Rosenthal**
Date of Field Assessment:	**various during different times of year**

Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.

Normalized Scores & Ratings for this Assessment Area (AA):

Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity
Water Storage & Delay (WS)	2.85	Lower		0.00	Lower	
Sediment Retention & Stabilization (SR)	5.02	Moderate		7.05	Higher	
Phosphorus Retention (PR)	2.71	Lower	LM	5.20	Moderate	
Nitrate Removal & Retention (NR)	4.48	Moderate	LM	10.00	Higher	
Anadromous Fish Habitat (FA)	7.36	Moderate	MH	10.00	Higher	
Resident Fish Habitat (FR)	0.00	Lower		0.00	Lower	
Amphibian & Reptile Habitat (AM)	6.95	Higher	MH	2.34	Lower	
Waterbird Nesting Habitat (WBN)	6.93	Moderate	MH	10.00	Higher	
Waterbird Feeding Habitat (WBF)	8.90	Higher		10.00	Higher	
Aquatic Invertebrate Habitat (INV)	3.26	Lower		1.04	Lower	
Songbird, Raptor, Mammal Habitat (SBM)	3.47	Lower	LM	10.00	Higher	
Water Cooling (WC)	4.84	Moderate	MH	4.09	Moderate	
Native Plant Diversity (PD)	0.00	Lower		0.00	Lower	
Pollinator Habitat (POL)	5.20	Moderate		4.43	Moderate	
Organic Nutrient Export (OE)	7.30	Higher	MH			
Carbon Sequestration (CS)	5.16	Moderate				
Public Use & Recognition (PU)				2.06	Lower	

Other Attributes:	Score	Rating	Rating Break Proximity
Wetland Sensitivity (SEN)	2.75	Moderate	LM
Wetland Ecological Condition (EC)	2.75	Lower	LM
Wetland Stressors (STR)	5.83	Moderate	

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Lower		Lower	
Water Quality Support (SR, PR, or NR)	Sediment Retention & Stabilization (SR)	Moderate		Higher	
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Moderate	MH	Higher	
Aquatic Habitat (AM, WBF, or WBN)	Waterbird Feeding Habitat (WBF)	Higher		Higher	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Organic Nutrient Export (OE)	Higher	MH	0.00	0.00

ORWAP Version 3.1. Cover Page: Basic Description of Assessment	
Site Name:	Kentuck Site-Tidal (Post-Mitigation)
Investigator Name:	Ethan Rosenthal
Date of Field Assessment:	various during different times of year
County:	Coos
Nearest Town:	Coos Bay, North Bend
Latitude (decimal degrees):	43.4197
Longitude (decimal degrees):	-124.1923
TRS, quarter/quarter section and tax lot(s):	
Approximate size of the Assessment Area (AA, in acres):	90 acres
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
If delineated, DSL file number (WD #) if known:	
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): Systems: Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E Classes: Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	EEM, ESS, EFO, EUS
Predominant HGM Class: Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	E
Soil Unit Mapped in Most of the AA:	N/A
If tidal, the tidal phase during most of visit:	N/A
What percent (approximate) of the **wetland** were you able to visit?	100
What percent (approximate) of the **AA** were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	yes
How many wetlands have you assessed previously using ORWAP (approximate)?	>30
Comments about the site or this ORWAP assessment (attach extra page if desired):	Assessment is based on the mitigation site design. 100 percent of the site has been visited; however, this site is currently diked of from tidal influence. Post-mitigation, the site will have tidal influence. Some freshwater wetlands have been included in the design, but will likely still have a degree of tidal influence via a fluctuating ground water surface.

Site Name:	**Kentuck Site-Tidal (Post-Mitigation)**
Investigator Name:	**Ethan Rosenthal**
Date of Field Assessment:	**various during different times of year**

Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.

Normalized Scores & Ratings for this Assessment Area (AA):

Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity
Water Storage & Delay (WS)	0.00	Lower		0.00	Lower	
Sediment Retention & Stabilization (SR)	7.39	Higher		8.75	Higher	
Phosphorus Retention (PR)	5.02	Moderate		3.18	Lower	LM
Nitrate Removal & Retention (NR)	5.87	Moderate		10.00	Higher	
Anadromous Fish Habitat (FA)	9.23	Higher		10.00	Higher	
Resident Fish Habitat (FR)	9.43	Higher		10.00	Higher	
Amphibian & Reptile Habitat (AM)	0.00	Lower		0.00	Lower	
Waterbird Nesting Habitat (WBN)	0.00	Lower		0.00	Lower	
Waterbird Feeding Habitat (WBF)	9.67	Higher		10.00	Higher	
Aquatic Invertebrate Habitat (INV)	8.86	Higher		8.61	Higher	
Songbird, Raptor, Mammal Habitat (SBM)	10.00	Higher		10.00	Higher	
Water Cooling (WC)	0.00	Lower		0.00	Lower	
Native Plant Diversity (PD)	9.96	Higher		10.00	Higher	
Pollinator Habitat (POL)	7.57	Higher		2.58	Moderate	LM
Organic Nutrient Export (OE)	8.53	Higher				
Carbon Sequestration (CS)	8.90	Higher				
Public Use & Recognition (PU)				6.36	Moderate	MH

Other Attributes:	Score	Rating	Rating Break Proximity
Wetland Sensitivity (SEN)	4.61	Higher	MH
Wetland Ecological Condition (EC)	10.00	Higher	
Wetland Stressors (STR)	5.00	Moderate	

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Lower		Lower	
Water Quality Support (SR, PR, or NR)	Sediment Retention & Stabilization (SR)	Higher		Higher	
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Higher		Higher	
Aquatic Habitat (AM, WBF, or WBN)	Waterbird Feeding Habitat (WBF)	Higher		Higher	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Aquatic Invertebrate Habitat (INV)	Higher		Higher	

ORWAP Version 3.1. Cover Page: Basic Description of Assessment	
Site Name:	Kentuck--Fresh (Post-Mitigation)
Investigator Name:	Ethan Rosenthal
Date of Field Assessment:	various during different times of year
County:	Coos
Nearest Town:	Coos Bay, North Bend
Latitude (decimal degrees):	43.4266
Longitude (decimal degrees):	-124.1797
TRS, quarter/quarter section and tax lot(s):	
Approximate size of the Assessment Area (AA, in acres):	9 acres
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
If delineated, DSL file number (WD #) if known:	
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): Systems: Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E Classes: Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PFO, PSS, PEM
Predominant HGM Class: Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	Riverine
Soil Unit Mapped in Most of the AA:	Coquille silt loam
If tidal, the tidal phase during most of visit:	not tidal
What percent (approximate) of the **wetland** were you able to visit?	100
What percent (approximate) of the **AA** were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	yes
How many wetlands have you assessed previously using ORWAP (approximate)?	>30
Comments about the site or this ORWAP assessment (attach extra page if desired):	Assessment is based on the mitigation site design. 100 percent of the site has been visited; however, this site is currently diked of from Kentuck Creek. Post-mitigation, the site will be open to overbank flows during high water.

Site Name:	**Kentuck--Fresh (Post-Mitigation)**
Investigator Name:	**Ethan Rosenthal**
Date of Field Assessment:	**various during different times of year**

Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.

Normalized Scores & Ratings for this Assessment Area (AA):

Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity
Water Storage & Delay (WS)	5.92	Moderate		0.00	Lower	
Sediment Retention & Stabilization (SR)	5.00	Moderate		6.89	Higher	
Phosphorus Retention (PR)	2.99	Lower	LM	4.32	Moderate	
Nitrate Removal & Retention (NR)	5.29	Moderate		10.00	Higher	
Anadromous Fish Habitat (FA)	8.82	Higher		10.00	Higher	
Resident Fish Habitat (FR)	6.45	Higher	MH	10.00	Higher	
Amphibian & Reptile Habitat (AM)	6.98	Higher	MH	1.70	Lower	
Waterbird Nesting Habitat (WBN)	5.73	Moderate		10.00	Higher	
Waterbird Feeding Habitat (WBF)	4.26	Moderate		10.00	Higher	
Aquatic Invertebrate Habitat (INV)	7.82	Higher		1.14	Lower	
Songbird, Raptor, Mammal Habitat (SBM)	3.78	Moderate	LM	10.00	Higher	
Water Cooling (WC)	7.50	Higher		3.64	Moderate	
Native Plant Diversity (PD)	7.56	Higher		6.67	Moderate	MH
Pollinator Habitat (POL)	7.54	Higher		4.43	Moderate	
Organic Nutrient Export (OE)	7.68	Higher				
Carbon Sequestration (CS)	1.65	Lower				
Public Use & Recognition (PU)				3.92	Lower	LM

Other Attributes:	Score	Rating	Rating Break Proximity
Wetland Sensitivity (SEN)	2.08	Lower	LM
Wetland Ecological Condition (EC)	5.90	Higher	
Wetland Stressors (STR)	3.13	Lower	LM

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Moderate		Lower	
Water Quality Support (SR, PR, or NR)	Sediment Retention & Stabilization (SR)	Moderate		Higher	
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Higher		Higher	
Aquatic Habitat (AM, WBF, or WBN)	Amphibian & Reptile Habitat (AM)	Higher	MH	Lower	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Water Cooling (WC)	Higher		Moderate	

APPENDIX D: PIPELINE WETLAND FUNCTIONAL ASSESSMENT

ecology and environment, inc.

Jordan Cove LNG

Memorandum
High Value Wetlands

September 1, 2017

Wetland Functions and Values

Wetlands contribute to the ecological framework of Oregon's aquatic resources, which provide different environmental services. The U.S. Army Corps of Engineers and the Oregon Department of State Lands have outlined these environmental services in terms of functions and values. Wetland functions are their physical, chemical, and biological processes. Wetland values express the significance of functions to the needs of society (Adamus and Verble 2016).

Functional assessments of wetlands are often needed to broadly determine habitat losses and/or gains. Functional losses could arise when one wetland type is changed to another (i.e., wetland conversion), while gains could occur during wetland mitigation activities. Since some permanent wetland conversion will occur as a result of the project, the functions of wetlands that are directly impacted by project-related activities (e.g., clearing, grading, etc.) will be assessed using the Oregon Rapid Wetland Assessment Protocol (ORWAP). ORWAP is a system that rates wetland functions and values using a 0–10 scoring range. It rates wetlands according to 16 different functions (e.g. water storage, sediment retention, thermoregulation, habitat for different species, etc.) (Adamus and Verble 2016). These functions and values can be aggregated into Group Levels to serve as a helpful summary for the purposes of reporting ORWAP scores for regulatory programs. Primary groups include hydrologic function, water quality support, fish habitat, aquatic habitat, and ecosystem support (DSL 2016). When an ORWAP analysis is conducted, a wetland receives a rating for each group and function identified in Table 1.

Table 1 Oregon Rapid Wetland Assessment Protocol Wetland Groups and Functions

Primary Groups	Functions within Each Group
Hydrologic Function	• Water storage and delay
Water Quality Support	• Sediment retention and stabilization • Phosphorus retention • Nitrate removal and retention
Fish Habitat	• Anadromous fish habitat • Resident fish habitat
Aquatic Habitat	• Amphibian and reptile habitat • Water bird nesting habitat • Water bird feeding habitat
Ecosystem Support	• Water cooling • Aquatic invertebrate habitat • Native plant diversity • Pollinator habitat • Songbird, raptor and mammal habitat • Organic nutrient export

In 2009, a function assessment was completed by ICF Jones & Stokes using best professional judgment (BPJ) and the Judgmental Method. BPJ was used due to the large spatial scale of the project area and the overall similarity of most of the features encountered. The wetland acreage within the project area was totaled at the fifth-field HUC level, and the wetland functions and values were then cumulatively assessed for:

- Water quality and quantity functions;
- Fish and wildlife habitat functions;
- Native plant communities and species diversity functions; and
- Recreational and educational values.

Wetlands were classified using hydrogeomorphic (HGM) classes and/or subclasses according to their hydrologic source and landscape position. Each wetland was also classified according to the Cowardin (1979) system. Based on observable field indicators of the conditions and process, location of the wetlands within the watershed and proximity to other wetlands, and HGM and Cowardin classifications, the project delineated wetlands aggregated at the fifth-field HUC level were scored high, moderate, or low. Since access has not been granted to all parcels to prepare an updated HGM Report, the 2009 report was updated with current wetland data and acreages to reflect the pipeline corridor as of July 2017.

Aside from specific functions and values, three other, broader attributes to wetland health are determined when using ORWAP: ecological condition, stressors, and sensitivity. Ecological condition can be measured in general terms by vegetation composition and its comparable characteristics to reference wetland data. Stressors can be described by observing the degree to which the wetland has been subjected to negative human-influenced factors. Sensitivity of a wetland can be viewed as the wetland's "intrinsic resistance and resilience" to stressors, with a higher score denoting a more sensitive ecosystem.

Project Converted Wetlands

Removal of trees and other woody vegetation for the project would result in altering existing wetland community types. This would primarily entail conversion of scrub-shrub wetlands and forested wetlands to emergent wetlands. The project would permanently impact 0.83 acres of wetlands due to conversion. While current ORWAP field work has yet to be conducted, desktop analysis using wetland datasheets and previous ORWAP scores can give a generalized summary of the functions and values of permanently impacted wetlands along the project corridor.

Scrub-shrub wetlands, classified as PSS (palustrine scrub-shrub) by the National Wetland Inventory (NWI), are wetlands that are dominated by saplings and shrubs that are less than 20 feet tall (Cowardin et. al. 1979). Tree sapling and shrub species typical of the PSS wetlands subject to conversion along the project route include willows species (*Salix spp.*), Oregon ash (*Fraxinus latifolia*), Douglas spirea (*Spiraea douglasii*), and sweet briar (*Rosa eglanteria*). In some areas, PSS wetlands are co-dominant with emergent wetlands (palustrine emergent or PEM). While not applicable to every PSS wetland undergoing conversion, previous ORWAP data shows PSS wetlands exhibiting high function and value scores in the following aggregated groups: water quality, aquatic support, and terrestrial support (DEA 2013).

Forested wetlands, classified as PFO (palustrine forested) by the NWI, are dominated by trees and shrubs that are 20 feet or taller. Forested wetlands contain mature tree canopies and, depending on species, can have substantial shrub and ground cover layers. Tree species typical of the PFO wetlands subject to conversion along the project right-of-way include red alder (*Alnus rubra*), Oregon ash (*Fraxinus latifolia*), and various willow species (*Salix spp.*). While not applicable to every PFO wetland undergoing conversion, previous ORWAP data shows PFO wetlands exhibiting high function and value scores in water quality,

aquatic support, and terrestrial support groups (DEA 2013). In instances where streams or other waterbodies are adjacent to a PFO, high function and value scores are expected within the fish support group, as trees and shrubs can shade waterbodies and provide temperature regulation among other services (ODFW 2017). Conversion of PSS and PFO wetland types to PEM types will result in changes to current wetland function and values. Since trees and shrubs typically provide more cover and habitat opportunities, it can be assumed that terrestrial support functions and values will be lower. If shade trees and shrubs are removed adjacent to fish-bearing waterbodies, it can be assumed that functions and values associated with the fish support group will be lower. However, exact changes in function and value scores are not known at this time. Field assessments will be carried out to apply the ORWAP to wetlands subject to conversion along the project corridor.

References

Adamus, P. and K. Verble. 2016. Manual for the Oregon Rapid Assessment Protocol (ORWAP), Version 3.1. Oregon Department of State Lands, Aquatic Resource Management Program. http://www.oregon.gov/dsl/WW/Documents/ORWAP_3_1_Manual_Nov_2016.pdf

David Evans and Associates (DEA). 2013. Pacific Connector Gas Pipeline Compensatory Wetland Mitigation Plan.

Department of State Lands (DSL). 2016. Guidance for Using the Oregon Rapid Wetland Assessment Protocol (ORWAP) in the State and Federal Permit Programs. http://www.oregon.gov/dsl/WW/Documents/Guidance_for_Regulatory_Use_of_ORWAP_v3_1.pdf

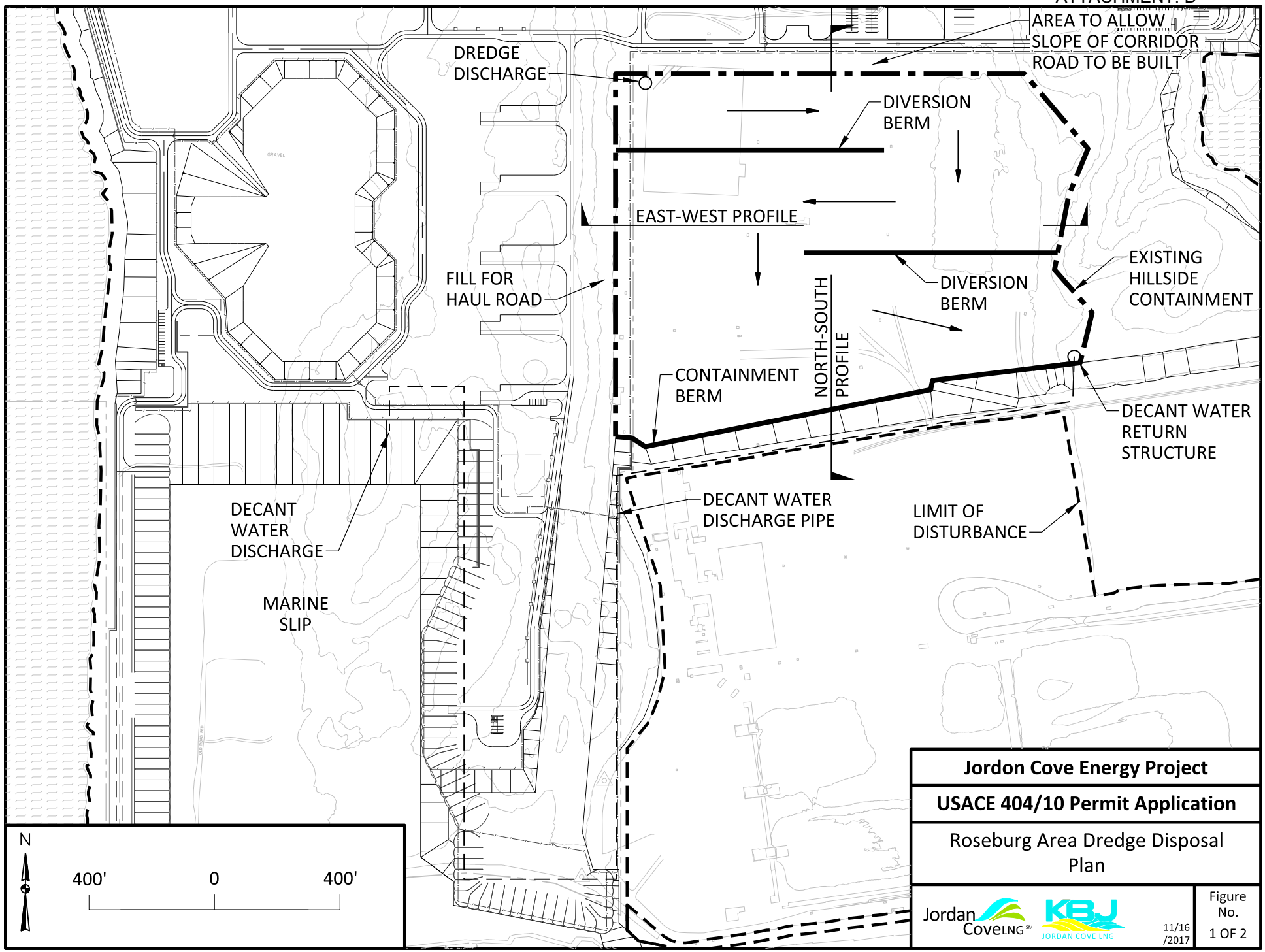
Oregon Department of Fish and Wildlife (ODFW). 2017. The Oregon Conservation Strategy, Conserve Wetlands. http://oregonconservationstrategy.org/strategy-habitat/wetlands/

Attachment C: Bulk Upload Templates

Furnished to USACE as Excel Spreadsheets

Pacific Connector GAS PIPELINE Jordan Cove LNG™	**Corps No: NWP-2017-41**	DAVID EVANS AND ASSOCIATES INC.
	Document Number: J1-000-RGL-PMT-DEA-00005-00	
	Rev.: A	**Rev. Date: December 1, 2017**

Attachment D: Roseburg Site Dredge Disposal Plan View and Cross Sections



Jordon Cove Energy Project

USACE 404/10 Permit Application

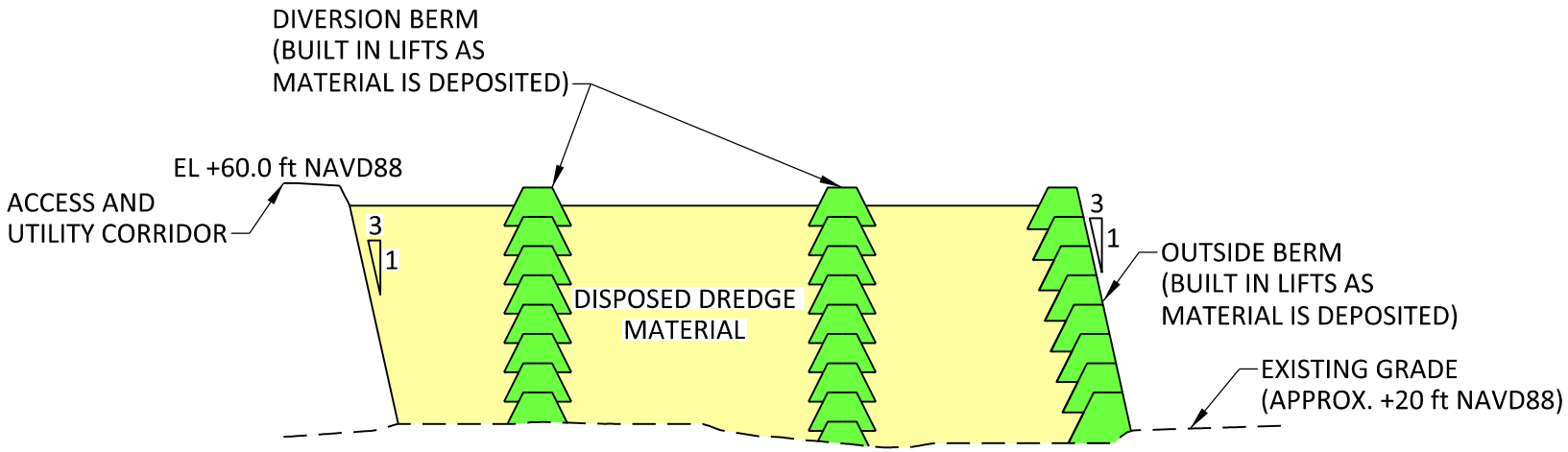
Roseburg Area Dredge Disposal Plan

Jordan Cove LNG SM

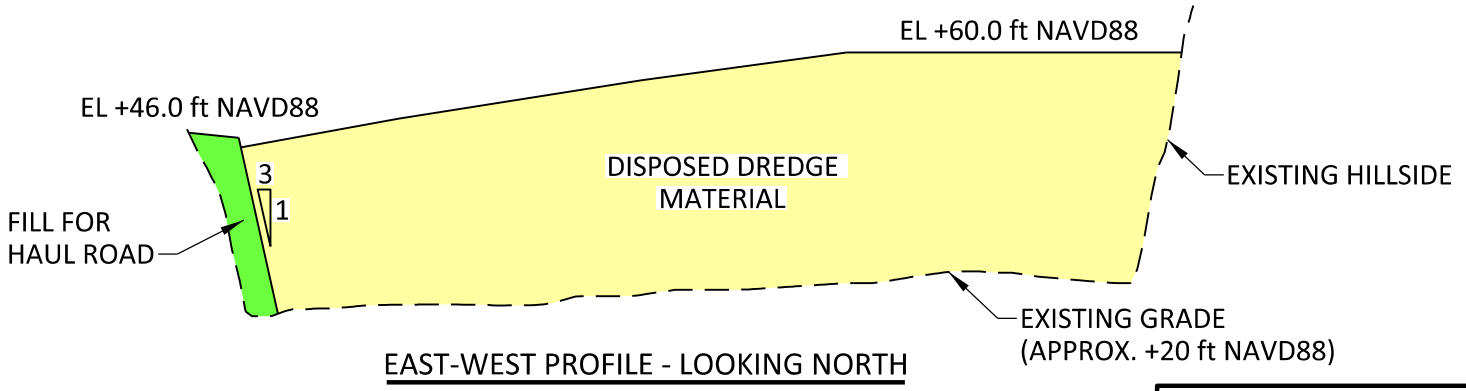
KBJ JORDAN COVE LNG

11/16/2017

Figure No. 1 OF 2



NORTH-SOUTH PROFILE - LOOKING EAST



EAST-WEST PROFILE - LOOKING NORTH

N

Not To Scale

Jordon Cove Energy Project

USACE 404/10 Permit Application

Roseburg Area Dredge Disposal Profiles

Jordan Cove LNG SM

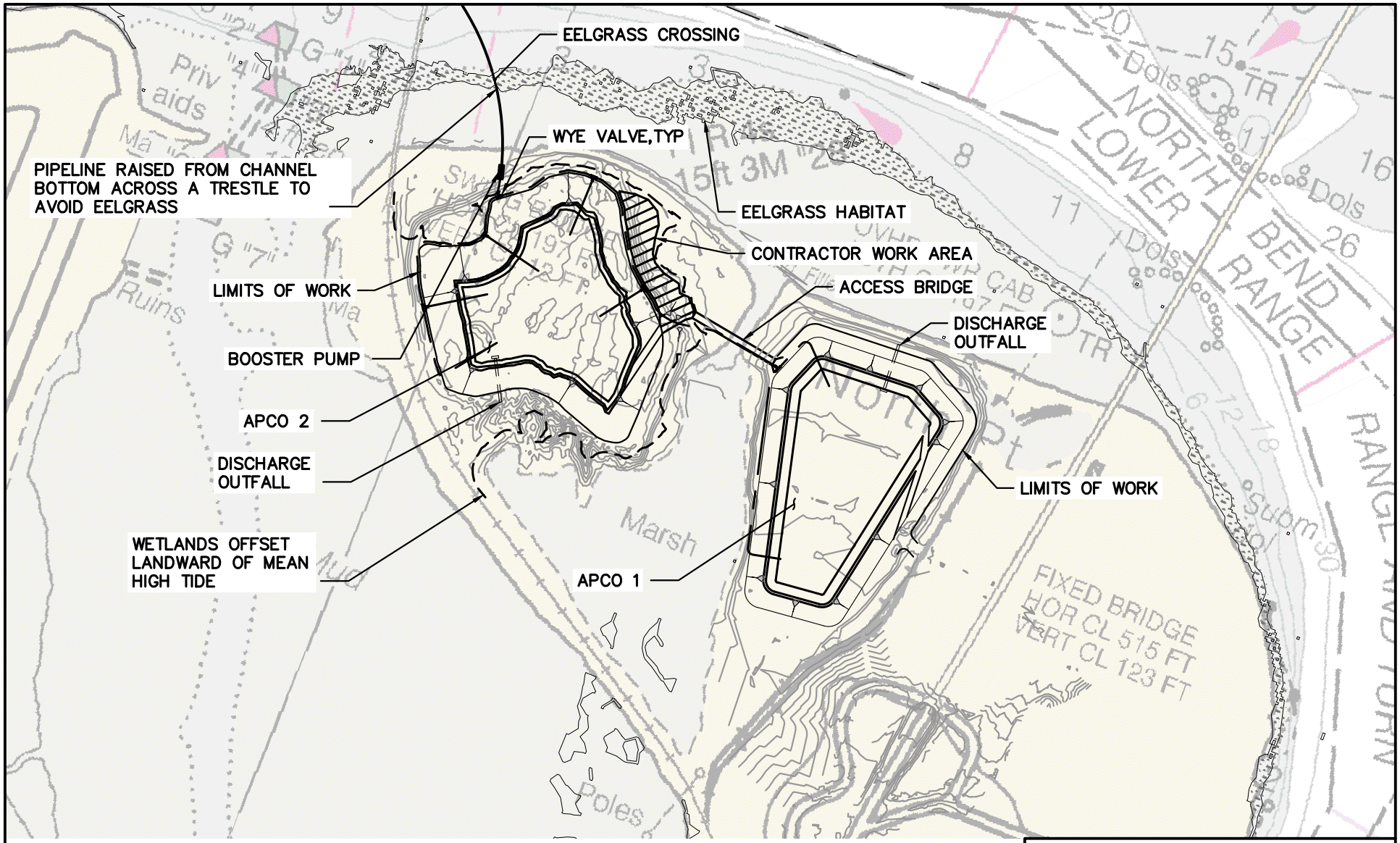
KBJ JORDAN COVE LNG

11/16/2017

Figure No. 2 OF 2

Pacific Connector GAS PIPELINE Jordan Cove LNG™	**Corps No: NWP-2017-41**	DAVID EVANS AND ASSOCIATES INC.
	Document Number: J1-000-RGL-PMT-DEA-00005-00	
	Rev.: A / **Rev. Date: December 1, 2017**	

Attachment E: APCO Dredge Disposal Site Cross Plan View and Cross Sections



Jordan Cove Energy Project

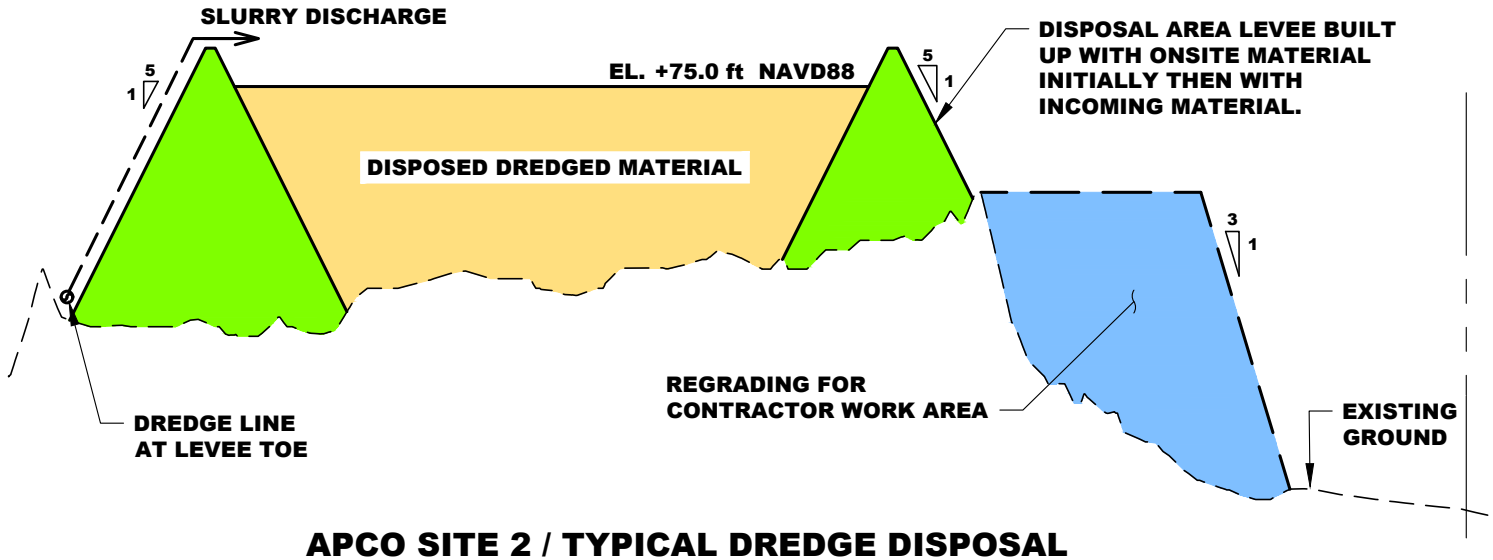
USACE 404/10 Permit Application

APCO SITES 1 AND 2 DISPOSAL PLAN

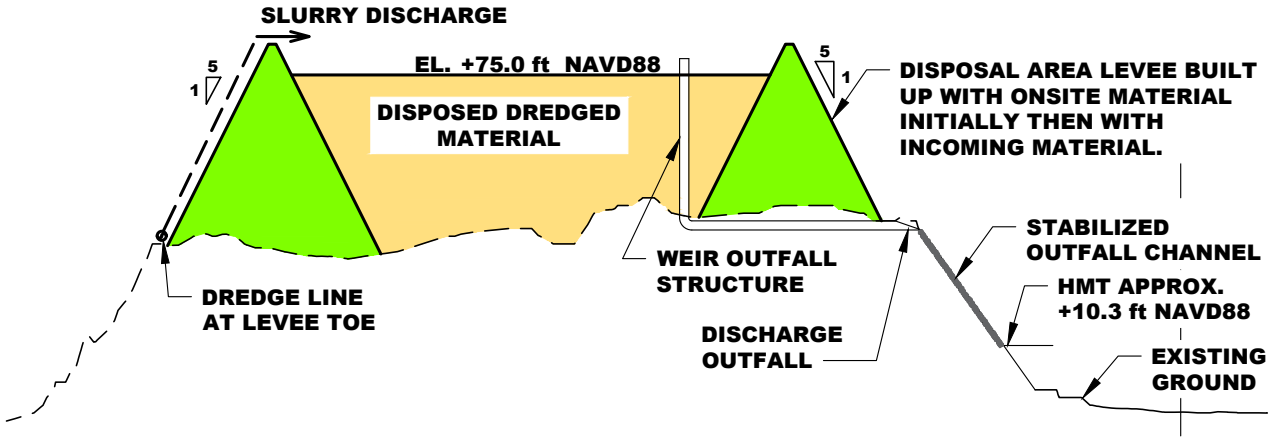
Jordan Cove LNG

12/1/2017

FIGURE NO. D.6.A-1



APCO SITE 2 / TYPICAL DREDGE DISPOSAL



APCO SITE 2 / TYPICAL DREDGE DISPOSAL

200' 0 200'

SCALE: 1"=200'

Jordan Cove Energy Project	
USACE 404/10 Permit Application	
APCO SITE 2 SITE LEVEE SECTION	
Jordan Cove LNG 11/17/2017	FIGURE NO. D.6.A-2

US Army Corps
of Engineers
Portland District

SPECIAL PUBLIC NOTICE

Jordan Cove LNG Project

Issue Date: July 17, 2018
US Army Corps of Engineers No: NWP-2017-41

On May 22, 2018, the U.S. Army Corps of Engineers, Portland District (Corps) issued a 60-day public notice regarding the Corps' receipt of an application for a Department of the Army permit and permission for certain work in waters of the United States associated with the Jordan Cove Liquefied Natural Gas and Pacific Connector Gas Pipeline Projects (Project). We have received multiple requests to hold public meetings, public hearings, and/or extend the public notice comment period.

The Corps public comment period for the Project was originally set to close on July 21, 2018. We have determined extending the public comment period with a new comment close date of August 20, 2018 is in the public interest and is hereby granted.

Per Corps' regulations, the Corps holds a public hearing when there is a valid public interest to be served by a hearing, such as when substantive project issues cannot be addressed by any other means and a hearing would provide additional information that is necessary for a thorough evaluation of the issues. We will work with the applicant directly to address issues raised through public comment to determine if a public hearing is necessary.

The Corps is a cooperating agency on the Federal Energy Regulatory Commission's (FERC) preparation of an Environmental Impact Statement for the project. Per Corps' regulations, if the Corps believes a public hearing should be held and another agency is lead agency (i.e., FERC), the Corps will make that request to the lead agency. The Corps will notify the public of our position regarding project-specific public hearing(s) in the future. In addition, the Corps will not be holding public meetings at this time, but will work with FERC regarding if and when such meetings would be held.

All comments, whether by conventional mail or email, must be received no later than August 20, 2018 to ensure consideration. Comments should be submitted to the following mailing address or email address below.

Email: NWP-2017-41@usace.army.mil

Hard copy: U.S. Army Corps of Engineers
North Bend Field Office
2201 North Broadway, Suite C
North Bend, Oregon 97459-2372

AGENDA ITEM SUMMARY

Date: August 13, 2019

To: City of Coos Bay City Council

From: Lane Council Governments (LCOG) Contact:
Henry Hearley, Assistant Planner, 541-682-3089, hhearley@lcog.org
Jacob Callister, Principal Planner, 541-682-4114, jcallister@lcog.org

RE: **Land Use Application #187-18-000153 – Jordan Cove Energy Project Navigation and Efficiency and Reliability of the Coos Bay Deep Draft Navigation Channel.**

The City Council is scheduled to hold a public hearing on August 27 at which time they will receive and consider staff's report on the Jordan Cove application, the Planning Commission's recommendation and will accept public testimony. Appropriate notice for this meeting has been provided.

Following this Agenda Summary is an expanded report that remains largely unchanged from what the Planning Commission reviewed at their July 23, 2019 meeting.

PROCESS TIMELINE

See the information noted below at www.coosbay.org/departments/community-development.

- November 21, 2018 - City receives Land Use Application from Perkins Coie, the applicant's representative. Following submittal, City of Coos Bay staff contract with LCOG to help process the application. A 30-day completeness review of the application ensues.
- December 20, 2018 – LCOG issues a "letter of incompleteness" requesting clarification and additional information with respect to their submittal.
- February 4, 2019 – Applicant's representative submits the additional information and clarification on items requested. Staff reviewed the information.
- February 12, 2019 – LCOG issues a "letter of completeness" for Land Use Application #187-18-000153.
- March 21, 2019 – First evidentiary public hearing held in front of City of Coos Bay Planning Commission. The public hearing was closed. A request for the record to be left open was requested and granted.
- March 22 – April 25, 2019 - First open record period.
- April 26 – May 16, 2019 – Second record period limited to issues raised during the first open record period.
- May 23, 2019 – Applicant issues their final written arguments in support of the application.
- July 23, 2019 – City of Coos Bay Planning Commission meeting to hear testimony received and deliberate on the matter. Staff presented a revised staff report and the Planning Commission provided a recommendation on key decision criteria.
- August 27, 2019 – Council will receive and consider staff's report on the Jordan Cove application, the Planning Commission's recommendation and will accept public testimony.

BACKGROUND/CONTEXT
The applicant, Jordan Cove Energy Project (JCEP), proposes amendments to the City's comprehensive plan and zoning map to create an area for dredging and 2) dredging, or "Navigational Reliability Improvements" (NRIs) within the Coos Bay Deep Draft Navigational Channel in a specified area. The applicant's intent is to increase the operational window to safely transit any vessel through the Channel. The NRIs, which are described in more detail in the staff report (Page 2), are designed to increase the environmental operating windows for all ships entering Coos Bay by softening critical turns, relocating aids to navigation and reducing the required Channel directional changes. Minimizing delay is a need identified by the applicant.

The Coos Bay Estuary Management Plan (CBEMP) addresses compliance with Statewide Planning Goal 16 - Estuarine Resources. Goal 16 requires that all areas within an estuary be classified into management units in the estuary management plan. There are three "aquatic" management units in the CBEMP: Natural Aquatic (NA), Conservation Aquatic (CA) and Development Aquatic (DA). This application proposes an amendment to change an area of the Coos Bay Estuary from Natural Aquatic (NA), which is more restrictive, to Development Aquatic (DA), which is less restrictive.

APPLICANT'S REQUEST
JCEP proposes dredging at four locations in the Channel. Three of the proposed NRIs are within Coos County and one (NRI - Dredge Area #4) is within the City of Coos Bay. The applicant is proposing the following applications to address NRI#4:

(1) A map amendment to the Coos Bay Estuary Management Plan and zoning map to change the designation of approximately 3.3 acres from 52-NA to DDNC-DA;

(2) A text amendment to the City of Coos Bay Comprehensive Plan to take a reasons exception to Statewide Planning Goal 16 Estuarine Resources to authorize the map amendment;

(3) An estuarine and coastal shoreline uses and activities permit for "New and Maintenance Dredging" in the DDNC-DA Estuarine Zone; and

(4) An estuarine and coastal shoreline uses and activities permit to allow an accessory temporary dredge transport pipeline in the 52-NA, 53-CA, 54-DA, and 55-CA Estuarine Zones.

ANALYSIS & STAFF REPORT
The City of Coos Bay contracted with the Lane Council of Governments (LCOG) to conduct a neutral analysis and prepare an accompanying staff report for the Estuary Management Plan and comprehensive plan text amendments and the Jordan Cove NRI permit applications. Decisions and conclusions on the application ultimately lie with the City Council. LCOG's analysis is intended to provide guidance in making findings and conclusions for the applications.

This memo points out several key criteria or "pivot points" that staff feel are of particular significance for the Council to consider in rendering decisions on this land use application. Pivot points are criteria that staff have less objective confidence in drawing definitive conclusions on. Some of these criteria are highly subjective. Staff's analysis of these criteria may pivot one way or another, but staff look to the Council to draw actionable conclusions on these particular criteria.

On July 23rd, 2019, the Planning Commission reviewed these pivot points and passed a motion to recommend an approval finding for each of these specific criteria (outlined in the following section "Key Criteria"). The Commission also recommended all of the proposed conditions of approval. The attached Notice of Planning Commission Recommendation which contains the motions and findings of Planning Commission, and minutes from the Planning Commission meeting are attached.

KEY PARAMETERS

Analysis of the application is constrained by the following key parameters:

- The applications are entirely dependent on the applicant receiving approval of a Goal 16 exception. Without an exception to Estuarine Resources, the 3.3-acre dredge site cannot be changed in the comprehensive plan from a Natural Aquatic to a Development Aquatic unit. It is also noted that permits cannot be issued for dredge and temporary pipeline work if text changes to the comprehensive plan are not approved. In sum, without the approval of all four requests by the applicant, the applicant's proposed dredging at NRI #4 would be highly unlikely to be able to proceed.
- An "exception" to a Statewide Planning Goal ("exception") is an allowance of a use otherwise prohibited by a goal. By their very nature, an exception contradicts state land use policy and are (and should be) difficult to secure. Criteria addressing exceptions "reasons" are very carefully considered.
- The subject area of this application is the 3.3-acres of area currently designated NA-52 by the CBEMP. State law and local code confines the Planning Commission's consideration to the impacts from the use(s) proposed in this application, accordingly, most, if not all, evidence addressing full LNG elements are irrelevant to the applicable evaluation criteria. A key example is the Coos Bay Municipal Code Section 17.360.010 (B) which outlines criteria for comprehensive plan amendments related to cumulative effects. Staff have found that in rendering a decision on this application, the local decision maker may only address impacts resulting from the activities proposed by this City application alone. The decision maker is not allowed to consider impacts based on other applications for other activities that are not presented as part of this application. The decision maker is also required to make the decision based solely on the applicable criteria that are found in the local code and comprehensive plan. A further discussion of this can be found on page 10 of the staff report.
- Coos Bay Municipal Code Section 17.360.010 (B) also only require that the approval body "consider" the cumulative effects of this proposal for a comprehensive plan amendment that would facilitate the permits under review; i.e., the proposed dredging at NRI site #4. By conducting the hearing and issuing a recommendation, Coos Bay's decision-making bodies have necessarily considered the cumulative effects.

KEY CRITERIA

Following is a summary of the criteria LCOG identified as "Pivot Points" (described above). The attached report addresses all approval criteria (criteria outlined on Page 8). The City Council will benefit from focused characterization of key criteria to facilitate interpretation and conclusions.

Criteria	Report Page	Approval	Denial	Interpretation / Analysis
CBMC 17.360.060 (A)(2), THE PROPOSED AMENDMENT IS IN THE PUBLIC INTEREST	Page 15	Relies on a finding that: The proposal results in safer and more efficient navigation in the Bay and this affects the public interest in a net positive way. (may cite additional reasons)	Relies on a finding that: The proposal does not result in compellingly safer and more efficient navigation in the Bay and/or such improvements, on balance, do not affect the public interest in a net positive way. The proposal is not in the public's interest.	Subjective. Decision makers will have to interpret what is meant by the "public interest" and make findings in support of their decision.
Goal 2 – Land Use Planning - Which requires assurance of a factual basis for land use decisions. (relative to ODEQ's Water Quality Certification Permit denial)	Page 17	Relies on a finding that: The proposal is consistent with Goal 2 subject to a condition that the applicant will meet all state and federal requirements	Relies on a finding that: The ODEQ decision could not find the proposal consistent with turbidity standards. CBEMP Policy 5(E) enables the City to leverage state and federal requirements (including ODEQs denial of JCEP's Water Quality Certification Permit.)	Have to be able to connect the ODEQ denial decision to applicable criteria and/or conditions. There could be an argument for denial based on the ODEQ decision; however the Planning Commission could recommend approval subject to the following Condition of approval #1: ***Prior to the commencement of any dredging activities, JCEP shall provide the City of Coos Bay Community Development Administrator evidence of an approved Section 401 Water Quality Certification permit and evidence that the dredging complies with FEIS requirements.***

Criteria	Report Page	Approval	Denial	Interpretation / Analysis
Goal 6 – Air, Water and Land Resources Quality.	Page 19	Relies on a finding that: It is reasonable to anticipate that the applicant can meet environmental quality standards, subject to the applicant's securing an ODEQ Water Quality Certification Permit and a finding of no impact or mitigatable impact(s) in the Final Environmental Impact Statement.	Relies on a finding that environmental quality standards cannot be met as proposed, based on the failings of the Draft EIS and ODEQ denial of a Water Quality Certification Permit which identifies turbidity from dredging as a cause for denial.	Relies on state and federal regulations. Findings have to explain why "it is reasonable to expect that applicable state and federal environmental quality standards can be met as proposed." Any recommendation for approval should be subject to a condition to assure the approved project meet state and federal requirements as described in Condition #1.
OAR 660-004-0020 (d) The proposed uses are compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts.	Page 29	Relies on a finding that: The proposal would occur adjacent to the existing 52-NA designation area; however, the CBEMP does not identify the marine organisms in area 52-NA as "uses."	Relies on a finding that: The sensitive NA-52 zone with shellfish beds and crabbing areas are adjacent uses and measures designed to reduce adverse impacts to these adjacent uses are insufficient given ODEQ's denial based on turbidity levels from dredging.	Decision makers should consider the definition of an adjacent use. If authorized, the proposal would be occurring adjacent to the existing 52-NA designation. If the term is "uses" is strictly applied as listed in the CBEMP under 52-NA no marine organisms are listed as "uses". Opponent comments note that adjacent to NRI #4 are shellfish beds and crabbing areas. The applicant, in their evidence, characterized only the Channel in-general as an adjacent use. Opposition notes that the sensitive NA-52 zone is an adjacent use.

Criteria	Report Page	Approval	Denial	Interpretation / Analysis
OAR 660-004-0022 (1) (a) There is a demonstrated need for the proposed use or activity based on one or more of the requirements of Goals 3 to 19.	Page 32	Relies on a finding that: The exception is necessary based on Goal 9 (Economic Development) and Goal 12 (Transportation) in that the proposal will bring about economic benefits and development and the NRIs will decrease transit delays and increase navigational safety for all transiting vessels in the Bay.	Relies on a finding that: The applicant has not provided evidence sufficient to indicate that an exception is required in order to meet the City's Goal 9 and Goal 12 obligations. Market demand or findings that the use would contribute to the local economy are not sufficient. Demonstrated need for an exception must show that the City will fail or is at risk to provide adequate opportunities for a variety of economic activities, for example, without the exception.	The demonstrated need for an exception must be based on requirements of one or more of the statewide planning goals; i.e., the exception is required in order to meet the City's obligation under one or more of the goals. The Planning Commission should determine, for the purposes of any recommendation, whether an exception is *required* in order to meet the City's Goal 9 and Goal 12 obligations. Pages 34 and 35 of the staff reports provides further discussion.
OAR 660-004-002(8)(b) Dredging to maintain adequate depth to permit continuation of the present level of navigation in the area to be dredged.	Page 34	Relies on a finding that: The proposal permits the continuation of the present level of navigation, affording it more efficiency and safety. No additional consideration is necessary.	Relies on a finding that: The proposal supports more than the "continuation of the present level of navigation." It proposes "enhancements" of the Channel. It enables larger ships at greater frequencies than at present levels.	There is some subjectivity in how the information on record is read and interpreted. Staff note that OAR 660-004-0022(8)(b) appears to be DLCD's attempt to balance the interests of protecting coastal resources and economic and navigation interests, and the rule was likely intended to preserve only the navigation rights that are in existence when the Exception application was filed. The applicant's interpretation should be carefully evaluated. Because this is a State rule, deference will not be given to a local interpretation.

Criteria	Report Page	Approval	Denial	Interpretation / Analysis
CBEMP Policy 5 -E. Consistent with other requirements of state and federal law.	Page 40	Relies on a finding that: It is reasonable to assume the proposal can meet the requirements of state and federal law. The proposal is consistent with the requirements of Goal 16 (Estuarine resources) because it represents a balance of estuary uses, protecting economic values of the estuary while minimizing adverse impacts. Permit issuance is conditioned on the completion of a Final EIS and the applicant obtaining all necessary DSL and Federal Section 404 Authorizations prior to any dredging activity.	Relies on a finding that: ODEQ's denial of JCEP's Water Quality Certification Permit includes evidence relevant to applicable local criteria for this application. The City cannot find the proposal is consistent with the CBEMP because it cannot show compliance with state turbidity requirements. (see ODEQ denial and Policy 5 E.) The City also cannot accept the applicant's reliance on the federally required EIS, until is finalized.	Similar to Goal 6, the City would have to find that it's reasonable that the proposal can meet state and federal laws. Staff believe a condition of approval is a possibility here. For the City to approve the applicant's proposal, a condition of approval would have to be included requiring an approved Water Quality Certification Permit. See Condition #1 and #4 and #13.

CONDITIONS OF APPROVAL
Should Council take action to approve Land Use application 187-18-000153, the following conditions of approval are recommended.

Condition of Approval #1: ***Prior to the commencement of any dredging activities, JCEP shall provide the City of Coos Bay Community Development Administrator evidence of an approved Section 401 Water Quality Certification permit and evidence that the dredging complies with FEIS requirements.***

Condition of Approval #2: ***JCEP shall receive written authorization to perform the proposed dredging from the National Marine and Fisheries Service in accordance with NMFS agency requirements. Proof of such authorization shall be submitted to the Coos Bay Community Development Administrator prior to the commencement of dredging activities.***

Condition of Approval #3*: Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall comply with the requirements of the enclosed MOA, CRPA, and UDP as agreed upon and signed by JCEP and the Confederated Tribes of Coos, Lower, Umpqua, and Siuslaw Indians, as well as consistency with any other provisions of Policy #18 of the CBEMP.*

Condition of Approval #4: ***Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall obtain, and provide evidence of, all necessary ODEQ, DSL and Federal Section 404 authorizations. JCEP shall provide the City with copies of these approved authorizations for the record.***

Condition of Approval #5*: As a general condition, and in the event that additional analysis or circumstance reveals relevant and previously unknown or unmapped shoreland resources, all dredging activity must remain consistent with CBEMP Policy #17 - Protection of "Major Marshes" and "Significant Wildlife Habitat" in Coastal Shorelands.*

Condition of Approval #6: ***As a general condition, dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit shall only occur during the ODFW approved in-water work window (IWWW) which occurs between October 1 and February 15. JCEP shall remove all equipment associated with dredging activities at the expiration of the IWWW. This condition shall remain in effect for all dredging periods that may span multiple years and multiple IWWWs.***

Condition of Approval #7: ***Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities Permit, JCEP shall submit for review and approval by the City of Coos Bay Public Works/Community Development Department, the Best Management Practices, and compliance with CBMC Chapter 9.20 to minimize impacts.***

Condition of Approval #8: ***Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities Permit, JCEP shall submit for review and approval by the City of Coos Bay Public Works/Community Development Department Best Management Practices that will be employed should turbidity levels remain above ambient background levels greater than 200 feet from dredging operations.***

Condition of Approval #9: ***As a general condition, JCEP shall ensure all floating and submerged dredging equipment operating in the Bay shall be clearly marked with day signals and light signals at night in accordance with the US Inland Rules of the Road.***

Condition of Approval #10: ***As a general condition, JCEP construction safety inspectors shall be on-site during any time dredging operations are underway and shall be responsible for warning any recreational boaters who enter the construction area.***

Condition of Approval #11: ***As a general condition, JCEP shall ensure that sections of the pipeline that cross the Federal Navigation Channel (FNC) are submerged on the FNC bottom to allow for vessel passage. The sections of floating pipeline shall be temporarily removed to allow for vessel passage, when necessary.***

Condition of Approval #12: ***As a general condition, JCEP shall be responsible for costs of City review of information associated with project conditions.***

Condition of Approval #13: Prior to the issuance of an Estuarine and Coastal Shoreline Uses and Activities Permit, JCEP shall provide the City of Coos Bay Community Development Administrator evidence of an approved Final EIS.

Condition of Approval #14: City of Coos Bay Public Works has identified an existing utility that is installed under the Bay in the vicinity of the proposed navigational reliability improvements. Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall provide evidence to the Coos Bay Community Development Director, that the proposed dredging activity shall not impact this existing utility.

STAFF CONCLUSION

Council should carefully review the application itself (attached to the staff report), the application criteria, the analysis within the staff report (including referenced exhibits), and the recommendation by the Planning Commission. The Planning Commission recommended approval findings for the 7 Key Criteria or "Pivot Points" identified in this memo. Based on the evidence currently in the record, it is LCOG's perspective that, although some subjectivity exists, a recommendation for denial is the more supported conclusion.

ACTION BY THE CITY COUNCIL:

Following are a number of motion alternatives for the Coos Bay City Council related to the public hearing:

1) A motion to continue the hearing to a future date (should be based on a clear need to allow more time for oral testimony)
2) A motion to close the hearing

Following are a number of motion alternatives for the Coos Bay City Council related to the record:

1) A motion to keep the record open for a date certain. This typically involves establishing the following distinct open record periods:
    a. 1st Open Record Period – open to any new testimony
    b. 2nd Open Record Period – open only to testimony addressing issues raised in 1st Open Record Period.
    c. Final Open Record Period – A opportunity for the applicant to make final written arguments
2) A motion to close the record. Because this is the second evidentiary hearing on the application, the Council is not obligated to accommodate a request to keep the record open. It may close the record or keep it open at its discretion.

As indicated earlier in this memo, while Council will make a motion to approve or deny each of the four requested applications of the applicant, it's highly unlikely the applicant will be able to proceed with the proposed NRI #4 if all four requests are not approved. Each request of the applicant is related and dependent on the other requests.

If the hearing and record are closed, the following are motion alternatives for the Coos Bay City Council related to deliberations and decision making:

1) A motion to approve some or all of the four requested actions based on findings of approval and conditions of approval (including additional/new conditions of approval).
2) A motion to deny some or all of the four the requested actions based on findings of inconsistency with one or more the approval criteria.
3) A motion to hold off on deliberations and/or final action until more information is received. Note that a recommendation on the permits related to dredging cannot be supported without amendments to the map and text amendments to the comprehensive plan.

Although Council deliberations can be general to the four applications, there should be separate motions and votes on final decisions for each of the four requested applications.

CITY OF COOS BAY
Public Works/Community Development Department

500 Central Avenue
Coos Bay, OR 97420

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STAFF REPORT
Type III – Land Use Process
Jordan Cove Energy Project – Navigational Reliability Improvements

STAFF: Henry Hearley, Assistant Planner, Lane Council of Governments (LCOG)
Jacob Callister, Principal Planner, LCOG
Anne Davies, Principal Attorney, LCOG
Carolyn Johnson, Community Development Administrator, City of Coos Bay

REVIEW BODY: City Council

MEETING: Tuesday, August 27, 2019 at 6:00 p.m.

LOCATION: Coos Bay City Council Chambers, 500 Central Avenue, Coos Bay, Oregon

APPLICANT/OWNER: Jordan Cove Energy Project L.P. (JCEP)
Attention: Meagan Masten, 111 SW 5th Avenue, Suite 100, Portland, OR, 97204

APPLICANT'S REPRESENTATIVE: Perkins Coie LLP, 1120 NW Couch Street, Tenth Floor, Portland, OR 97209; Attention: Steven Pfeiffer

SUBJECT PROPERTY : T 25S R 13W Sections 8, 17, 19, 30; T 25R 14W Sections 25, 35, 36.

SUBJECT: LAND USE APPLICATION #187-18-000153 – Jordan Cove Energy Project Navigation and Efficiency and Reliability of the Coos bay Deep Draft Navigation Channel

APPLICATION ATTACHMENTS AND EXHIBITS: See http://coosbay.org/departments/community-development-department under "Notable Projects" Jordan Cove.

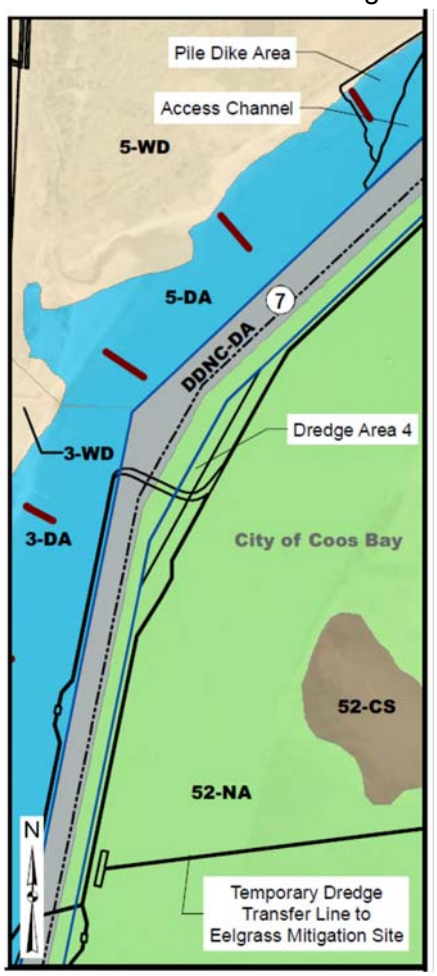
I. BACKGROUND/CONTEXT

Staff outline of the process followed to date with respect to City of Coos Bay Land Use Application #187-18-000153.

- November 21, 2019 - City received Land Use Application from Perkins Coie, the applicant's representative. Following submittal, City of Coos Bay staff contract with LCOG to help process the application. A 30-day completeness review of the application ensues.
- December 20, 2019 – LCOG issued a "letter of incompleteness" requesting clarification and additional information with respect to their submittal.
- February 4, 2019 – Applicant's representative submitted the additional information and clarification on items requested. Staff reviewed the information.

- February 12, 2019 – LCOG issued a "letter of completeness" for Land Use Application #187-18-000153.
- March 21, 2019 – First evidentiary public hearing held in front of City of Coos Bay Planning Commission. The public hearing was closed. A request for the record to be left open was requested and granted.
- March 22 – April 25, 2019 - First open record period.
- April 26 – May 16, 2019 – Second record period limited to issues raised during the first open record period.
- May 23, 2019 – Applicant issued their final written arguments in support of the application.
- July 23, 2019 – City of Coos Bay Planning Commission meeting to hear testimony received and deliberate on the matter. Planning Commission made motions to recommend approval of all four of the applicant's requests with a vote of four in favor and two in opposition. The Planning Commission's recommendation reflected affirmative findings for the "Key Criteria" identified by staff in the Agenda Item Summary, as well as the Conditions of Approval as proposed.

The Coos Bay Deep Draft Navigation Channel (Channel) serves a vital purpose in providing the only safe vessel access to and from Coos Bay and the Pacific Ocean for marine terminals located along the Bayfront. The Channel was initially authorized in 1899 and since then has undergone ten modifications. Most recently, the Channel was expanded from -35 feet to -37 feet in 1997 to allow for the safe navigation and transit of Coos Bay for the size of ships prevalent during that time period. Over the last 20 years the dimensions and tonnage of ships serving terminals in Coos Bay has increased. The size of vessels typically calling on Coos Bay terminals has increased from an average of 45,422 Metric Tonnes to an average of 52,894 Metric Tonnes with a projected near-term vessel size of 70,400 Metric Tonnes. Currently, environmental conditions, including wind, fog, and currents, coupled with the increasing ship size explained above, have caused the Coos Bay Pilots Association ("Pilots") to impose more limiting restrictions on when vessels may safely transit the Channel. These restrictions, in turn, cause significant delays and increased pressure on the Pilots to navigate ships through the Channel. Delays are measured in the total transit time; from the time the vessel arrives off the coast of Coos Bay until it returns offshore after calling at its local Coos Bay destination. These delays generally decrease the efficiency and competitiveness of maritime commerce on a global scale, thereby jeopardizing continued success for maritime commerce in Coos Bay. Minimizing delay is a pressing need because companies that utilize the port of Coos Bay have identified potential new customers in Asia that desire to export cargo using bulk carriers that are slightly larger than the ships typically calling today. Various marine terminal businesses within Coos Bay require assurances that terminals can efficiently accommodate larger dimension bulk carriers in the future.



The Coos Bay Estuary Management Plan (CBEMP)

To comply with Statewide Planning Goal 16 Estuarine Resources, Coos County, City of Coos Bay and City of North Bend developed the CBEMP. It was adopted and acknowledged in 1984. Goal 16 requires that all areas within an estuary be classified into management units in the estuary

management plan. There are three “aquatic” management units in the CBEMP: Natural Aquatic (NA), Conservation Aquatic (CA) and Development Aquatic (DA). This application proposes an amendment to change an area of the Coos Bay Estuary from Natural Aquatic (NA) to Development Aquatic (DA).

According to the CBEMP, Natural Aquatic areas are managed for resource protection preservation and restoration. They place severe restrictions on the intensity and types of uses and activities allowed within them. Natural Aquatic areas include tidal marshes, mud-sand flats, seagrass and algae beds that, because of a combination of factors such as size, biological productivity and habitat value, play a major role in the functioning of the estuarine ecosystem. Natural Aquatic areas also include ecologically important subtidal areas.

Development Aquatic areas are managed for navigation and other water-dependent uses, consistent with the need to minimize damage to the estuarine system. Some water-related and other uses may be allowed, as specified in each respective unit. Development Aquatic areas include areas suitable for deep or shallow-draft navigation (including shipping and access channels or turning basins), sites and mining or mineral extraction areas, and areas adjacent to developed or developable shorelines which may need to be altered to provide navigational access or create new land areas for water-dependent uses.

Dredging
Dredging, or “Navigational Reliability Improvements” (NRIs), could increase the operational window to safely transit any vessel through the Channel. The NRIs, which are described in more detail below, are designed to increase the environmental operating windows for all ships entering Coos Bay by softening critical turns, relocating aids to navigation and reducing the required Channel directional changes. The NRIs are designed to reduce entry and departure delays and allow for more efficient vessel transits through the Channel for the size of vessels entering the Port today.

All work associated with the NRIs will take place during the approved in-water work period for Coos Bay (October 1 to February 15). The applicant notes that JCEP will place initial and future dredged material derived from the NRI Sites at the APCO 1 and 2 sites near the southern terminus of the U.S. Highway 101 McCullough Bridge. These sites are located in the City of North Bend; JCEP will file a separate application with that City to authorize disposal of these dredge spoils in these locations. If dredging by hydraulic methods, JCEP will utilize a 24- to 36-inch temporary dredge pipeline to transport the dredged material to the disposal sites on the bottom or horizontal extent of the Channel to reduce potential conflicts with vessel navigation. The maximum distance from the NRIs to the APCO sites is approximately 8.3-miles. The dredge line is illustrated in Attachment A, Exhibit 6. Booster pumps would be required to move the material to the disposal sites through the pipeline.

The NRIs will facilitate economic opportunities, including access to emerging opportunities to export products with today’s larger vessels, including bulk carriers. Although log export vessels serving the upper bay are smaller, the proposed enhancements also benefit these vessels by broadening the tidal and environmental windows for transiting the Channel, providing an enhanced margin of safety and improved efficiency in the loaded vessel departure schedule. Both Roseburg Forest Products and the Pilots have submitted letters of support for the NRIs. See Attachment A, Exhibit 3. For JCEP and its LNG terminal, the NRIs will allow for transit of LNG vessels of similar overall dimensions to those listed in the July 1, 2008 United States Coast Guard (“USCG”) Waterway Suitability Report, the USCG Letter of Recommendation dated May 10, 2018 and USCG letter confirmation dated November 7, 2018 see Attachment A, Exhibit 4, but under a broader range of weather conditions, specifically higher wind speeds. As a result, JCEP estimates

that, upon completion of the NRIs, JCEP will be able to export the full capacity of the optimized design production of the LNG Terminal on a consistent annual basis.

II. APPLICANT'S REQUEST

JCEP proposes dredging at four locations in the Channel. Three of the proposed NRIs are within Coos County and one (NRI - Dredge Area #4) is within the City of Coos Bay. The applicant is requesting a goal 16 exception because it's required in order to execute the proposed Post Acknowledgement Plan Amendment (PAPA) for the Department of Land, Conservation and Development (DLCD) specifically, the rezone of 3.3 acres of an aquatic unit currently zone NA-52 to DDNC. The applicant is proposing the following application to that end:
(1) A map amendment (Comprehensive Plan and Zoning maps) to the Coos Bay Estuary Management Plan to change the designation of approximately 3.3 acres from 52-NA to DDNC-DA;
(2) A text amendment to the City of Coos Bay Comprehensive Plan to take a reasons exception to Statewide Planning Goal 16 Estuarine Resources to authorize the map amendment;
(3) An estuarine and coastal shoreline uses and activities permit for "New and Maintenance Dredging" in the DDNC-DA Estuarine Zone; and
(4) An estuarine and coastal shoreline uses and activities permit to allow an accessory temporary dredge transport pipeline in the 52-NA, 53-CA, 54-DA, and 55-CA Estuarine Zones.

III. NOTICES AND REFERRALS

Notice:

On May 23 and June 13, 2019 notice for the July 23 Planning Commission meeting was mailed to surrounding property owners along the shoreline adjacent to the proposed NRI sites. The Coos Bay Municipal Code (CBMC) doesn't outline specific noticing requirements for a subject property located in a body of water. City staff mirrored the notice approach used by Coos County for the three associated NRI dredge sites being concurrently evaluated. The County mailed notice to bayfront properties adjacent to the proposed NRIs. The City mailed notice to bayfront properties within the City Limits. Notice was also sent to concerned parties that contacted city staff indicating they would like to receive notice.

Notice for the Planning Commission meeting was also published in "*The World*", on May 25 and June 29, 2019. Notice for the City Council August 27 public hearing was published July 6, 2019 and August 10, 2019.

Staff also provided required notice to DLCD for a post acknowledgement plan amendment on February 12, 2019. Staff have also been in touch with DLCD's Goal 16 specialist, Matt Spangler, (now retired) and Heather Wade.

Referrals:
On March 1, 2019, referral notice was sent to the following governmental/utility/tribal agencies for a request for comment on the application: Department of Land Conservation and Development (DLCD), Department of State Lands (DSL), Coos Bay North Bend Water Board, NW Natural, Pacific Corp, Coos County, City of Coos Bay, Oregon International Port of Coos Bay, and Confederated Tribes of Coos, Lower, Umpqua and Siuslaw Indians and Coquille Tribe.

The City of Coos Bay Public Works issued a comment indicating that the proposed dredging appears to be at or near Station 280+00 (Figure 1 of 9). The City has an existing utility line at or near this station installed under the Bay. Staff recommends the proposed dredging shall not

impact this existing utility line; this requirement is noted as a condition of approval in Section VIII of this staff report.

Coos Bay Public Works also requested that it be the responsibility of the applicant to ensure that all applicable resource agency permits and approvals are obtained prior to commencement of any work. Staff recommends the condition to obtain appropriate permits prior to any proposed dredging activities. This and all conditions of approval can be found in Section VIII of this staff report.

Staff sent Oregon Department of Fish and Wildlife (ODFW) referral comment on August 2 to provide comment on the Tribe's comment of shortening the In-Water Work Window (IWWW) by approximately two weeks. To date, staff has not received comment from ODFW.

IV. Public Comments and Testimony

First Open Record Period

The Planning Commission held a public hearing on the application on March 21, 2019. During the hearing the public had an opportunity to submit oral and/or written testimony in favor or opposition of the proposal. At the public hearing two parties provided oral testimony in favor the of the proposal and 17 in opposition, and one neutral. Including the testimony presented during the public hearing, Staff also received written testimony from several interested parties during the first open record period. At the close of the first open record period at 5PM on April 25, Staff had received 38 comments with six in favor and 31 in opposition and one neutral. Just before the closing of the first open record period, the applicant submitted an approximately 17,000-page comment letter.

With regards to entering the public testimony and the applicant's submission into "the record", the Coos Bay Municipal Code (CBMC) is silent on this matter. The Oregon Land Use Board of Appeals (LUBA) dictates that the record consists of everything that is "placed before, but not rejected by the decision maker." "Placed before" used to mean hard copies; however, this now means something different. The entire record has been posted online available for the decision makers and public to freely view. For individuals that do not have internet access or a computer, a hard copy of the record can be provided at the cost of printing. For this reason, the City is proposing not to print the entire record, which would be in excess of 20,000 pages and place it into a box and "place it" before the decision makers at subsequent meeting and or hearings.

Staff has reviewed the public comments and provided a summary of points raised consistently below. A complete list of all comments and their synopsis can be found in Attachment D, to read the entirety of comments please refer to the City's website under "Notable Projects, Jordan Cove" at http://coosbay.org/departments/community-development-department. Analysis of these issues are presented in the evaluation of the related approval criteria where such criteria exists.

Fish and Wildlife

Many comments warned that the proposal is detrimental to native species found in the Estuary, including species that commenters believe are not adequately addressed by the applicant such as Dungeness crab and several species of Salmon. Several comments also address the crippling harm the proposal could have on recreational and commercial crabbing, clamming and fishing. Commenters assert the on-going dredging will continue to be a disturbance to the natural ecosystem, including loss in habitat for native species.

The Public's Interest
Numerous public comments suggest that the applicant has not provided evidence sufficient to support claims that the proposal is in the public interest. Numerous opponents point out JCEP's own suggestion that there will be a 1%-2% increase in LNG export as a result of straightening of the Channel. Opponents argue that this does not constitute a public need or a public interest that outweighs harm to the natural ecosystem and recreation.

Demonstrated Need
Numerous public comments suggest that the applicant has not provided evidence sufficient to support claims that a "demonstrated need" in support of Goal 9 (Economic Development) and Goal 12 (Transportation) exists. Opposition testimony asserts that the applicant has failed to provide sufficient evidence of an economic analysis to support its claim of an "economic boon" and that a general desire to reduce transit delays in the Bay does not qualify as a demonstrated need sufficient to warrant a Goal 16 exception.

Concurrent Applications
Opponents have pointed out the City should consider the concurrent land use applications submitted by JCEP in other jurisdictions to include Coos County and the City of North Bend and that a failure to do so is a failure of Oregon Statewide Planning Goal 2 – Land Use Planning. Opponents note that a land use decision that only addresses a portion of the activities required to accomplish the project is insufficient.

Coast Guard Letters of Support
Several public comments point to the applicant's submittal of a "letter of support" from the Coast Guard that states, *"I recommend the Coos Bay Channel be considered suitable for LNG marine traffic."* Given this letter from the Coast Guard, opponents have questioned the applicant's assertion that the proposed NRI is required and necessary. Similarly, a letter to JCEP dated November 8, 2018 from the Coast Guard documented that simulated transits by Coos Bay Pilots demonstrated they could safely and successfully maneuver LNG carriers up to 299.9 meters (983.3 feet) in length and 49 meters (160.8 feet) in beam and 11.9 meters (39 feet) in draft.

Goal 16 Exception
Opponents assert the applicant has not met criteria for a Goal 16 exception. Specifically, the requirement to show the proposed uses are compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts as indicated in OAR 660-004-0020 (d). Opponents note the applicant fails to address this requirement as they only cite the Channel itself as an adjacent use, and do not address the impacts on the NA-52 Natural Aquatic Unit that would be adjacent to the proposed NRI.

Also refuted by numerous opponents is the applicant's advancement, under OAR 660-004-0022(8)(b), of a "reason" to support their Goal 16 exception that the dredging is to *"maintain adequate depth to permit continuation of the presently authorized level of navigation at the NRI site."* Comments assert this provision is only applicable to maintenance dredging, not to an expansion of a channel into new areas presently designated as a natural aquatic management unit. Lastly, opponents assert the applicant has not provided evidence sufficient that the current Channel is inoperable without dredging in the adjacent natural aquatic management area or that the proposed NRI is required for continued use of the existing Channel.

Cumulative Effects
Comments have been received relating to the need for the City to consider the cumulative effects as outlined in the CBMC Section 17.360.010 Comprehensive Plan Amendment *"The approval body shall consider the cumulative effects of the proposed comprehensive plan and/or map amendments on other zoning districts and uses within the general area."* Opponents argue the proposal would have negative cumulative effects on health and welfare. Opponents also point out that the applicant is only considering the effects on NRI site #4 and assert that the applicant should be considering the cumulative effects on the Estuary.

Navigation Safety
Comments were received noting the proposed NRIs are required because over the last 20 years, tonnage of ships serving terminals in Coos Bay have increased. The size of vessels typically calling on Coos Bay terminals have increased from an average of 45,422 Metric Tonnes to an average of 52,894 Metric Tonnes with a projected near-term vessel size of 70,400 Metric Tonnes. Safe and efficient vessel transport considerations due to environmental conditions, including wind, fog and currents, coupled with the increasing ship size have caused the Pilots to impose ever more limits restrictions on when vessels may safely enter and transit the Bay. These delays are decreasing the efficiency and competitiveness of maritime commerce on a global scale and if not addressed will continue to jeopardize maritime commerce in Coos Bay. Comments indicate the proposed NRIs are designed to reduce entry and departure delays and allow for safer vessel transit through the Bay for the size of vessels entering the Port today.

Second Open Record Period
A second open record period began on April 26 and closed on May 16. Comments and testimony submitted during this period were limited to issues raised during the first open record period. During the second open record period, one comment was received in favor of the proposal, one comment seeking procedural clarification, and seven comments in opposition. One of the seven opposition comments did not include any responses to any issues raised during the first open record period. Staff reviewed the public comments and provides a summary below of points raised. A complete list of all comments can be found in Attachment E.

Size of Applicant's First Open Record Submission (Oregon Statewide Planning Goal 1 implications)
Comments were received related to the applicant's submission near the close of the first open record period, which is nearly 17,000 pages in length. Concerns were expressed by the public that there is no way they, staff, nor the Planning Commission could adequately review and process a submission of that size. A related comment was received about the inability of the public to successfully access (download) the large file and about the technical jargon found in the document being contrary to the accessibility intentions of Oregon Statewide Planning Goal 1. As a result of the inability to review the large first open record period submission Staff worked with the applicant to postpone the previously scheduled May 30 Planning Commission meeting until July 23. Comment was also received contending that the applicant's large nearly 17,000-page first open record period submission is primarily existing information that should have been submitted with the applicant's initial application, and as a result fell short of providing information sufficient to evaluate applicable criteria.

Oregon Department of Environmental Quality (ODEQ) Denial of 401 Water Quality Certification
Comment was received urging the City to consider ODEQ's decision that the applicant's proposal (related to the entire larger Jordan Cove project) does not have reasonable assurances that the construction and operation of the project will comply with applicable Oregon water quality standards. ODEQ's review considered the potential adverse impacts arising from the applicant's proposed new and maintenance dredging activities associated with the proposed NRIs and

denied the certification because it did not *"have reasonable assurance that the construction and operation of the Project would comply with applicable state water quality standards."*

No Additional Evidence to Meet a Goal 16 Exception or Establishes a "Demonstrated Need"
Opponents of the proposal note that the applicant's rebuttal and second open record period submission continues to be inadequate in addressing applicable approval criteria sufficient to authorize a Goal 16 exception.

Draft Environmental Impact Statement (DEIS)
Comment was received regarding the applicant's use of the DEIS that was issued by the Federal Energy Regulatory Commission (FERC) for Jordan Cove on March 29, 2019. Comment alleges the Final Environmental Impact Statement (FEIS) is not expected until January 2020, and that the EIS cannot be relied upon until finalized. Opposing comments also note that the applicant fails to provide context or explanation for the DEIS document in the record.

V. APPROVAL CRITERIA

Coos Bay Development Code (CBMC)
17.360.010-Comprehensive Plan Amendment
17.360.020-Initiation of Amendment
17.360.060-Appeal Criteria
17.352.010-Estuarine/Coastal Shore Activities

Coos Bay Comprehensive Plan (CBCP)
Section 7.1 Natural Resources and Hazards Strategies NRH.8 and NRH.9
Section 8.3 Land Use and Community Development Planning Strategies LU.4, LU.5 and LU.7
Section 7.5 Economic Development

Coos Bay Estuary Management Plan (CBEMP) Policies
DDNC-DA Zone – General Conditions for Approval of "New and Maintenance Dredging"
DDNC-DA Zone – Special Conditions for Approval of "New and Maintenance Dredging"
CBEMP Policy #17 – Protection of "Major Marshes" and "Significant Wildlife Habitat" in Coastal Shorelines
CBEMP Policy #18 – Protection of Historical and Archaeological Sites within Coastal Shorelands
CBEMP Policy #5 – Estuarine Fill and Removal

Statewide Planning Goals
Goal 1: Citizen Involvement
Goal 2: Land Use Planning
Goal 6: Air, Water and Land Resources Quality
Goal 9: Economic Development
Goal 12: Transportation
Goal 13: Energy Conservation
Goal 16: Estuarine Resources

Reasons Exceptions (Oregon Revised Statute and Oregon Administrative Rules)
ORS 197.732 – Goal Exceptions
OAR 660-004-0020- Criteria for Goal 16 exceptions
OAR 660-004-0022- Criteria for Goal 2 exceptions

VI. EVALUATION OF APPROVAL CRITERIA FOR COMPREHENSIVE PLAN AMENDMENT

COOS BAY MUNICIPAL CODE (CBMC)

CBMC 17.360.010 Comprehensive Plan Amendment

A. The boundaries of the Comprehensive Plan map designations and the Comprehensive Plan text may be amended as provided in CBMC 17.360.020 of this title.

Staff Response: The subject property lies within the Coos Bay Estuary, and falls under the ownership of the DSL, the applicant has requested and received permission to file this land use application with the City of Coos Bay. The DSL letter is included in the record. The application includes a request for an exception to Goal 16, requiring a comprehensive plan text amendment.

B. The City may amend its Comprehensive Plan and/or plan map. The approval body shall consider the cumulative effects of the proposed Comprehensive Plan and/or map amendments on other zoning districts and uses within the general area. Cumulative effects include sufficiency of capital facilities services, transportation, zone and location compatibility, and other issues related to public health and safety and welfare the decision-making body determines to be relevant to the proposed amendment.

Discussion: Neither the CBMC, nor the CBCP provide a definition of "cumulative effects." The definition provided by the National Environmental Policy Act (NEPA) is as follows:

Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these effects, and any resulting environmental degradation, that should be the focus of cumulative impact analysis. While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time. Thus, the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity (federal, non-federal, or private) is taking the actions …Effects and impacts are used synonymously.

The applicant advances a number of positive cumulative effects of such an amendment, including facilitating an increase in safety and efficiency of navigation in the Channel. The Applicant also asserts that a cumulative effect of the proposal is to augment transportation in the bay. The applicant's assertion is that the proposal is not expected to have cumulative effects on the sufficiency of capital facilities services, or health and welfare.

A number of public comments were received which counter the applicant's assertion. In a comment received by the Oregon Shores Conservation Coalition (OSCC), they point out that the applicant has not provided evidence sufficient to evaluate its claim that the proposed activities *"would facilitate an increase in safety and efficiency of Navigation in the Channel."* Additional comment from concerned individuals assert the applicant has not considered the cumulative effects of such an amendment on the entire Estuary.

The applicant re-affirms in their final written arguments that the issue before the City is limited and involves compliance with the applicable criteria for a comprehensive plan and zoning map amendments and rezoning of the proposed area as well as the proposed Estuarine permits for dredging related to NRI #4. The scope of this application does not include NRI #1 through #3, upland deposition of dredge spoils at APCO 1 and 2 sites, dredging of the slip and access

channel, Kentuck Eelgrass Mitigation Site, or any other aspect of the project, all of which are subject to other local, state or federal permits.

Staff Response: Public comments have advanced numerous potential cumulative (and direct) impacts of the proposed dredging. Some of these may not appear to be specifically addressed by the applicant. With respect to cumulative effects, The City application only involves the identified 3.3 acres zoned NA-52, subject to the City's jurisdiction. In rendering a decision on this application, the local decision maker may only address impacts resulting from the activities proposed by this City application alone. The City Council is not allowed to consider impacts based on other applications for other activities that are not presented as part of this application. The Council is also required to make the decision based solely on the applicable criteria that are found in the local code and comprehensive plan. Those criteria only require that the approval body "consider" the cumulative effects of the proposal under review; i.e., the proposed dredging at NRI site #4. By conducting the hearing and issuing a recommendation, the Council has necessarily considered the cumulative effects.

CBMC 17.360.020 Initiation of Amendment

Amendments of the Comprehensive Plan text or map, zoning map, or this title may be initiated by the following:

A. A Type III application, CBMC 17.130.100, Procedures, by one or more owners of the property proposed to be changed or reclassified consistent with the adopted Comprehensive Plan; or

B. A Type IV legislative process, CBMC 17.130.110, Procedures, by motion of the Planning Commission and adoption by the City Council.

Discussion: The underlying landowner of the subject estuary property is DSL, which has given the applicant permission to file this application as seen in the record. Comment was submitted related to the ownership dynamic of the Estuary. Jordan Cove does not contend they're the owner(s) of the Estuary. They obtained and verified permission from DSL to submit the land use application in question.

Staff reviewed public comments raised regarding "ownership" and the initiation of the application as submitted by JCEP. CDMC Section 17.360.020(1) provides that, for Type III applications, initiation of a plan amendment (such as approval of an exception) by one or more of the property owners. Opponents allege that the property owner is DSL, and not the applicant, and that DSL must sign the application. The applicant's argument is that it has obtained permission from DSL, and that is enough. This issue is a matter of local code interpretation. The City may interpret what is meant in the code by "initiation". Staff points to a case out of Coos County related to the JCEP pipeline in which, county code clearly required that applications be submitted by the property owner and that they "shall include the signature of all owners of the property." The CBMC code has a similar, yet less clearly stated, requirement for permit applications as shown in CBDC 17.130.050(2)(f), which calls out a proof of ownership document as sufficient for "technical completeness". The CBMC does not specifically require that the property owner sign the application; it merely requires that the application include proof of ownership.

Staff Response: The City could interpret CBMC 17.360.020(1) regarding "initiation" to allow a property owner to merely authorize the application without actually signing the application form. The goal of the code provision is to simply make sure the property owner is aware of the request. Staff finds that applicant has done that.

The proposal will still need to be signed off by DSL before any dredging activities can occur. The applicant has a separate application submitted with DSL that is currently under review.

The application is quasi-judicial in nature because it involves a single landowner, a limited geographic area, is not City-initiated, and concerns the application of existing policies to a specific set of facts. Because state law requires local governing bodies to take final action to approve any post-acknowledgment (text) plan amendment (*Housing Land Advocates v. City of Happy Valley, Or LUBA (LUBA No. 2016-031, May 23, 2016*), and the final decision on the application must be rendered by the City Council. The Planning Commission has recommended City Council approval of this application. The City Council is holding an entirely new public hearing in which the Planning Commission's recommendation will be considered as well as review all previous testimony and comments received. The Council will also accept new testimony and comments from the public and the applicant's representative.

CBMC 17.360.060 Approval Criteria

A. For a Type III or Type IV review, the City Council shall approve the proposal upon findings that:

1. The proposed amendment is consistent with the applicable policies of the Comprehensive Plan or that a significant change in circumstances requires an amendment to the plan or map,

Staff Response: The application to change the CBCP designation of the NRI Site from NA-52 to DDNC-DA is consistent with the applicable policies of the CBCP. Consistency with specific applicable policies is discussed below:

Section 7.1, Natural Resources and Hazards, Strategy NRH.8
Coos Bay shall encourage the preservation and protection of riparian vegetation as an important fish and wildlife habitat and as a viable means of flood control by enactment of appropriate property development ordinances providing protection by establishing buffer strips along waterways, along designated HUD floodways, with the exception of navigable waterways. This strategy recognizes that such land use practices are necessary (1) to preserve the area's natural resources, and (2) to eliminate unnecessary drainage and erosion problems often accompanying development.

Discussion: The Applicant asserts that the proposal does not include any impacts to City of Coos Bay shoreline habitat or riparian areas. The applicant anticipates possible temporary, but not permanent, impacts to shoreline habitat, including to riparian vegetation in the areas where the applicant plans to offload dredged material for processing, but they are not located within the Coos Bay city limits.

In their submitted testimony, the OSCC points out the applicant provides no meaningful data to evaluate a claim of no shoreline or riparian habitat and suggests the opposite may be true. Other comments submitted assert that the applicant's proposal will increase turbidity, water temperatures, and noise pollution, all of which have the potential to impose serious harm on estuarine organisms. Comments received suggest these are the types of cumulative effects the City must consider.

The applicant states that NRH.8 concerns the preservation and protection of "riparian vegetation". The location where the temporary dredge line related to NRI #4 will come in proximity of any shoreland habitat and riparian vegetation is not located within the City of Coos Bay's jurisdiction and therefore not subject to review under this application.

The applicant notes that they will comply with any regulations the City has implemented in accordance with its obligation to "encourage" preservation of riparian vegetation. The OSCC disputes this claim of the applicant that its only obligation is to "encourage" preservation of riparian vegetation, but rather the Section 7 of the CBCP includes "problem statements" that are "written to cite the reasons and justification of the policies and how they will be put into effect." The OSCC contends, the applicant should demonstrate that its proposals are consistent with the City's implementation of Policy NRH.8.

Staff Response: Staff concur with the applicant that although NRH.8 compels the City to "encourage" preservation and protection of riparian vegetation, it does not affirmatively obligate the applicant to take any action in pursuit of the City's strategies, goals, and issues.

Section 7.1, Natural Resources and Hazards, Strategy NRH.9
Coos Bay shall cooperate with local, state, and federal agencies in conserving and protecting fish and wildlife habitat, open spaces, and aesthetic and scenic values encompassed by areas enclose by the Coos Bay-North Bend Water Board, Empire Lakes, and Mingus Park. This strategy is not intended to prohibit development in these areas, but rather to ensure that if development occurs it takes into consideration the ability of the land to support such development, i.e., soils, topography, habitat, natural processes, etc. This strategy recognizes that these areas are particularly sensitive and valuable resources.

Staff Response: The policy creates no affirmative obligations for the applicant. In their submitted testimony, the OSCC asserts that the City should take into consideration the potential adverse and irreparable harm the proposal has on the natural resources contained in NA-52, and the estuary as a whole, prior to any recommendation of approval (consistent with CBMC 17.360.010). Staff conclude that Policy NRH.9 requires no affirmative action by the applicant.

Section 7.5 Economic Development
Goal 1, Policy 1.5 – Support and cooperate with community and regional partners to encourage economic growth.

Discussion: Approval of the proposed NRIs will primarily benefit large vessels that are navigating to and from the International Port of Coos Bay (Port). The Port itself is located outside of city limits, but is an important regional entity that facilitates mass export and import of goods and commodities overseas and thus serves as a key driver of economic development for Coos Bay and regions beyond. The applicant strongly asserts that the NRIs support community and regional partners and economic growth as the goal describes.

The applicant submitted an Economic Development Analysis for Operations prepared by ECONorthwest that provides an economic analysis for the broader project, however the report is not specific to NRI #4. In sum, the Economic Development Analysis outlines the total construction costs of the fully realized facility at approximately 9.7 Billion, with 2.8 Billion of the 9.7 Billion being spent directly at Oregon businesses. The analysis further asserts that the project will directly pay Oregon resident workers about $1.5 billion in compensation, in addition JCEP has agreed to a Community Enhancement Plan (CEP) under which property tax benefits available at the site would result in JCEP's payment of over 40 million dollars per year during operations, to be used for capital projects, including schools. The Economic Impact Analysis for Operations report is included in this staff report as Exhibit G.2. Further the applicant points to several comments received during the open record period from local businesses and business owners that show support for the proposed NRIs.

In their submitted testimonies, the OSCC, and several concerned individuals challenge that the proposed NRIs will only benefit LNG tanker transit, and that the applicant fails to provide evidence sufficient to support claims that the proposed NRIs would encourage economic growth in the City of Coos Bay in accordance with the vision of Section 7.5.

Staff Response: Insofar as Section 7.5 Economic Development, Goal 1, Policy 1.5 is concerned, the proposal is consistent with the goal. A further explanation of the economic development aspect of the applicant's proposal as it relates to Goal 16 exception criteria and showing a need based on Goal 9 later in this staff report.

Goal 6, Policy 6.1, 6.2 – Maximize the potential uses and benefits the waterfront and deep-water port offers to the city and region as a whole; Support the Port of Coos Bay In its development efforts for transportation linkage and to develop a deep-draft channel to accommodate large cargo vessels and increase shipping activities and water-dependent uses.

Discussion: Staff concur with the applicant's assertion that the purpose of this application is to facilitate increased navigational safety and efficiency for large vessels in the Channel. Increased safety and efficiency promote the Channel's economic benefits for the City and region as a whole.

Comments were received refuting the applicant's assertion that the purpose of the application is to facilitate increased navigational safety and efficiency In the Channel. Additionally, the OSCC contends the applicant's proposal is not consistent with Goal 6 because they have failed to provide sufficient evidence to evaluate their claim that the proposed uses and activities will *"facilitate increased navigational safety and efficiency for large vessels."*

Staff Response: In their final written arguments, dated May 23, the applicant re-asserts it's consistency with Goal 6, Policy 6.1 and 6.2, noting that the proposed NRI #4 will "maximize" the potential uses and benefits of the Port and Channel navigation by improving existing navigation of the Channel during a wider weather-window, and particularly as vessels at the current frequency increase in size. In response to the comments received about the failure to show the proposal will *"facilitate increased navigation safety and efficiency for large vessels"*, the applicant has submitted a technical memo from a Project Engineer (see Exhibit MM; Energy Conservation with NRI's in place) outlining "efficiency" measures the NRI #4 would provide. The memo does not go into depth about how the proposed NRIs specifically increase navigational safety.

Section 8.3 Land Use and Community Planning Strategy LU.4
Coos Bay shall not make major revisions to this Comprehensive Plan more frequently than every two years, if at all possible. "Major revisions" are those that have widespread and immediate impact beyond the subject area under consideration. The city recognizes that wholesale approval of frequent major revisions could ruin the integrity of the Plan.

Discussion: The applicant asserts that the proposal will not have impacts beyond the immediate dredge site.

In their submitted testimony, the OSCC challenges the applicant's claim that its proposal is not a "major revision" to the CBCP and suggest that they have provided no supporting evidence of that claim. The OSCC suggests that the request to change a zone from a Natural Aquatic Management unit, a unit that allows virtually no uses and is meant to be managed to preserve natural resources to a unit that allows more intensive uses, constitutes a major change.

In their final written arguments dated May 23, the applicant notes the proposal only impacts a 3.3-acre site is located at an isolated, undeveloped strip of submerged land adjacent to the Channel. The applicant has submitted technical memos (Exhibit II, JJ, HH, GG, EE, FF, and others) outlining that the area of NRI #4 is deep subtidal habitat (with no identified significant eelgrass, crustacean or shellfish populations) and will remain deep subtidal habitat after dredging activities. As confirmed by the technical memos, the effect of dredging will be limited in duration and limited in impact to the immediate NRI #4 area. Further, the applicant asserts, NRI #4 is already acclimated to navigation and dredging based on the location adjacent to the Channel.

Staff Response: This policy uses language with elements of subjectivity. The potential for widespread and immediate impacts from dredging may be a possibility. Regardless, the policy does not establish an outright prohibition on "major revisions," but rather limits such changes to no more than one every two years, "if at all possible," a qualifier which introduces additional subjectivity to that criteria.

City of Coos Bay staff confirm that there have been no major revisions to the CBCP within the last two years. Staff conclude that, regardless of the interpretation of "major revisions" the CBCP does not prohibit major revisions to the Comprehensive Plan if another "major revision" has not occurred within the previous two years.

Section 8.3 Land Use and Community Planning Strategy LU.5
Coos Bay may make minor changes to this Comprehensive Plan on an infrequent basis as need and justification arises. "Minor changes" are those which do not have significant impact beyond the immediate area of the property under consideration. The city recognizes that wholesale approval of frequent minor changes could ruin the integrity of this Plan.

Discussion: In their submitted testimony, the OSCC contends the applicant has not provided evidence sufficient to state "approval of the Application will not, from a land development/conservation standpoint, have a widespread, immediate, or significant impact beyond the NRI site, and it will not require additional changes to the Plan." The OSCC and several individual comments point to significant impacts beyond the immediate area of the property under consideration. These impacts include but are not limited to degradation and loss of eelgrass, increased water temperature, turbidity, noise pollution, loss of Dungeness crab, and several species Salmon populations.

In their final written arguments, dated May 23, the applicant echoes a similar response to that listed above under LU.4: The proposal is to make navigational reliability improvements to an isolated, undeveloped, and submerged price of land 3.3-acre area.

Staff Response: This policy uses language with elements of subjectivity. The potential for widespread and immediate impacts from dredging may be possible on an infrequent basis; however, it is unclear what constitutes an "infrequent basis." The policy does not establish an outright prohibition on "minor changes," but rather limits such changes to an "infrequent basis." Since a major revision is technically allowed, it is not clear how the distinction between major and minor revisions impacts an overall approval of the application. City of Coos Bay staff confirm that there have been no major revisions to the CBCP within the last two years.

Section 8.3 Land Use and Community Planning Strategy LU.7
Coos Bay shall anticipate that conflicts may arise between the various plan implementation strategies contained in the Plan when applying the policies to specific situations. To resolve these conflicts, if and when such may occur, Coos Bay shall consider the long term environmental, economic, social, and energy consequences

expected to result from applying one strategy in place of others, then to select and apply the strategy that results in maximum public benefit as supported by findings of fact. This strategy is based on the recognition that a viable conflict resolution process is essential to the success of any comprehensive plan.

Discussion: The OSCC states the applicant has not provided sufficient evidence to support its claim that approval of the application will not cause any conflicts between various CBCP implementation strategies.

In their final written arguments dated May 23, the applicant reiterates that the proposal will not cause any conflicts between various CBCP implementation strategies, and points to evidence currently in the record which addresses and finds consistent with all applicable policies of the CBCP, and the Goal 16 exception.

Staff Response: Staff agrees with the intent of LU.7 that if conflicts are shown and discernable, the City should consider the long term environmental, economic, social, etc. consequences expected to result and should favor the strategy with results that have the maximum (highest) benefit. Staff have not identified any specific and objective conflicts between implementation strategies.

2. The proposed amendment is in the public interest; and

Discussion: The applicant asserts that the proposed amendment to the CBCP serves a public interest by creating safer and more efficient navigation in the Channel, thereby promoting economic activity in the City of Coos Bay consistent with Comprehensive Plan Goal 1 Policy 1.5 and Goal 6, Policies 6.1 and 6.2. Promoting navigational safety and efficiency has support beyond the applicant, as indicated through letters of support submitted with the application materials (Attachment A, Exhibit 3).

The applicant has provided a response addressing environmental concerns negatively affecting public interests, which were raised in public testimony (Attachment A, Exhibit 5).

Several comments received by the public, disagree that the proposal is in the public interest. Comments received point to the applicant's failure to explain that the proposal will result in "increased navigational safety and efficiency for large vessels in the Channel." In addition, they point to the failure to describe how the proposal will result in an "economic boon" to the City and region. The comments suggest that the proposal will erode the land base in the Estuary that supports on-going ecological processes that sustain major sectors of the regional economy, including commercial and recreational fishing and crabbing, as well as potential harm imposed on commercial crabbing vessels. Comments contend, for these reasons, that the proposal is not in the public interest.

Staff Response: What's considered to be in "the public interest" is subjective. Staff have relied on case law as how to best interpret what is meant by "the public interest". Some cases seem to say the decision maker should first interpret what is meant by the phrase "in the public interest", to staff's knowledge this has not occurred. In another case, the city interpreted it to be met where all other criteria were satisfied, but not met where one or more other criteria are not satisfied.

Staff are inclined to interpret this as a "weighing of interests" relevant to the public. It seems clear to staff that the local government cannot simply conclude "yes, it's in the public interest." To approve the proposal, the City would need to adopt a finding explaining what is relevant to that determination, and present evidence in the record that is being considered in making the ultimate "public interest" determination.

3. Approval of the amendment will not result in a decrease in the level-of-service for capital facilities and services identified in the Coos Bay Capital Improvement Plan(s).

Discussion: The applicant has asserted that proposal will not result in a decrease in the level-of-service for any identified capital facilities and/or services identified in the Coos Bay capital improvement plan. The OSCC contends the applicant has not provided evidence sufficient to evaluate that the proposal "will not result in a decrease in the level-of-service for any identified capital facilities and/or services identified in the Coos Bay capital improvement plan."

Staff Response: There is no evidence in the record that the proposal will result in a decrease in the level-of-service for any identified capital facilities and/or services in the Coos Bay capital improvement plan. Thus, the applicant's assertion is valid.

Statewide Planning Goals

Statewide Planning Goals noted below are pertinent to the subject application.

Goal 1: Citizen Involvement – to develop a citizen involvement program that ensures the opportunity for citizens to be involved in all phases of the planning process.

Discussion: State law requires the local governing body to take final action to approve any post-acknowledgment comprehensive plan amendment before it can become final. The City Council is reviewing and will take and final action as a follow-up to the Planning Commission's review and recommendation. The City applied its Type III process pursuant to CBMC Section 17.130.100 to review and decide upon the Application, with the exception that they have provided for a hearing and final decision on the Application by the City Council. Upon doing so, the City will have complied with Goal 1. These procedures provide opportunity for citizen involvement in all phases of the application. Consistent with ORS 197.763, at the closure of the public hearing before Planning Commission on March 21, a request to leave the record open for the submittal of additional testimony was granted by the Planning Commission for an open record period up to April 25, 2019. At the conclusion of the first open record period, a second open record period commenced, limited to only issues raised during the first open record period. The second open record period closed on May 16, 2019.

At the close of the first open record period the applicant submitted an approximately 17,000-page document with the intention of including comprehensive evidence into the record. Opponents have raised two concerns regarding this large submission: (1) The mere size of the submission renders most readers, staff and decision makers incapable of reading and processing all the information given the limited time frame, and (2) The applicant had the information contained in the document the entire time and should portions of relevant information contained in the large document should have been included in their initial application submittal. The public's concerns were considered, and the City postponed the May 30 Planning Commission meeting by approximately 60 days and pushed back with City Council Hearing by approximately 90 days. Appropriate notice of these changes was sent and published.

Further, the City web site (Community Development page) has included information on the public review process for this application along with all related documentation.

Staff Response: The City of Coos Bay has adopted, within its Development Code, a program for post-acknowledgment plan amendments. The CBMC has been acknowledged by the Oregon Department of Land Conservation and Development (LCDC). This staff report affirms that required notice that has been issued. That program also includes the hearings that will take place

to address the application. The process and level of citizen involvement with respect to this application is consistent with Goal 1.

Goal 2: Land Use Planning – to establish a land use planning process and policy framework as basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Discussion: Goal 2 requires establishing a land use planning process and policy framework as a basis for all land use decisions and requires an adequate factual base for all land use decisions. In the present case, the provisions of the CBMC and the ORS establish the land use planning process and policy framework for considering the application. Further, the applicant has submitted materials, including narrative and supporting documentation, in the application with the intent to show consistency with applicable approval criteria. Goal 2 requires that the City coordinate its review and decision on the application with appropriate government agencies. In its review of the application, the City has provided referral notice to affected agencies with an opportunity to comment on the proposal. Referral comments received with respect to the proposal can be found under Section III of this staff report. Goal 2 also contains the rule and procedures for taking an exception to a statewide planning goal.

The OSCC states in their testimony that the applicant has failed to satisfy the applicable criteria and that the deficiencies shown in its application show that the proposal is therefore inconsistent with Goal 2. Individual comment was received relating to the deficiencies in the lack of coordination between the different jurisdictions involved in all four NRI sites. Comments suggest that it's a failure of Goal 2 that all four NRI sites are not considered in a coordinated manner by the respective jurisdictions.

In their submission comments, the OSCC holds that because the concurrent application fails to demonstrate that the comprehensive plan amendment is permissible, the request for Estuarine and Coastal Shorelands Uses and Activates Permit are unjustified. The OSCC states they may submit comment regarding the Uses and Activities Permit once the plan map amendment and zoning change have been resolved.

Comment was received regarding the ODEQ's decision to deny a Section 401 Water Quality Certification permit. The denial was based, in part, on the proposed project's failure to comply with City criteria and standards related to water quality. Comments also addressed the request of the applicant by Oregon Department of State Lands (ODSL) to address the concern that its proposed project fails to conform with requisite criteria in local comprehensive plan and land use regulations, including those in Coos County and the City of Coos Bay. Opposing testimony contends the applicant failed to meaningfully address these concerns in its response. In their final written arguments, the applicant addresses the ODEQ's decision to deny the Section 401 Water Quality Certification permit and how it's not relevant to the application at hand. Provided is an analysis of each point made by the applicant in their final arguments that requests the City to consider the following:

1) The decision by ODEQ to not certify compliance at this time is not relevant to the applications because it applies to the statewide turbidity standard as outlined in OAR 340-041-0036 which has not been adopted by the City and is not an approval criterion specific to any of the pending applications under the CBMC or CBCP.

Staff Response: Staff concur with the applicant that the OAR turbidity standard is not incorporated into the CBMC. As such, the opponent need not demonstrate that the OAR itself is an approval criterion. The Council could determine that the turbidity standard is the floor beneath which the application cannot fall in order to satisfy the applicable approval criteria – i.e., an

adverse effect that must be weighed in the ESEE analysis. This would be an interpretation of the CBMC and should be entitled to local deference. Also, CBEMP Policy #5 E provides "the activity is consistent with the objectives of the Estuarine Resources Goal and with other ***requirements of state*** and federal law, specifically the conditions in ORS 541.615." It could be argued that this provision brings in the OAR turbidity requirements.

ODEQ's decision concluded that, without the Dredge Pollution Control Plan, it was impossible to determine whether the state turbidity requirements were satisfied. The applicant has submitted a Dredge Pollution Control Plan in its first open record submittal. The Dredge Pollution Control Plan is dated April 8, 2019 and was completed by David Edwards and Associates. While staff are not privy to entire timeline of the ODEQ decision, ODEQ may not have had the Dredge Pollution Control plan to rely on when it rendered its decision because the record was not open to new submittal of evidence. While ODEQ may not have had the Dredge Pollution Control Plan to rely on when it rendered its decision, the applicant's experts on the subject matter says the Dredge Pollution Control Plan is sufficient, and to staff's knowledge no opponent testimony have been submitted to refute any of the findings and/or analysis contained in the Dredge Pollution Control Plan.

The Dredge Pollution Control Plan was submitted as (Exhibit BB, refer to City's website to view) part of the applicant's first open record period submittal on April 25, 2019.

2) The decision by ODEQ was under certain statuary time constraints and does not in any way preclude JCEP from re-submitting a complete application to DEQ in the future.

Staff Response: The contention here seems to be that, because the ODEQ found the applicant could re-apply, the denial cannot be used as a basis for denying the application. The applicant is correct in this assertion, the mere denial of the ODEQ permit does not necessarily dictate a denial of this application. The Council must determine whether the ODEQ permit denial somehow implicates an applicable approval criterion.

3) JCEP has included in the record a Dredge Pollution Control Plan as part of its April 25 first open record period submittal. The ODEQ decision to deny the permit was based on the lack of such plan to demonstrate compliance. However, the plan is now submitted into the record and if there is a question about whether JCEP has a plan to achieve "compliance with state turbidity standards" such evidence is in the record.

Staff Response: The applicant explains that the denial of the ODEQ permit was, in part, based on the absence of a Dredge Pollution Control Plan, which was necessary to determine compliance with the OAR turbidity standard. The applicant then states "JCEP recently completed the required Dredge Pollution Control Plan and submitted it into the record for the application on April 25, 2019" (11 days before the DEQ permit was denied). The applicant asserts that the record now does include a plan to achieve compliance with the OAR turbidity standards. As indicated above, the Dredge Pollution Control Plan may have been completed after the record had been closed, and therefore, the applicant could not submit it to ODEQ for consideration. Without evidence to refute the findings and analysis contained in the Dredge Pollution Control Plan, staff must accept its validity. Staff note that the Dredge Pollution Control Plan will have to be inevitably submitted, reviewed, and concurred with by ODEQ staff should JCEP reapply for Section 401 Water Quality Certification permit. Additionally, any recommendation for approval should be based on conditions of approval that require both a final EIS and an approved Section 401 Water Quality Certification permit, both of which have been included as conditions at the end of this staff report.

Goal 3: Agricultural Lands – to maintain and preserve agricultural lands.

Staff Response: The NRI site does not include any agricultural lands. Goal 3 is not applicable to this application.

Goal 4: Forest Lands

Staff Response: The NRI site does not include any forest lands. Goal 4 is not applicable to this application.

Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces

Discussion: Based on the information available to staff, the NRIs do not include any inventoried Goal 5 resources. In their submitted comments, the OSCC disputes the applicant's claim that there are no inventoried Goal 5 resources at the NRI site. The OSCC contends there are known Goal 5 inventoried resources, including the Henderson Marsh (a Goal 5 Major Marsh) and the Coos Head (an outstanding scenic resources) in the vicinity of the Coos Bay estuary which could be impacted by the applicant's proposal. They call upon the applicant to address consistency with Goal 5. The OSCC also asserts that staff's proposed condition of approval #5 is insufficient to address compliance with Goal 5.

Staff Response. Staff note that Henderson Marsh (a Goal 5 Major Marsh) and the Coos Head (an outstanding scenic resource) are "in the vicinity of the Coos Bay Estuary". As pointed out earlier in this staff report, the decision-making body by law, shall only consider the proposal as it relates to what's within the City's jurisdiction. NRI #4 is the only proposed dredging location under the City's jurisdiction. Absent comment showing a Goal 5 resource located within the 3.3-acre NRI #4, the applicant's response to Goal 5 is sufficient.

Goal 6: Air, Water and Land Resources Quality – To maintain and improve the quality of the air, water and land resources of the state.

Discussion: There are no administrative rules governing Goal 6; it relies entirely on state and federal regulations for direction and implementation. Goal 6 provides: "All waste and process discharges from future development, when combined with such discharges from existing developments shall not threaten to violate, or violate applicable state or federal environmental quality statutes, rules and standards."

The applicant's narrative indicates that JCEP has applied for state and federal approval of dredging activities at the NRI site. The applicant also notes that the proposed map amendments do not alter existing City protections provided by the CBEMP restricting dredging activities, which protections have been previously deemed consistent with Goal 6.

The applicant has submitted a biological assessment completed by the consultant David Evans and Associates (DEA). In its report (Attachment A, exhibit 5), DEA indicates Best Management Practices (BMPs) will be employed. The applicant identifies BMPs that will be utilized with the proposed dredging as a way to minimize impacts, a discussion of the BMPs can be found in Attachment A, Exhibit 5 (Page 7).

In their submission comments, the OSCC contends that the applicant concludes without providing evidence that *"these effects will be temporary, insignificant, or both, and JCEP will complete the NRI using methods to protect these resources."* They note that the applicant's assertion is somewhat in conflict with the DEIS in which FERC concludes that "*constructing and operating the Project would result in temporary, long-term, and permanent impacts on the environment."* The

OSCC also states staff's proposed condition of approval #3 is insufficient to address compliance with Goal 6. Additionally, comment was received during the second open record period submission relating to Goal 6 that indicates the applicant fails to demonstrate the proposal will not harm water quality in the state of Oregon as evidentiary in DEQ's decision to deny a 401-water quality permit.

Staff Response: When a property's comprehensive plan and zoning map designations are changed to allow a particular use of that property, Goal 6 requires the local government to adopt findings explaining why *it is reasonable to expect that applicable state and federal environmental quality standards can be met by the proposed use.* The function of Goal 6 is not to anticipate and precisely duplicate state and federal environmental permitting requirements. Rather, an applicant need only demonstrate that there is a reasonable expectation that the proposed use will be able to comply with applicable state and federal standards.

Given the evidence in the record, there is a reasonable expectation that the proposed use will be able to comply with state and federal standards. The ODEQ denial of a Section 401 Water Quality Certification was in part due to the absence of a Dredge Pollution Control Plan which may have been completed during a period when the record was closed therefore, ODEQ did not have the Dredge Pollution Control Plan to rely on. ODEQ's denial is a denial "without prejudice" meaning JCEP can re-apply and address concerns outlined in ODEQ's report. A resubmittal for a Section 401 Water Quality Certification would include the now completed Dredge Pollution Control Plan. Further, condition of approval #1 requires the applicant to obtain the state 401 water quality permit. With this condition, Goal 6 would be satisfied.

***Condition of Approval #1:* Prior to the commencement of any dredging activities, JCEP shall provide the City of Coos Bay Community Development Administrator evidence of an approved Section 401 Water Quality Certification permit, and evidence that the dredging complies with FEIS requirements and all other state and federal requirements**

Goal 7: Areas Subject to Natural Hazards. – To protect people and property from natural hazards.

Discussion: Goal 7 requires local governments to identify and plan for natural hazard areas and coordinate their natural hazard plans and programs with state agencies. The proposed uses and activities will not increase the likelihood of damage to people or property.

Comments received assert that during initial construction, anchored dredges and associated dredging materials, including temporary pipelines, present in the Bay, would potentially be a hazard for life and property in the Bay in the form of drifting debris. It is also noted that there may impairment to rescue operations in the event of an earthquake and/or tsunami, and that the expanded channel width and depth will enable tsunami waves to propagate more freely in the Estuary.

The applicant asserts compliance with Goal 7 *"because it will not increase the likelihood of damage to people or property within the City from natural hazards."* Comments received, affirm that it is insufficient for the applicant to make this claim without any meaningful discussion of the inventoried hazards or the applicable CBMC provisions. Comments were received relating to the earthquake and tsunami risk that lies just off the coast in the form of the Cascadia Subduction Zone.

Staff Response. There are no OAR's implementing Goal 7. The language of the goal itself is to *"protect people and property from natural hazards"* (reducing risks to life and property that are caused by natural hazards), Accordingly, it is aimed at primarily at limiting "development" in areas subject to natural hazards. As defined by goal 7 "Development" means the *"act, process or result of developing."* Even if the proposed activity is considered "development", the proposed use does not substantially increase risks of damage to persons or property from any possible hazardous event.

Goal 8: Recreational Needs – To satisfy the recreational needs of the citizens of the state and visitors, and where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

Discussion: The applicant asserts that the proposed NRI site #4 itself does not involve recreation or inventoried recreational areas, facilities or opportunities. Staff note that Coos Bay supports recreational activities. The applicant provided a summary of the recreational activities that take place in the Coos Bay Estuary, and indicated that all three boat ramps that provide access to the estuary will remain open during the proposed dredging activities, as well as an announcement to the boating community via a local notice to mariners provided through notification to the United States Coast Guard. The report in its entirety can be found in this staff report as Attachment A, Exhibit 5 (Page 10).

In their submitted comments the OSCC calls out the importance of the Estuary where the NRI is proposed as being of critical importance to the recreational needs of the citizens and visitors to Coos Bay. The OSCC contends recreational boating and other outdoor activities would likely suffer significant impacts as a result of the construction and ongoing operations.

The applicant has addressed, in its DEA report, their method to minimize impacts on recreational uses in the Estuary. In their final written arguments, the applicant also submitted Exhibit HH which cites multiple documents and studies in the record where JCEP has considered and addressed potential recreational impacts. The applicant asserts and has provided evidence in the form of a technical memo Exhibit EE and FF, potential impacts and proposed mitigation with regards to crustaceans and shellfish. While studies within the Channel are limited, the March 2019 DEIS found the four NRI improvement sites are not located in known clamming or crabbing areas, or shrimp or oyster habitat.

The applicant also addressed Dr. Yamada's study *"Potential Impact of Jordan Cove LNG Terminal Construction on the Nursery Habitat of Dungeness Crab,"* noting that the NRIs are not eelgrass habitat and so dredging these areas would not cause the impacts asserted by Dr. Yamada. (See the study noted in the table of comments received at http://coosbay.org/departments/community-development-department under "Notable Projects" Jordan Cove.) The Chang and Levings (1978) paper as evidenced that dredging causes mortality in Dungeness crab is not relevant to the proposal as the paper cited by Dr. Yamada examines potential effects of burial from open water dredge disposal; JCEP plans to dispose of dredged materials from the NRIs upland at the APCO sites.

Staff Response: The applicant has adequately addressed Goal 8.

Goal 9: Economic Development – To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare and prosperity of Oregon's citizens.

Discussion: The applicant is proposing NRIs to one site within the City's jurisdiction that in turn will facilitate a broader operational window, and increase safety and efficient of water transit, in the Channel. The navigational reliability improvements at NRI #4 have the ability to contribute to economic prospects to the City and region as a whole.

A number of submitted comments, contend that the proposed NRIs will enable transiting LNG tankers to operate in windier conditions, but the applicant fails to demonstrate that dredging associated with the NRI site will improve navigation conditions for commercial vessels other than those JCEP is proposing to operate. Additionally, the OSCC states there is no evidence that the current Channel is limiting the economic opportunities for the City as a whole, rather than for the applicant's own self-interest, and that the applicant will only realize the entire economic benefits if all four proposed NRIs are approved; one NRI location will not result in the economic benefits or increased navigation the applicant is claiming.

Staff Response: The applicant has submitted several economic impact studies completed by ECONorthwest (See Exhibit G.2). The applicant in their request for a Goal 16 exception using economic development as a key approval criterion which will be addressed later in this staff report under criteria required for a goal 16 exception. To see the link between Goal 9 and the Goal 16 exception please refer to Pages 32-34 of this staff report.

Goal 10: Housing – To provide for the housing needs of the citizens of the state.

Staff Response: Goal 10 is not applicable to this application.

Goal 11: Public Facilities and Services –

Staff Response: The applicant's proposal does not involve or affect public facilities and service as framework for development. Goal 11 is not applicable to this application.

Goal 12: Transportation – To provide and encourage a safe, convenient and economic transportation system.

Discussion: The applicant contends the proposal is consistent with Goal 12 because local governments are required to consider all modes of transportation, including water, that facilitate the flow of goods and services so as to strengthen the local and regional economy, and that avoid principle reliance on one mode of transportation. The proposal advances these objectives of Goal 12 by supporting a safer and more efficient use of the Channel for water transportation.

As pointed out earlier in this staff report, public testimony calls out the applicant's failure to adequately provide evidence that the proposal will benefit the local and regional economy. While the applicant affirms that the NRIs help the flow of goods and services by reducing transit time of goods to the market, the decrease of time vessels waiting off-shore for Port conditions to improve, the reduction of fuel, and overall safety and efficiency, opposing testimony refutes this claim and advances the argument that based on the current record, the proposal does not include sufficient evidence that the proposed NRI itself will increase efficiency and reduce delays for vessels other than LNG tankers nor offer evidence as to how much energy is currently wasted when vessels wait outside the Channel.

Staff Response: Staff believe the current record contains adequate evidence to support the applicant's argument advances the Goal 12 objective of facilitating the flow of goods and services in an effort to strengthen the local and regional economy. The applicant in their request for a Goal 16 exception uses transportation as a key approval criterion which will be addressed later in this

staff report under criteria required for a Goal 16 exception. To see the link between Goal 12 and the Goal 16 exception please refer to Pages 32-34 of this staff report.

Goal 13: Energy Conservation – To conserve energy.

Discussion: The applicant's proposed NRI #4 intends to increase the safety and efficiency of vessel transit through the Channel, and thus increase the operational window. The increase of the operational window reduces the time vessels spend waiting to enter the Channel which increases the efficiency of material transportation and reduction of energy waste from inefficiency of transportation.

As indicated earlier, the OSCC contends the applicant fails to demonstrate compliance with Goal 13 because the applicant has not provided evidence sufficient to claim the proposed NRI will *"facilitate maximal energy conservation by increasing the safety and efficiency of vessel transit of the Channel, and by increasing the Channel's operational window."*

The applicant has submitted a memo from a Project Engineer (see Exhibit MM) setting forth the approximate amounts of energy, and reduction in transiting time the proposed NRIs will save. Without the NRIs in place average total delay hours per port call is 23 hours, with the NRIs in place that's reduced to 16 hours, resulting in a seven-hour reduction in transiting time. The average energy savings per LNG carrier port call is 50,750 kW-Hours. At an average of 115 LNG port calls per year this equates to an average energy consumption savings of 5,836 megawatt-hours (mWh) per year; this is equivalent to enough energy to supply power to 6,484 US homes for a month. Staff points out in this memo the energy savings calculations only apply to LNG carriers and are assuming all four NRI sites are approved and in place.

Staff Response: Goal 13 is essentially a planning goal and includes few, if any, substantive requirements that could preclude the proposed PAPAs. The opponents contend the applicant has not provided evidence sufficient to claim the proposed NRI will *"facilitate maximal energy conservation by increasing the safety and efficiency of vessel transit of the Channel, and by increasing the Channel's operational window."* Staff finds Goal 13 simply does not require that. Furthermore, staff finds Exhibit MM does lay out, in a rather detailed fashion, the amount of energy that can be conserved as a result of proposal. The application is consistent with this goal.

Goal 14: Urbanization – To provide for an orderly and efficient transition from rural to urban land use.

Staff Response: Goal 14 is not applicable to this application.

Goal 15: Willamette River Greenway

Staff Response: Goal 15 is not applicable to this application.

Goal 16: Estuarine Resources - To recognize and protect the unique environmental, economic, and social values of each estuary and associated wetlands; and to protect, maintain, where appropriate develop, and where appropriate restore the long-term environmental, economic, and social values, diversity and benefits of Oregon's estuaries.

Staff Response: The Coos Bay Estuary Management Plan (CBEMP) is a refinement plan to the CBCP and implements Goal 16 for the City of Coos Bay. The CBEMP divides all estuaries into three aquatic management units: Natural, Conservation, and Development. The proposed NRI site is currently zoned 52-NA, which is a natural aquatic unit. In the 52-NA natural aquatic zone, dredging is not a permitted use. The applicant seeks to amend the CBEMP to apply the DDNC-

DA (a development aquatic unit) designation to the proposed NRI site in order to allow the dredging necessary to complete the NRIs. A Goal 16 exception is required to rezone the NRI site to a DDNC-DA development site. Staff received numerous public comments urging the City to uphold the integrity of Goal 16. The OSCC submitted comments reasoning that the applicant has failed to satisfy the applicable criteria required for a goal exception. A further discussion of the applicable criteria with respect to a Goal 16 exception will be addressed further in this report.

Goal 17: Coastal Shorelands - To conserve, protect, where appropriate, develop and where appropriate restore the resources and benefits of all coastal shorelands, recognizing their value for protection and maintenance of water quality, fish and wildlife habitat, water-dependent uses, economic resources and recreation and aesthetics. The management of these shoreland areas shall be compatible with the characteristics of the adjacent coastal waters; and to reduce the hazard to human life and property, and the adverse effects upon water quality and fish and wildlife habitat, resulting from the use and enjoyment of Oregon's coastal shorelands.

Staff Response: The proposed NRI #4 site does not include any designated coastal shorelands. The proposed dredge transport pipeline will not impact shorelands within the jurisdictional limits City of Coos Bay. Goal 17 is not applicable to this application.

Goal 18: Beaches and Dunes –

Staff Response: The proposed NRI site does not include any designated beaches or dunes. Goal 18 is not applicable to this application.

Goal 19: Ocean Resources -

Staff Response: The proposed NRI site does not include or abut any ocean resources.

Specific Proposed Amendments to the CBEMP
The following are the exact text amendments the applicant is proposing to the CBEMP. (red)

***

CITY OF COOS BAY TEXT AMENDMENTS ASSOCIATED WITH JORDAN COVE ENERGY PROJECT L.P. APPLICATIONS FOR NAVIGATION RELIABILITY IMPROVEMENTS

(1) AMENDMENT TO COOS BAY ESTUARY MANAGEMENT PLAN

"**5. DESIGNATION OF SITE-SPECIFIC MANAGEMENT SEGMENTS, USES AND ACTIVITIES**

"AUTHORIZED NAVIGATION CHANNELS

"LOWER BAY/UPPER BAY AQUATIC UNIT

"DEEP-DRAFT NAVIGATION CHANNEL (35' authorized draft)
MANAGEMENT CLASSIFICATION – DA

"PROJECT DESCRIPTION :
"The entrance and lower bay section include a federally-authorized project extending from the Entrance Bar at the outer (western) extremity of the jetties to the railroad bridge at Bay Mile 9.0 north of Pony Slough. The project specifies a 45-foot deep channel with 'suitable' width across the Entrance Bar, a 35-foot deep by 300-foot wide channel to the railroad bridge, an Anchorage Basin at Bay Mile 3.5 (southwest of Sitka Dock), a Buoy Storage Area between Sitka Dock and

Pigeon Point (not part of federal project), a Turning Basin north of Empire at Bay mile 6.0, a widened turn area from Lower Jarvis Range to Jarvis Turn Range channels southwest of Bay mile 7.0 to a 41-foot deep MLLW elevation (including 37-foot deep channel, two-foot over-dredge allowance, and two-foot advanced maintenance allowance) (see EXCEPTION #__), and the Anchorage Basin southwest of Roseburg Lumber Co. at Bay mile 7.5. In-bay disposal sites are located off of Coos Head ('G') and North Bend Airport ('D'). Two other in-bay disposal sites at Bay Miles 4 and 5 are included in this segment.
"The upper bay section includes a federally-authorized project from the railroad bridge (Mile 9.0) to Isthmus Slough at Bunker Hill (Mile 15.0). The federal project involves a navigation channel 35 feet deep by 300 to 400 feet wide, and Turning Basins at North Bend (Mile 12.0) and Coalbank Slough (Mile 14.5).
***

As a result of the applicant's request a small amendment will be required in the CBCP that references the approved site-specific exception:

(2) AMENDMENT TO COOS BAY COMPREHENSIVE PLAN 2000, VOLUME III, PART 3, TO ADD EXCEPTION #__ - AQUATIC UNIT 52-NA/DEVELOPMENT UNIT DDNC-DA - NAVIGATION RELIABILITY IMPROVEMENTS

Chapter 3.2, Site-Specific Exceptions, is hereby amended by adding Exception #__ as follows:

[INSERT FINDINGS UPON ADOPTION]

VI. CRITERIA FOR GOAL 16 REASONS EXCEPTION

OAR 660-004-0020

(1) If a jurisdiction determines there are reasons consistent with OAR 660- 004-0022 to use resource lands for uses not allowed by the applicable Goal or to allow public facilities or services not allowed by the applicable Goal, the justification shall be set forth in the comprehensive plan as an exception. As provided in OAR 660-004-0000(1), rules in other divisions may also apply.

Staff Response: In their application the applicant requests an exception to Goal 16 for the proposed NRI dredge site #4. The applicant must meet four standards of Goal 2 (Part II(c), outlined below (2) (a) –(d). A discussion of the reasons justifying a Goal 16 exception for the proposed dredging activity (consistent with OAR 660-004-0022) follows. The applicant has advanced a finding that calls out the *"extremely restrictive, unavoidable turn"* associated with proposed NRI site as the "*special features or qualities that necessitate its location on or near the proposed exception site."* The applicant has submitted testimony in the form of "letters of support" that are in favor of the proposed use for the issues indicated in this staff report.

(2) The four standards in Goal 2 Part II(c) required to be addressed when taking an exception to a goal are described in subsections (a) through (d) of this section, including general requirements applicable to each of the factors:

(a) "Reasons justify why the state policy embodied in the applicable goals should not apply." The exception shall set forth the facts and assumptions used as the basis for determining that a state policy embodied in a goal should not apply to specific properties or situations, including the amount of land for the use being planned and why the use requires a location on resource land;

Staff Response: The applicant has advanced specific "reasons" that "*justify why the state policy embodied in the applicable goals should not apply."*

The applicant asserts that the proposed 3.3-acre NRI site located in the Channel is in need of improvement in order to facilitate safer and more efficient navigation. The applicant indicates that the proposed use must be located where mapped because this is where the navigational reliability improvements are most needed.

Opponent comments point out an exception should be "exceptional", and the applicant's proposal warrants careful consideration to assess its consistency with this "exceptional" standard.

Staff discussion of exception reasons is included in detail on Page 32 of this report, in the response to OAR 660-004-0022.

(b) "Areas that do not require a new exception cannot reasonably accommodate the use." The exception must meet the following requirements:

Discussion: The applicant identifies the proposed NRI #4 site as location specific. The proposed location of the NRI site is the only site JCEP can make the proposed necessary improvements to increase safety and efficient of vessel navigation in the Channel. The applicant asserts that the identified site is at a location in the Channel where there is an extremely restrictive, unavoidable turn in the Channel. This turn is responsible for significant delays in vessel transit in the Channel. The applicant states, in their narrative, that JCEP could widen other areas of the Channel to improve navigational efficiency, but the proposed navigational reliability improvement site, is the location most in need of improvement to achieve the results in improved efficiency and safety of navigation required within the Channel.

A number of public comments received assert the applicant has not identified a need for the proposed NRI because the Channel currently functions for navigation. They affirm that the existing Channel can accommodate the use and that the proposal is not consistent with the requirements of subsection (2)(b).

Staff Response: Staff accept that there exist no true alternative areas to be considered for NRI #4. Alternative locations that address the full LNG terminal are not the subject of this application. To staff's knowledge, no comment has been submitted indicating a more or similar suitable area exists to be dredged that can provide the same improvements the applicant is seeking with NRI #4. Staff finds that addressing the purpose of the NRIs is compellingly site dependent.

(A) The exception shall indicate on a map or otherwise describe the location of possible alternative areas considered for the use that do not require a new exception. The area for which the exception is taken shall be identified;

Staff Response: As explained above, the proposed NRI #4 area is location specific and the applicant indicates it would not be possible to locate them anywhere that does not require a new exception. Comments received with respect to a lack of alternative analysis referred to alternate sites along the western coast of the United States (and Alaska) that could accommodate the full LNG project. To staff's knowledge no commenter offered an alternative site to what the applicant has proposed for NRI #4. A map of the proposed NRI is included as "Dredge Area 4" in Attachment A, Exhibit 1, Page 1 of 4.

(B) To show why the particular site is justified, it is necessary to discuss why other areas that do not require a new exception cannot reasonably accommodate the proposed use. Economic factors may be considered along with other relevant factors in determining that

the use cannot reasonably be accommodated in other areas. Under this test the following questions shall be addressed:

(i) Can the proposed use be reasonably accommodated on resource land that would require an exception, including the destiny of uses on non-resource land? If not, why not?

(ii) Can the proposed use be reasonably accommodated on resource land that is already irrevocably committed to non-resource uses not allowed by the applicable goal, including resource land in existing unincorporated communities, or by increasing the density of uses on committed lands? If not, why not?

(iii) Can the proposed use be reasonably accommodated inside an urban growth boundary? If not, why not?

(iv) Can the proposed use be reasonably accommodated without the provisions of a proposed public facility or service? If not, why not?

Staff Response: The applicant affirms that these are the specific geographic locations where the channel is constrained. The applicant notes that in any case, it is not possible for JCEP to locate them anywhere that does not require a new exception. The proposed use does not relate to a public facility in the Channel, and will not require any additional public facilities or services to construct. This criterion is met.

(C) The "alternative areas" standard in paragraph B may be met by a broad review of similar types of areas rather than a review of specific alternative sites. Initially, a local government adopting an exception need assess only whether those similar types of areas in the vicinity could not reasonably accommodate the proposed use. Site specific comparisons are not required of a local government taking an exception unless another party to the local proceeding describes specific sites that can more reasonably accommodate the proposed use. A detailed evaluation of specific alternative sites is thus not required unless such sites are specifically described, with facts to support the assertion that the sites are more reasonable, by another party during the local exceptions proceeding.

Staff Response: Staff conclude that the proposed NRI area is location specific and, as such; it is not possible for JCEP to locate them anywhere that does not require a similar new exception.

(c) "The long-term environmental, economic, social and energy consequences resulting from the use at the proposed site with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located in areas requiring a goal exception other than the proposed site." The exception shall describe: the characteristics of each alternative area considered by the jurisdiction in which an exception might be taken, the typical advantages and disadvantages of using the area for a use not allowed by the Goal, and the typical positive and negative consequences resulting from the use at the proposed site with measures designed to reduce adverse impacts. A detailed evaluation of specific alternative sites is not required unless such sites are specifically described with facts to support the assertion that the sites have significantly fewer adverse impacts during the local exceptions proceeding. The exception shall include the reasons why the consequences of the use at the chosen site are not significantly more adverse than would typically result from the same proposal being located in areas requiring a goal exception other than the proposed site. Such reasons shall include but are not limited to a description of: the facts used to determine which resource land is least productive, the ability to sustain resource uses near the

proposed use, and the long-term economic impact on the general area caused by irreversible removal of the land from the resource base. Other possible impacts to be addressed include the effects of the proposed use on the water table, on the costs of improving roads and on the costs to special service districts;

Staff Discussion: Public comments noted that, absent more detailed information regarding the proposed methods of dredging, blasting, or other removal within the proposed NRI, a complete analysis of the comparative adverse impacts cannot be done. In response, the applicant submitted additional information describing proposed methods of dredging in which they plan to utilize a hydraulic cutter suction that loosens material from its in-situ state and lifted through a pipe system connected to a centrifugal pump. The sediment-water slurry is pumped from the Channel bottom through a transport pipeline to a barge or upland disposal site. A proposed alternative method is mechanical dredging which excavates in-situ sediments with a grab or bucket from land or water-based structures such as a barge. The most common type of mechanical dredge is the clamshell dredge (See the Dredging Pollution Control Plan, Exhibit BB, Pages, 9-11).

While, staff is not aware of any plans that involve blasting as they relate to NRI #4, the applicant did address comments regarding blasting in their second open record period submittal as seen in Exhibit PP (Page 46) in which the applicant explains: *"ODFW states that the applicant should only submit in-water blasting permit applications after obtaining access to site locations and collecting site-specific information to complete applications. No in-water blasting will occur within the coastal zone."*

Staff Response: There is no compelling evidence of non-compliance with this criterion. There is no indication that the long-term economic, environmental, social and energy costs of widening other areas of the Channel are materially different from the same consequences of making the improvements at the proposed location of NRI #4.

(d) "The proposed uses are compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts." The exception shall describe how the proposed use will be rendered compatible with adjacent land uses. The exception shall demonstrate that the proposed use is situated in such a manner as to be compatible with surrounding natural resources and resource management or production practices. "Compatible" is not intended as an absolute term meaning no interference or adverse impacts of any type with adjacent uses.

Discussion: The proposed NRI site is located immediately adjacent to the existing Channel. The adjacent uses to the Channel are transit of large vessels that currently call on the Port. The adjacent land use designation is Deep Draft –Development Aquatic (DA) unit. According to the CBEMP, DA units "*include areas suitable for deep or shallow-draft navigation (including shipping and access channels or turning basins), sites and mining or mineral extraction areas, and areas adjacent to developed or developable shorelines which may need to be altered to provide navigational access or create new land areas for water-dependent uses."* Additionally, the applicant's consultant (DEA) has submitted an environmental impacts report (Attachment A, exhibit 5) which outlines plans to reduce adverse environmental impacts upon the waters of the Bay and Channel. This includes performing capital and maintenance dredging during the ODFW-approved in-water work window (October 1 to February 15) to reduce impacts to sensitive life stages of fish in the bay, using various dredging methods to minimize the effects on water turbidity within the bay, and applying best management practices associated with dredging (including cutter head suction, clamshell, and hopper dredging) to reduce turbidity effects. As a result of those methods JCEP expects any increased water turbidity resulting from the NRI to be temporary and limited to the immediate vicinity of dredging operations.

This assertion by the applicant in some part was disputed by ODEQ in their finding that dredging at the NRIs would cause turbidity levels to increase above allowable numeric limits (See Attachment B, 6.9.3 DEQ Findings: Turbidity, and 1.4 WQC Decision).

Numerous public comments challenge the applicant limiting their consideration of adjacent uses to the channel alone, noting that adjacent to the NRI #4 site are shellfish beds and crabbing areas. Opponents have submitted expert testimony related to the impacts of dredging with respect to sedimentation and turbidity, see Exhibit 29.

In their final written argument's dated May 23, 2019, the applicant identifies navigation, transportation and dredging as the compatible uses.

Staff Response: Staff note the following excerpt from the criteria: *"The proposed uses are compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts".* The opponents argue that the applicant fails to specifically address adjacent uses to the Channel. If authorized, the proposal would be occurring adjacent to the existing NA-52 designation. If the term "uses" is strictly applied as listed in the CBEMP, under NA-52 no marine organisms are listed as "uses". Opponent comments note that adjacent to NRI #4 are shellfish beds and crabbing areas. The applicant, in their evidence, characterized only the Channel in-general as an adjacent use. Opposition notes that the sensitive NA-52 zone is an adjacent use.

The exception shall demonstrate that the proposed use (in this case dredging) is situated in such a manner as to be compatible. "Compatible" is not intended as an absolute term meaning no interference or adverse impacts of any type with adjacent uses. JCEP does state increased water turbidity will be a result of the dredging at NRI #4, but the adverse impacts as a result of the dredging are expected to be temporary and limited to the immediate vicinity of dredging operations. ODEQ denied a 401-water quality permit because, in part, their measures designed to reduce adverse impacts were not sufficient; specifically measures, or best practices employed to keep water turbidity levels reaching in excess of numeric limits. As staff noted earlier, the local decision-making body must determine whether the ODEQ permit denial somehow implicates an applicable approval criterion, if the local decision-making body cannot connect ODEQ's decision to deny a 401-water quality permit to applicable criteria, staff agree, in part, with the applicant that the denial should not be used as grounds for denial of this application (the applicant has argued three reasons why the City should not consider ODEQ's decision; Staff have offered an analysis of each of those arguments on Pages 18-19 of this staff report). The mere submittal of the Dredging Pollution Control Plan without an actual described link by the applicant or their consultant in their written arguments as to how it mitigates adverse impacts with respect to turbidity is unclear, but as noted earlier, the applicant's experts on the subject matter says the Dredge Pollution Control Plan is sufficient, and to staff's knowledge no opponent testimony have been submitted to refute any of the findings and/or analysis contained in the Dredge Pollution Control Plan. Staff have imposed a condition of approval describing that the applicant shall obtain the Section 401 Water Quality Certification in which the Dredge Pollution Control Plan will have to be a part of in order for ODEQ to issue a decision.

(3) If the exception involves more than one area for which the reasons and circumstances are the same, the areas may be considered as a group. Each of the areas shall be identified on a map, or their location otherwise described, and keyed to the appropriate findings.

Staff Response: The applicant's proposal seeks an exception to Goal 16 for one NRI site within the City's jurisdiction. The remaining three sites fall outside of City jurisdiction. As Staff have pointed out in this staff report, the City by law, shall only consider the NRI contained within the

City of Coos Bay's jurisdiction. To see a map of the proposed navigational reliability areas, see Attachment A, exhibit 1, Page 1 of 4, included in this staff report. This criterion does not apply.

ANALYSIS OF OAR 660-004-0022
OAR 660-004-0022 addresses, in greater detail, the *"types of reasons that may or may not be used to justify certain types of uses not allowed on resource lands."* Consistency with any one of the ten alternatives outlined in OAR 660-004-0022 provides sufficient justification for a "reasons" exception.

In seeking an approval of a Goal 16 exception as requested in this application, the applicant's representative advances two avenues in which a Goal 16 exception may be approved. The applicant asserts that the application meets the criteria for a goal exception under the general exceptions as indicated in OAR 660-004-0020(1); The applicant affirms that the application also meets the criteria for a goal exception through a second avenue under OAR 660-004-0022(8)(b).

Following is the staff response for both of these criteria.

OAR 660-004-0022
Reasons Necessary to Justify an Exception Under Goal 2, Part II(c)
An exception under Goal 2, Part II(c) may be taken for any use not allowed by the applicable goal(s) or for a use authorized by a statewide planning goal that cannot comply with the approval standards for that type of use. The types of reasons that may or may not be used to justify certain types of uses not allowed on resource lands are set forth in the following sections of this rule. Reasons that may allow an exception to Goal 11 to provide sewer service to rural lands are described in OAR 660-011-0060. Reasons that may allow transportation facilities and improvements that do not meet the requirements of OAR 660-012-0065 are provided in OAR 660-012-0070. Reasons that rural lands are irrevocably committed to urban levels of development are provided in OAR 660-014-0030. Reasons that may justify the establishment of new urban development on undeveloped rural land are provided in OAR 660-014-0040.

(1) For uses not specifically provided for in this division, or in OAR 660-011-0060, 660-012-0070, 660-014-0030 or 660-014-0040, the reasons shall justify why the state policy embodied in the applicable goals should not apply. Such reasons include but are not limited to the following:

(a) There is a demonstrated need for the proposed use or activity, based on one or more of the requirements of Goals 3 to 19; and either

(A) A resource upon which the proposed use or activity is dependent can be reasonably obtained only at the proposed exception site and the use or activity requires a location near the resource. An exception based on this paragraph must include an analysis of the market area to be served by the proposed use or activity. That analysis must demonstrate that the proposed exception site is the only one within that market area at which the resource depended upon can reasonably be obtained; or

(B) The proposed use or activity has special features or qualities that necessitate its location on or near the proposed exception site.

Discussion: Under OAR 660-004-0022(1) the applicant must demonstrate a need for the proposed use/activity based on requirements of one or more State Planning Goals 3 to 19. In the applicant's case, the demonstrated need for the proposed NRI site is based primarily on Goal 9 (Economic Development) and 12 (Transportation). As explained in the applicant's narrative,

structural restrictions on the Channel cause significant transit delays and unduly increase directional changes during transit through the Channel. Delays are measured in the total transit time; from the time the vessel arrives off the coast of Coos Bay until it returns offshore. Minimizing delay is a pressing need because companies that utilize the Port have identified new customers in Asia that desire to export cargo using bulk carriers that are slightly larger than the ships typically calling on the Port today. The applicant points out there are various marine terminal businesses within Coos Bay that require assurances that terminals can efficiently accommodate larger dimension bulk carriers in the future. Comments submitted call out that the proposal is only benefiting JCEP and not all users of the Port. The proposed NRIs will allow companies to secure emerging opportunities to export products using today's larger vessels, including bulk carriers of up to 299.9 meters (983.3 feet) in length, 49 meters (160.8 feet) in beam, and 11.9 meters (39 feet) in draft. The applicant has included in its application a letter from the US Coast Guard to JCEP, indicating Coos Bay Pilots can safely and successfully maneuver carriers of up to 299.9 X 49m X 11.9 dimensionally while transiting the Channel. The letter is included in this staff report as Attachment A, Exhibit 4 (Page 15).

In their narrative, the applicant asserts that JCEP and the Coos Bay Pilots believe the proposed navigational reliability improvement site is essential to achieve the required number of LNG vessel transits needed to lift the JCEP design annual LNG production volume. Excessive delays in LNG carrier transit in the Channel, to and from the LNG terminal, could result in a shore storage tank topping situation, requiring JCEP to curtail LNG production.

Comments submitted question whether allowing larger vessels to transit in and out of the Bay actually creates a safer environment. Public testimony suggests the applicant has failed to demonstrate that enabling LNG vessels to transit under windier conditions would actually result in safer navigation in the Lower Bay.

Staff have received several public comments asserting that the applicant has failed to compelling show that the proposal will be an "economic boon" and that a general desire to "boost the local economy" or general statements about reducing traffic delays are not sufficient to establish a "demonstrated need" sufficient to warrant a "reasons" exception to Goal 16. Additionally, the OSCC affirms in their submission comments that it is unclear from the evidence provided by the applicant that the proposed NRI will reduce delays for the average vessel currently navigating the Channel. Further, the OSCC points the applicant has submitted no evidence that suggests the conclusion that continuing existing shipping and commercial activities in the Bay would be unduly constrained absent the proposed NRI. For these reasons, the OSCC contends that the applicant has failed to show that the NRI will fulfill a *"demonstrated need for enhanced shipping within the Bay"* and that there is insufficient evidence in the record to assess compliance with the policy objectives of Goals 9 and 12 as is. As a result, the OSCC argues that the proposal fails to meet the criteria to justify a Goal 16 exception.

At the close of the first open record period, the applicant did submit a memo, included in this staff report as and a memo completed by ECONorthwest outlining the economic benefits (Exhibit G.2).

In the applicant's final written arguments dated May 23, 2019 the applicant adds a third goal (Goal 13 Energy Conservation) for which the proposal shows a "demonstrated need" for. This third goal (Goal 13) had not been previously explicitly called out in the applicant's initial application, or first or second open record period submittals as evidence to support a Goal 16 exception based on OAR 660-004-0022(1). The memo addressing energy consumption (Exhibit MM) was submitted prior to the close of the first open record period on April 25, 2019 when new evidence is permitted into the record.

Staff Response:
There is case law which brings into question the ability of the applicant to apply this provision in justifying an exception to Goal 16. The applicant has identified and provided a response to the reason's exception alternative OAR 660-004-0022(8)(b) (below). Staff concur that this proposal specifically aligns with that specific listed use. It is not perfectly clear whether, according to OAR 660-004-0022(1), another subsection (such as 1) can be used to justify a reasons exception, as it implies that Section 1 is intended *"For uses not specifically provided for in this division."* Analysis of this issue requires more evidence than the record can currently support.

Following is an analysis of the opponent's argument specific to Goals 9 and 12.

The demonstrated need must be based on requirements of one or more of the statewide planning goals; i.e., the exception is required in order to meet the City's obligation under one or more of the goals. Market demand or findings that the use would contribute to the local economy are not sufficient. For instance, in *Drouhin v. Perse (2002)*, LUBA found: in order to demonstrate a need to locate a hotel on farmland based on the general Goal 9 requirement to "provide adequate opportunities for a variety of economic opportunities," the county was required to establish that it failed or is at risk to provide adequate opportunities for a variety of economic activities, and that taking an exception to Goal 3 to provide for a hotel is a necessary step toward satisfying that goal requirement. In the case of the application and current record, the City Council would need to find that the proposed exception is required in order for the City to meet its Goal 9 and Goal 12 obligation. Staff's review of the record does not contain evidence sufficient that would indicate an exception to Goal 16 is necessary for the City to meets its Goal 9 and Goal 12 obligations.

The City Council would need to find evidence indicating the City is currently not meeting its Goal 9 obligation and approving a Goal 16 exception to authorize NRIs would be a necessary step in doing so in order to find this criterion met.

With respect to Goal 12, The City Council would need to evidence indicating the City is currently not meeting its Goal 12 obligation and approving a Goal 16 exception to authorize the NRIs would be a necessary step in doing so in order to find this criterion met.

(8) Goal 16 – Other Alterations or Uses: An exception to the requirement limiting dredge and fill or other reductions or degradations of natural values to water-dependent uses or to the natural and conservation management unit requirements limiting alterations and uses is justified, where consistent with ORS chapter 196, in any of the circumstances specified in subsections (a) through (e) of this section:

Discussion: The applicant also provided a response to the reason's exception alternative OAR 660-004-0022(8)(b). This is a specific exception to the requirement limiting dredging in an area that is currently designated, in accordance with Goal 16, as a natural management unit. The applicant asserts that the exception is justified because approval of the application will authorize dredging to maintain adequate depth to safely and more reliably permit continuation of the present level of navigation.

(b) Dredging to maintain adequate depth to permit continuation of the present level of navigation in the area to be dredged.

Discussion: The applicant affirms that the proposed improvements are designed to increase the environmental operating window for all vessels entering the Bay by softening critical turns, relocating navigational aids to navigation, and reducing the required Channel directional changes. The applicant claims that, the proposed dredging will reduce entry and departure delays and allow

for more efficient vessel transits through the Channel for the size of vessels calling on the Port today.

The applicant notes that, for JCEP, the proposed navigational reliability improvements will allow for transit of Liquid Natural Gas (LNG) vessels of similar overall dimensions to those listed in the July 1, 2008 US Coast Guard (USCG) Waterway Suitability Report, the USCG Letter of Recommendation dated May 10, 2018 and USCG letter confirmation dated November 7, 2018, but under a broader range of weather conditions, specifically higher wind speeds. As a result, JCEP estimates that upon completion of the proposed navigational reliability improvement site, JCEP will be able to export the full capacity of the optimized design production of the LNG terminal on a consistent basis. For these reasons, the applicant advances a proposal that the dredging associated with the navigational reliability improvement will maintain adequate depth to permit continuation of the presently allowed level of navigation, and allow that navigation to occur more efficiently, safely and reliably. The aforementioned letters are included in this staff report as Attachment A, Exhibit 4.

In their submission comments, the OSCC note that the reason to permit dredging "to maintain adequate depth to permit ***continuation*** of the ***present*** level of navigation" is a provision that is only applicable to maintenance dredging, not to an expansion of a channel into new areas presently designated for natural aquatic management.

Additionally, the OSCC asserts the applicant has provided no evidence that the current Channel is inoperable without dredging in the adjacent natural management areas or that the proposed NRI is required for continued use of the existing Channel. The OSCC refutes the applicant's claim that the proposed NRI will allow for navigation to occur more efficiently, safely and reliably. The OSCC advances an alternate conclusion that it's not clear that dredging to widen the turns would increase safety margins for pilots: while the turns are wider, they will be taken at higher wind speeds.

Staff Response: Staff believes, based on the applicant's statement, and materials provided in the record, that the NRI proposed supports more than the "continuation of the present level of navigation." It proposes "enhancements" of the Channel, enabling larger ships at greater frequencies than at present levels. Staff note that OAR 660-004-0022(8)(b) appears to be DLCD's attempt to balance the interests of protecting coastal resources and economic and navigation interests, and the rule was likely intended to preserve only the navigation rights that are in existence when the Exception application was filed. (i.e. The spirit of the provision is enabling dredging and maintenance to keep in check natural processes (including sedimentation) which impede "present levels of navigation" not necessarily to enable the enhanced navigation proposed.

(f) In each of the situations set forth in subsections (8) (a) to (e) of this rule, the exception must demonstrate that the proposed use and alteration (including, where applicable, disposal of dredged materials) will be carried out in a manner that minimizes adverse impacts upon the affected aquatic and shoreland areas and habitats.

Discussion: The applicant indicates in their application that they will complete the proposed NRIs at the site in a manner that minimizes adverse impacts upon the affected aquatic and shoreland areas and habitats.

Numerous submissions of public testimony contest that more information regarding potential adverse impacts arising from the proposed NRI is needed, as well as a description of the methods to be used before any conclusion can be made regarding the criteria contained in subsection (f).

In their submission comments, the OSCC specifically points out that the DEA memo (Attachment A, exhibit 5) makes reference to “best management practices”, but the applicant fails to specifically identify what those are. Also lacking in the DEA memo is an assessment of the potential risk of oil spills and any other toxic discharge related to dredging and accessory uses. The OSCC finds staffs proposed Condition of Approval #1 insufficient absent evidence that these measures will be adequate to protect aquatic resources.

As noted earlier in this staff report, ODEQ found dredging for the NRIs, the Slip, and Access Channel would cause turbidity levels to increase above allowable numerical limits.

The applicant plans to perform the proposed dredging during the Oregon Department of Fish and Wildlife (ODFW) approved in-water work window (October 1 to February 15) to reduce impacts to sensitive life stages of fish in the Bay.

Additionally, related to dredging practices and methods, the applicant indicates in their application that JCEP will use various dredging methods (described in Attachment A, exhibit 5) to minimize the effects of the NRIs on water turbidity within the Bay. JCEP will use best management practices (including cutter head suction, clamshell, and hopper dredging) associated with dredging to reduce turbidity effects, and as a result of those methods JCEP expects any increased water turbidity as a result of the NRIs to be temporary and limited to the immediate vicinity of dredging operations. The applicant also describes the various dredging practices in its Dredging Pollution Control Plan (see Exhibit BB on City’s website).

The applicant notes that dredging and material transport vessels will carry small volumes of petroleum in comparison to large bulk carriers and Panamax vessels that regularly traverse Coos Bay. JCEP will use best management practices to avoid and minimize spills or discharges during dredging operations and dredged material transport.

Dredging equipment and material transport vessels related to the proposed NRI site may generate temporary noise disturbances; however, evidence suggests that the noise will be localized to the immediate dredging area. The applicant states they do not anticipate that noise levels will have more than temporary effects on the behavior of aquatic species in the area of the proposed NRI site. The applicant’s consultant, DEA has evaluated the proposal and provided additional details on potential adverse impacts associated with the proposed dredging. The report is included in this staff report as Attachment A, Exhibit 5. Additionally, the applicant has submitted a memo (Exhibit II) further detailing possible adverse impacts to aquatic species with respect to operational noise and spills. The applicant’s consultant indicates marine mammals may be potentially impacted by operational noise from the dredging activities and potential oil and lubrication spills. All marine mammals are protected under the Marine Mammal Protection Act (MMPA), which requires authorization from the National Marine Fisheries Service (NMFS) for incidental harassment of marine mammals. In its DEIS FERC opined that *“maintenance dredging would generate underwater sound pressure levels that could elicit responses in aquatic organisms”,* but that generally *“response to changes in noise levels would be behavioral and perceptual, and not physiological In nature, as fish and marine mammals would tend to avoid that area during periods of high noise output.”* The applicant’s consultant concludes that operational noise would not have significant adverse effects on aquatic resources, and sound levels from dredging are not expected to exceed NMFS thresholds established as causing behavioral harassment to marine mammals in the Bay such that they alter their breeding, foraging, migrating or sheltering patterns. JCEP would be required to conduct all activities in accordance with the MMPA, as enforced by NMFS, and in accordance with all other regulatory agency requirements including the use of appropriate sound attenuation measures, as necessary. The report is included in this staff report as Exhibit II. The following Condition of Approval is appropriate related to potential adverse impacts to marine mammals as a result of operational noise associated with the proposed dredging activities.

<u>Condition of Approval #2:</u> JCEP shall receive written authorization to perform the proposed dredging from the National Marine and Fisheries Service in accordance with NMFS agency requirements. Proof of such authorization shall be submitted to the Coos Bay Community Development Administrator prior to the commencement of dredging activities.

<u>Staff Response</u>: The applicant addresses inadvertent spills, or discharges in Attachment A, exhibit 5, (Page 8) indicating that they will take preventative measures such as an implementation of a spill prevention plan. The applicant has completed a draft Spill Prevention, Control and Countermeasure Plan (SPCC Plans) (Exhibit A.4, due to length not included in this staff report – refer to City's website.) that will be finalized prior to facility operation. Staff note that, by in large, the SPCC pertains to the larger project. The Dredging Pollution Control Plan is specific to the NRIs, Kentuck and APCO sites and includes a section on spill response procedures. Staff find the plan reasonable to address spills related to the proposed dredging activities. Staff have not received any comments or expert testimony to refute the validity of its spill response procedures, but staff have received a comment from the Former Director of the South Slough Estuarine Research Reserve related to concerns about accidental sediment releases associated with the possible pump or pipeline failure. Lastly, as previously indicated in this staff report, it's unclear if ODEQ has seen and reviewed the Dredging Pollution Control Plan due to the open and closure of record period(s), but without any comments related to its effectiveness and validity or expert testimony to the contrary, staff find it reasonable to believe the applicant can address spills should they occur. With respect to the Confederated Tribes comment regarding a reduction in the IWWW to end on February 1 rather than February 15, it's staff's position that the City nor staff have the authority to shorten an ODFW approved IWWW. Staff would be looking for guidance in the form of referral comment on this matter from ODFW staff. Staff believe this is a matter than can further be addressed during the City Council process.

VII. EVALUATION OF CRITERIA FOR ESTUARINE AND COASTAL SHORELAND USES ACTIVITIES PERMIT

CBMC – 17.52.010 General

Uses and activities permitted by the Coos Bay Estuary Management Plan are subject to general and special conditions and policies to comply with statewide planning goals and the Coos Bay Estuary Plan as adopted by the city of Coos Bay. Compliance with these conditions and policies must be verified; therefore, all uses and activities under jurisdiction of the Coos Bay Estuary Management Plan must be reviewed.

COOS BAY ESTUARY MANAGEMENT PLAN (CBEMP) POLICIES

Below are CBEMP Policies pertinent to the subject application.

CBEMP Policy #17 - Protection of "Major Marshes" and "Significant Wildlife Habitat" in Coastal Shorelands

Local government shall protect major marshes, significant wildlife habitat, coastal headlands, and exceptional aesthetic resources located within the Coos Bay Coastal Shorelands Boundary and included in the Plan inventory, except where exceptions allow otherwise. Local government shall consider:

A. "major marshes" to include areas identified in the Goal #17 "Linkage Matrix" and the Shoreland Values inventory map;

B. "significant wildlife habitats" coastal headlands and exceptional aesthetic resources to include those areas identified, on the map "Shorelands Values."

This strategy shall be implemented through:

A. Plan designations and use and activity matrices set forth elsewhere in the Plan that limit uses in these special areas to those that are consistent with protection of natural values, and

B. Through use of the "Shoreland Values" map that identifies such special areas and restricts uses and activities therein to uses that are consistent with the protection of natural values. Such uses may include propagation and selective harvesting of forest products consistent with the Oregon Forest Practices Act, grazing, harvesting wild crops, and low-intensity water-dependent recreation.

A. "major marshes" to include areas identified in the Goal #17 "Linkage Matrix" and the Shoreland Values Inventory map;

B. "Significant wildlife habitats," coastal headlands and exceptional aesthetic resources to include those areas identified on the map "Shoreland Values."

This strategy recognizes that special protective consideration must be given to key resources in coastal shorelands over and above the protection afforded such resources elsewhere in this Plan.

Staff Response: According to the Shoreland Values map, there are no inventoried resources at the proposed navigational reliability improvement site for which CBEMP Policy #17 requires protection. Despite this preliminary conclusion, staff propose that CBEMP Policy #17 be included as a general condition of approval for dredging associated with the NRI. It is added a condition of approval under Section VIII.

Condition of Approval #5: ***As a general condition, and in the event that additional analysis or circumstance reveals relevant and previously unknown or unmapped shoreland resources, all dredging activity must remain consistent with CBEMP Policy #17 - Protection of "Major Marshes" and "Significant Wildlife Habitat" in Coastal Shorelands.***

CBEMP Policy #18 - Protection of Historical and Archaeological Sites Within Coastal Shorelands.

Local government shall provide special protection to historic and archaeological sites located within the Coos Bay Coastal Shorelands Boundary, except where Exceptions allow otherwise. These sites are identified in the section entitled: "Coastal Shoreland Values Requiring Mandatory Protection" and on the "Special Considerations Map." Further, local government shall continue to refrain from widespread dissemination of site-specific information about identified archaeological sites.

This strategy shall be implemented by requiring review of all development proposals involving an archaeological or historical site to determine whether the project as proposed would protect the archaeological and historical values of the site.

The development proposal, when submitted, shall include a site development plan showing, at a minimum, all areas proposed for excavation, clearing and construction. Within three (3) working days of receipt of the development proposal, the local government shall notify the Coos, Siuslaw, Lower Umpqua Tribal Council in writing, together with a copy of the site development plan. The Tribal Council shall have the right to submit a written statement to the local government within ten (10) days of receipt of such notification, stating whether the project as proposed would protect the historical and archaeological values of the site, or if not, whether the project could be modified by appropriate measures to protect those values.

"Appropriate measures" may include, but shall not be limited to the following:

A. Retaining the historic structure in situ or moving it intact to another site; or

B. Paving over the site without disturbance of any human remains or cultural objects upon the written consent of the Tribal Council; or

C. Clustering development so as to avoid disturbing the site; or

D. Setting the site aside for non-impacting activities, such as storage; or

E. If permitted pursuant to the substantive and procedural requirements of ORS 97.750, contracting with a qualified archaeologist to excavate the site and remove any cultural objects and human remains, reinterring the human remains at the developer's expense; or

F. Using civil means to ensure adequate protection of the resources, such as acquisition of easements, public dedications, or transfer of title.

If a previously unknown or unrecorded archaeological site is encountered in the development process, the above measures shall still apply. Land development activities which violate the intent of this strategy shall be subject to penalties prescribed in ORS 97.990 (8) and (9). Upon receipt of the statement by the Tribal Council, or upon expiration of the Tribal Council's ten-day response period, the local government shall conduct an administrative review of the development proposal and shall:

A. Approve the development proposal if no adverse impacts have been identified, as long as consistent with other portions of this plan, or

B. Approve the development proposal subject to appropriate measures agreed upon by the landowner and the Tribal Council, as well as any additional measures deemed necessary by the local government to protect the historical and archaeological values of the site. If the property owner and the Tribal Council cannot agree on the appropriate measures, then the governing body shall hold a quasi-judicial hearing to resolve the dispute. The hearing shall be a public hearing at which the governing body shall determine by preponderance of evidence whether the development project may be allowed to proceed, subject to any modifications deemed necessary by the governing body to protect the historical and archaeological values of the site.

This strategy recognizes that protection of historical and archaeological sites is not only a community's social responsibility, but is also legally required by Goal #17 and OBS 97.745. It also recognizes that historical and archaeological sites are non-renewable cultural resources.

Discussion: The applicant notes that the Shoreland Values Map does not indicate any known inventoried resources in this location to consider under this policy. Through correspondence with staff, members of the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indian (Tribes), asserted that the Shoreland Values inventory map is old (2002) and that there may be resources in the vicinity of the NRI Site. During the course of the proposed development there may be unanticipated discovery of cultural resources, remains, and/or objects. The applicant has included, in their submission, a copy of a Memorandum of Agreement (MOA) between JCEP and the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indian (Tribes) addressing these circumstances, and more broadly, Policy 18. A copy of the MOA is included in the record and can be found in the applicant's application. The MOA incorporates a Cultural Resources Protection Agreement (CRPA) entered between JCEP and the Tribes in July of 2018. The CRPA provides a process for the exchange of project-related information, confidentiality requirements, commitments to mitigation, monitoring agreements, agreements for the treatment of unanticipated discovery of cultural resources, site access agreements, and cost recovery agreements. The CRPA includes an Unanticipated Discovery Plan (UDP), which provides procedures in the event of an unanticipated discovery of historic properties, archeological objects, archaeological sites or human remains, funerary objects, sacred items, and items of cultural patrimony, during the construction and operation of the proposed temporary dredge transport pipeline.

Staff Response: Staff proposes the following condition of approval to ensure compliance with respect to Policy #18

Condition of Approval #3: Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall comply with the requirements of the enclosed MOA, CRPA, and UDP as agreed upon and signed by JCEP and the Confederated Tribes of Coos, Lower, Umpqua, and Siuslaw Indians, as well as consistency with any other provisions of Policy #18 of the CBEMP.

CBEMP Policy #5 – Estuarine Fill and Removal

Staff Response: JCEP's new and maintenance dredging activities must be consistent with CBEMP Policy #5. The DDNC-DA zone allows new and maintenance dredging. If the Goal 1 6 exception is granted Policy #5 requires only that the Application comply with criteria D. and E., because, as expressly noted within the Policy, the findings for the Goal 16 exception suffice for this Application to comply with criteria A - C. If the exception is denied then Policy 5 A – C are irrelevant. A Goal 16 exception to Estuarine Resources is required in order to proceed with the proposed rezoning of 3.3 acres of 52-NA to DDNC.

Dredging and/or filling shall be allowed only:

A. If required for navigation or other water-dependent uses that require an estuarine location or if specifically allowed by the applicable management unit requirements of this goal; and

Staff Response: Although staff concur with the applicant's finding that Policy #5 indicates if an application includes the request for a goal exception, findings for the goal exception shall be sufficient for this criterion. As indicated earlier in this staff report, the proposed NRIs are required for navigational purposes within the Channel.

B. If no feasible alternative upland location exists; and

Staff Response: Staff agrees with the applicant's finding that Policy #5 indicates if an application includes the request for a goal exception, findings for the goal exception shall be sufficient for this criterion. As indicated earlier in this staff report, the proposed location of the NRIs is the only site JCEP can make the proposed necessary improvements to increase safety and efficient of vessel navigation in the Channel. To staff's knowledge no comment has been submitted indicating a dredge alternate site(s) for NRI #4 that would achieve the same benefit with respect to navigational reliability the applicant is proposing.

C. If a pubic need (i.e., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights; and

Staff Response: Staff agrees with the applicant's finding that Policy #5 indicates if an application includes the request for a goal exception, findings for the goal exception shall be sufficient for this criterion. As indicated earlier in this staff report, the applicant's proposal serves a public need by creating safer and more efficient navigation in the Channel, thereby promoting economic activity in the City of Coos Bay.

As indicated in Section IV of this staff report, several comments from the public dispute the applicant's claim that the proposal displays a public need (i.e., a substantial public benefit). After reviewing the applicant's rebuttal comments their assertion remains the proposed NRIs will serve a public need by creating safer and more efficient navigation in the Channel for all users – not just JCEP. The applicant has reiterated that the proposed NRIs will benefit commercial operators in Bay, as indicated by statements from the Coos Bay Pilots Association, Roseburg Forest Products, and other users of the Channel; This in turn promotes economic activity within the City of Coos Bay and the entire region. The applicant has submitted several economic studies showing a value added by the larger project. To staff's knowledge the applicant has not submitted any evidence of the economic value added specific by NRI #4. However, staff has found an excerpt from the applicant's response to Fill-Removal Comments, dated May 9, 2019 in which the applicant states the LNG terminal will generate an estimated 110 to 120 new international deep-draft vessel calls to the Port each year. This is nearly a 300% increase over current annual ship traffic. Each vessel call alone to the Port delivers an estimated $1.3 million in direct and indirect economic value, and public benefit to the area and Oregon. The applicant's response to Fill-Removal Comments with respect to public need have been included in this staff report as Exhibit PP (Pages 16-20). Staff conclude these additional deep-draft vessel calls by international vessels would not be practicable or possible without the NRIs in place.

D. If adverse impacts are minimized; and

Staff Response: Comment was received by the Confederated Tribes rejecting the applicant's and ODFW's proposed In Water Work Window (IWWW) of October 1 to February 15. The comment contends that in order for the intent of Policy #5 of the CBEMP with respect to adverse impacts and "reduce impacts to sensitive life stages of fish in the Bay", the IWWW should be modified to end on February 1 (Tribes propose a revised IWWW of October 1 to February). The Tribe's cite evidence from their Natural Resource Department's staff indicating that herring spawning (by a location know as Fossil Point) occurs in February. The Tribe's urge the City and staff to consider a condition of approval that provides the IWWW end by February 1. The Tribe's comment with respect to the IWWW is included in this staff report as Attachment C. To staff's knowledge, the applicant has not addressed the Tribe's specific concern about ending the IWWW by February 1. Staff have sent referral notice to OFDW for comment on the Tribe's proposed amendment to the approved IWWW and await a response as of the writing of this staff report.

Compliance with criterion D directs the applicant to demonstrate how adverse impacts will be minimized, pursuant to CBEMP Policy #4a. Strategies, and best practices proposed by the applicant to minimize adverse impacts are mentioned earlier in this staff report and submitted into the record and can also be found in the DEA Memo included at Attachment A, Exhibit 5. Concerns exist as to how the applicant will minimize adverse impacts with respect to turbidity as raised by ODEQ in their denial of the applicant's Section 401 water quality permit. The Council will have to consider their options as outlined on Pages 17 and 18 with respect as to how address the ODEA Section 401 quality permit.

E. The activity is consistent with the objectives of the Estuarine Resources Goal and with other requirements of state and federal law, specifically the conditions in ORS 541.615

Staff Response: Compliance with criterion E directs the applicant to demonstrate that the proposed NRIs are "*consistent with the objectives of the Estuarine Resource Goal and with other requirements of state and federal law, specifically the conditions in ORS 541.615 and Section 404 of the Federal Water Pollution Control Act (P.L. 92-500)*." The applicant asserts that the NRIs are consistent with the objectives of Goal 16 (Estuarine Resources Goal) because they represent a balance of estuary uses, protecting the economic values of the estuary while minimizing adverse impacts of the dredging activity. The applicant asserts that all necessary DSL and Federal Section 404 authorizations will be obtained as a condition precedent to dredging. As noted earlier in this staff report, ODEQ denied, without prejudice, JCEP's water quality permit, meaning they could re-apply.

For the City to find grounds for denial based on ODEQ's decision, the City must find ODEQ's decision relates to applicable criteria in which the City is basing their decision on. The applicable criteria may be found in this section (Policy #5, E) which reads *"consistent with the objectives of the Estuarine resource Goal and with other requirements of state and federal law, specifically the conditions in ORS 541.615 and Section 404 of the Federal Water Pollution Control Act."* Staff find it reasonable for the Council to find that the applicant has failed to show its proposal is consistent with Policy #5 because the denial of the ODEQ water quality permit does not demonstrate that the proposal is consistent with other requirements of state law, and therefore cannot be consistent with Policy #5, E.

On the contrary, if Council were to look for consistency with Policy #E, it would have to rely on a finding that it's reasonable to assume the proposal can meet the requirements of state and federal law. Staff have outlined options for City Council to consider as noted in the Agenda Item Summary Memo/Matrix.

Staff proposes the following condition of approval to ensure compliance with Policy #5, E:

***Condition of Approval #4:* Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall obtain, and provide evidence of, all necessary ODEQ, DSL and Federal Section 404 authorizations. JCEP shall provide the City with copies of these approved authorizations for the record.**

Policy #5 (continued)

Other uses and activities which could alter the estuary shall only be allowed if the requirements in B, C, and D are met. All portions of these requirements may be applied at the time of plan development for actions identified in the Plan. Otherwise, they shall be applied at the time of permit review.

This strategy shall be implemented by the preparation of findings by local government documenting that such proposed actions are consistent with the Comprehensive Plan, and with criteria "a" through "e" above. However, where goal exceptions are included within this plan, the findings in the exception shall be sufficient to satisfy criteria "a" through "c" above. Identification and minimization of adverse impacts as required in "d" above shall follow the procedure set forth in Policy #4a. The findings shall be developed in response to a "request for comment" by the Division of State Lands, which shall seek local government's determination regarding the appropriateness of a permit to allow the proposed action.

"Significant," as used in "other significant reduction or degradation of natural estuarine values," shall be determined by:

A. The U.S. Army Corps of Engineers through its Section 10 and 404 permit processes; or
B. The Department of Environmental Quality for approvals of new aquatic log storage areas only; or
C. The Department of Fish & Wildlife for new aquaculture proposals only.

This strategy recognizes that Goal #16 limits dredging, fill, and other estuarine degradation in order to protect the integrity of the estuary.

Staff Response: CBEMP Policy #5 requires that other uses and activities which could alter the estuary only be allowed if the requirements in B, C, and D are met. The local government shall issue preparation of findings that such actions proposed by the applicant are consistent with the Comprehensive Plan, and with criteria "A" through "E" above. However, staff agrees with the applicant's finding that, where a goal exception is proposed as part of the request, the findings in the exception shall be sufficient to satisfy criteria "A" through "C" above.

When addressing criteria "D", the applicant shall follow the procedure set forth in Policy #4a. Policy #4a outlines how resource capability consistency and impact mitigation is conveyed and ensured for uses and activities within management units.

CBEMP Policy #4 – Resource Capability Consistency and Impact Assessment

Local government concludes that all proposed actions (approved in this Plan) which would alter or potentially alter the estuarine ecosystem have been based upon a full consideration of the impacts of the proposed alteration, except for the following uses and activities:

A. Natural Management Units
- Aquaculture
- Bridge crossings
- Log storage

B. Conservation Management Units
- Aquaculture
- Bulkheading
- Dike maintenance dredging
- High-intensity water-dependent recreation
- Log storage dredging
- Minor navigational improvements requiring dredging or fill
- Rip-rap

- Water intake or withdrawal and effluent discharge

C. Development Management Units
- Aquaculture
- Bulkheading (except for Aquatic Units #3DA, 5DA, and 6DA)
- Dredging
- Fill
- Flow lane disposal of dredged material
- In-water structures
- Mining and mineral extraction
- New or expanded log storage
- Water-related and nondependent, nonrelated uses not requiring fill

D. Any other uses and activities which require the resource capability consistency test as a condition within a particular management unit or which could affect the estuary's physical processes or biological resources. Unless fully addressed during the development and adoption of comprehensive plans, actions, which would potentially alter the estuarine ecosystem, shall be preceded by a clear presentation of the impacts of the proposed alteration.

Unless fully addressed during the development and adoption of comprehensive plans, actions, which would potentially alter the estuarine ecosystem, shall be preceded by a clear presentation of the impacts of the proposed alteration.

For uses and activities requiring the resource capabilities test, a special condition is noted in the applicable management unit uses/activities matrix. A determination of consistency with resource capability and the purposes of the management unit shall be based on the following:

A. A description of resources identified in the plan inventory;

B. An evaluation of impacts on those resources by the proposed use (see impact assessment procedure, below); and

C. In a natural management unit, a use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner to protect significant wildlife habitats, natural biological productivity, and values for scientific research and education.

D. In a conservation management unit a use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner which conserves long-term renewable resources, natural biologic productivity, recreational and aesthetic values and aquaculture.

The impact assessment need not be lengthy or complex, but it should enable reviewers to gain a clear understanding of the impacts to be expected. It shall include information on:

A. The type and extent of alterations expected;

B. The type of resource(s) affected;

C. The expected extent of impacts of the proposed alteration on water quality and other physical characteristics of the estuary, living resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary; and

D. The methods which could be employed to avoid or minimize adverse impacts.

This policy is based on the recognition that the need for and cumulative effects of estuarine developments were fully addressed during the preparation of this Plan and that, except as otherwise stated above, no additional findings are required to meet Implementation Requirement #1 of LCDC Goal 16.

Staff Response: CBEMP Policy #4 requires findings demonstrating the public's need and gain that would warrant any modification or loss to the estuarine ecosystem, based upon a clear presentation of the impacts of the proposed alteration, as implemented in Policy #4a. None of the prerequisites to providing notice to state agencies under Policy #4a are triggered. Therefore, this policy, to the extent that it is applicable, requires the City to perform the impacts assessment consistent with CBEMP Policy #4.

The applicant asserts that CBEMP Policy #4 is not applicable to the application pursuant to state law. The applicant notes that LUBA has held, and the Court of Appeals has affirmed, that "*[w]hen a goal exception is taken to facilitate proposed development, any comprehensive plan policies that implement the goal for which the exception is taken no longer govern that development.*" *Friends of Marion County, 59 Or LUBA at 350-351, aff'd 233 Or App at 488*. The applicant requests an exception to Goal 16 rezone a 3.3-acre zone from 52-NA to DDNC to facilitate dredging in an aquatic unit where it would not be permitted absent a zone change. As the last sentence of CBEMP Policy #4 clearly states, the purpose of this policy is to implement Goal 16. Staff agrees with this assertion by the applicant. If the goal 16 exception is denied, Policy #4 is irrelevant as the applicant will not be able to proceed with the plan and map change required to change an aquatic unit from natural to development, and as such dredging is not a permitted use in the natural aquatic designation.

Staff note that this project will require state and federal permits and an assessment of environmental impacts will be completed. Conditions of approval #1, #2, #4, and #13 address these requirements.

CBEMP Policy #4a - Deferral of (A) Resource Capability Consistency Findings and (B) Resource Impact Assessments

Local government shall defer, until the time of permit application, findings regarding consistency of the uses/activities listed in Policy #4 with the resource capabilities of the particular management unit.

Additionally, the impact assessment requirement for those uses/activities as specified in Policy #4 shall be performed concurrently with resource capability findings above at the time of permit application.

This strategy shall be implemented through an Administrative Conditional Use process that includes local cooperation with the appropriate state agencies such that:

A. Where aquaculture is proposed as a use, local government shall notify the Oregon Department of Fish and Wildlife (ODFW) in writing of the request, together with a map of the proposed site;

B. Where log storage dredging is proposed as an activity, local government shall notify the Oregon Department of Environmental Quality (DEQ) in writing of the request, together with a map of the proposed site.

Within twenty (20) days of receipt of the notification, ODFW or DEQ, as appropriate, shall submit in writing to local government a statement as to whether the proposed use/activity will be consistent with the resource capabilities of the management segment, or if determined to be not consistent, whether the proposal can be made consistent through imposition of conditions on the permit. The appropriate state agency shall also perform the impact assessment required in Policy #4. If no statement is received from the affected state agency by the expiration of the twenty (2) day period, local government shall presume consistency of the proposal with the resources capabilities of the management segment, shall make findings appropriate to the presumption, and shall perform the assessment of impacts required by Policy #4.

For all other uses/activities specified above, local government shall determine appropriate findings whether the proposed use/activity is consistent with the resource capabilities of the management segment and shall perform the assessment of impacts required by Policy #4.

This strategy recognizes:

A. That resource capability consistency findings and impact assessments as required by LCDC Goal #16 can only be made for the uses specified above at the time of permit application, and

B. That the specified state agencies have expertise appropriate to assist local government in making the required finding and assessments.

This strategy is based upon the recognition that the need for and cumulative effects of estuarine developments were fully addressed during development of this Plan and that no additional findings are required to meet Implementation Requirement #1 of Goal #16.

Staff Response: As noted above, because neither aquaculture nor log storage dredging are proposed, none of the prerequisites to providing notice to state agencies under Policy #4a are triggered. Therefore, this policy requires the City to perform the impacts assessment consistent with CBEMP Policy #4. The City has completed that assessment, including the content of the memo included as Attachment A, Exhibit 5, and the record to date.

As with Policy #4, the applicant asserts that CBEMP Policy #4a is not applicable to the application pursuant to state law. The applicant notes that LUBA has held, and the Court of Appeals has affirmed, that "[w]hen a goal exception is taken to facilitate proposed development, any comprehensive plan policies that implement the goal for which the exception is taken no longer govern that development." *Friends of Marion County, 59 Or LUBA at 350-351, aff'd 233 Or App at 488.* The applicant requests an exception to Goal 16 to facilitate dredging in a natural management unit. As the last sentence of CBEMP Policy #4 clearly states, the purpose of this policy is to implement Goal 16. Staff agrees with this finding by the Applicant.

VIII. Conditions of Approval

Staff has identified and recommends the following conditions for City Council consideration and Council action if authorization of the project proceeds:

Condition of Approval #1: Prior to the commencement of any dredging activities, JCEP shall provide the City of Coos Bay Community Development Administrator evidence of an approved Section 401 Water Quality Certification permit and evidence that the dredging complies with FEIS requirements, and all other state and federal requirements

Condition of Approval #2: JCEP shall receive written authorization to perform the proposed dredging from the National Marine and Fisheries Service in accordance with NMFS agency requirements. Proof of such authorization shall be submitted to the Coos Bay Community Development Administrator prior to the commencement of dredging activities.

Condition of Approval #3: Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall comply with the requirements of the enclosed MOA, CRPA, and UDP as agreed upon and signed by JCEP and the Confederated Tribes of Coos, Lower, Umpqua, and Siuslaw Indians, as well as consistency with any other provisions of Policy #18 of the CBEMP.

Condition of Approval #4: Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall obtain, and provide evidence of, all necessary ODEQ, DSL and Federal Section 404 authorizations. JCEP shall provide the City with copies of these approved authorizations for the record.

Condition of Approval #5: As a general condition, and in the event that additional analysis or circumstance reveals relevant and previously unknown or unmapped shoreland resources, all dredging activity must remain consistent with CBEMP Policy #17 - Protection of "Major Marshes" and "Significant Wildlife Habitat" in Coastal Shorelands.

Condition of Approval #6: As a general condition, dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit shall only occur during the ODFW approved in-water work window (IWWW) which occurs between October 1 and February 15. JCEP shall remove all equipment associated with dredging activities at the expiration of the IWWW. This condition shall remain in effect for all dredging periods that may span multiple years and multiple IWWWs.

Condition of Approval #7: Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities Permit, JCEP shall submit for review and approval by the City of Coos Bay Public Works/Community Development Department, the Best Management Practices, and compliance with CBMC Chapter 9.20 to minimize impacts.

Condition of Approval #8: Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities Permit, JCEP shall submit for review and approval by the City of Coos Bay Public Works/Community Development Department Best Management Practices that will be employed should turbidity levels remain above ambient background levels greater than 200 feet from dredging operations.

Condition of Approval #9: ***As a general condition, JCEP shall ensure all floating and submerged dredging equipment operating in the Bay shall be clearly marked with day signals and light signals at night in accordance with the US Inland Rules of the Road.***

Condition of Approval #10: ***As a general condition, JCEP construction safety inspectors shall be on-site during any time dredging operations are underway and shall be responsible for warning any recreational boaters who enter the construction area.***

Condition of Approval #11: ***As a general condition, JCEP shall ensure that sections of the pipeline that cross the Federal Navigation Channel (FNC) are submerged on the FNC bottom to allow for vessel passage. The sections of floating pipeline shall be temporarily removed to allow for vessel passage, when necessary.***

Condition of Approval #12: ***As a general condition, JCEP shall be responsible for costs of City review of information associated with project conditions.***

Condition of Approval #13: Prior to the issuance of an Estuarine and Coastal Shoreline Uses and Activities Permit, JCEP shall provide the City of Coos Bay Community Development Administrator evidence of an approved Final EIS.

Condition of Approval #14: City of Coos Bay Public Works has identified an existing utility that is installed under the Bay in the vicinity of the proposed navigational reliability improvements. Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall provide evidence to the Coos Bay Community Development Director, that the proposed dredging activity shall not impact this existing utility.

IX. Conclusion

Based on the evidence in the record, the City Council must conclude whether all applicable approval criteria for these applications are met, or not. The Planning Commission recommended approval findings for the 7 "Key Criteria" identified in this memo. Based on the evidence currently in the record, it is LCOG's perspective that, although some subjectivity exists, a recommendation for denial is the more supported conclusion. Staff have prepared an Agenda Item Summary which provides a more focused evaluation of key (subjective) criteria and approval or denial findings related to each criterion.

X. Attachments and Exhibits

Attachment A: Application(s)
Exhibit 1: NRI (Dredge Detail)
Exhibit 2: Pre-Application Conference Notes
Exhibit 3: Support Letters (Roseburg Forest Products, Coos Bay Pilots Association, Port)
Exhibit 4: Jordan Cove LNG Coast Guard Letter of Recommendation/Analysis
Exhibit 5: David Evans Memo describing dredge work and impacts
Exhibits 6 & 7: Site and Context Maps
Exhibit 8: Property Owner (DSL) Certification and Consent
Exhibit 9: Memorandum of Agreement between JCEP and the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians

Attachment B: Comprehensive Plan Update Map(s)
Attachment C: Confederated Tribe's comment regarding IWWW
Attachment D: First Open Record Period Matrix (synopsis of comments)
Attachment E: Second Open Record Period Matrix (synopsis of comments)

Attachment F: DEQ 6.9.3 DEQ Findings: Turbidity; 1.4 WQC Decision

Exhibit A.4: Draft Spill Prevention, Control and Countermeasure Plan (SPCC) – On City's website
Exhibit 29: Limitations of the Haynes Inlet Sediment Transport Study and Letters

Exhibit G.2: ECONorthwest Economic Analysis
Exhibit MM: Energy Conservation with NRIs in Place
Exhibit II: Marine Mammals
Exhibit JJ: Snowy Plover, Blue Heron, and Diving Waterfowl
Exhibit HH: Recreational Impacts and Mitigation
Exhibit GG: Eelgrass Baseline Information
Exhibit EE: Crustacean and Shellfish
Exhibit FF: Fish
Exhibit BB: Dredge Pollution Control Plan - On City's Website
Exhibit PP: Page 46
Exhibit PP: Pages 16-20

Public Works & *Community Development*
500 Central Ave., Coos Bay, Oregon 97420
Phone (541) 269-8918 Fax (541) 269-8916

NOTICE OF PLANNING COMMISSION RECOMMENDATION

APPLICATION: Land Use Application #187-18-000153

APPLICANT: Jordan Cove Energy Project L.P. (JCEP)

PROPOSAL:
(1) A map amendment to the Coos Bay Estuary Management Plan and zoning map to change the designation of approximately 3.3 acres from 52-NA to DDNC-DA;
(2) A text amendment to the City of Coos Bay Comprehensive Plan to take a reasons exception to Statewide Planning Goal 16 Estuarine Resources to authorize the map amendment;
(3) An estuarine and coastal shoreline uses and activities permit for "New and Maintenance Dredging" in the DDNC-DA Estuarine Zone; and
(4) An estuarine and coastal shoreline uses and activities permit to allow an accessory temporary dredge transport pipeline in the 52-NA, 53-CA, 54-DA, and 55-CA Estuarine Zones.

RECOMMENDATION: On Tuesday, July 23, 2019, the Planning Commission recommended, with the following motions/votes, findings and conditions, City Council approval of Land Use application #187-18-000153.

Motions and Votes

Motion #1
Motion made by Commissioner Miller and seconded by Commissioner Marineau:
I move to recommend Council approve the proposed text amendment to the City of Coos Bay Comprehensive Plan to take a reasons exception to Statewide Planning Goal 16 Estuarine Resources to authorize the map amendment.
Discussion: Hood asked if the current motion is related to the OAR's.
Yes: Commissioners Berg, Davis, Miller and Marineau
No: Commissioners Hood and Aguirre

Motion #2
Motion made by Commissioner Miller and seconded by Commissioner Marineau:
I move to recommend Council approve the proposed a map amendment to the Coos Bay Estuary Management Plan to change the designation of approximately 3.3 acres from 52-NA to DDNC-DA.
Discussion: Mr. Callister requested clarification that a motion to approve or deny implies that the Commission used the "Approval" or "Denial" column as outlined in the Staff Report Summary to support the decision.
Amended Motion: I move to recommend Council approve the proposed a map amendment to the Coos Bay Estuary Management Plan to change the designation of approximately 3.3 acres from 52-NA to DDNC-DA. with the noted facts and findings under approval.

Yes: Commissioners Berg, Davis, Miller and Marineau
No: Commissioners Hood and Aguirre

Motion #3
Motion made by Commissioner Marineau and seconded by Commissioner Davis:
I move to recommend Council approve the proposed estuarine and coastal shoreline uses and activities permit for "New and Maintenance Dredging" in the DDNC-DA Estuarine Zone based on the facts and findings as noted in the matrix grid under approval.
Yes: Commissioners Berg, Davis, Miller and Marineau
No: Commissioners Hood and Aguirre

Motion #4
Motion made by Commissioner Marineau and seconded by Commissioner Miller:
I move to recommend Council approve the proposed estuarine and coastal shoreline uses and activities permit to allow an accessory temporary dredge transport pipeline in the 52-NA, 53-CA, 54-DA, and 55-CA Estuarine Zones. based on the facts and findings as noted in the matrix grid under approval.
Discussion: Commissioner Miller clarified that the motion applies only to the 3.3. acres within the City of Coos Bay.
Yes: Commissioners Berg, Davis, Miller and Marineau
No: Commissioners Hood and Aguirre

Motion #5
Motion made by Commissioner Miller and seconded by Commissioner Marineau:
I move that Motion #1 be amended to include the clarification that the approval is based on the facts and findings as noted on Matrix page 5 & 6 for OAR 66-004-0020(d), OAR 660-004-0022(1)(a), OAR 660-004-002(8)(b) for approval.
Yes: Commissioners Berg, Davis, Miller and Marineau
No: Commissioners Hood and Aguirre

Motion #6
Motion made by Commissioner Miller and seconded by Commissioner Marineau
I move that Motions #1 through #4 include Conditions of approval 1-14, as referenced on pages 8 and 9 of the July 23, 2019 "Conditions of Approval Summary for application 187-18-000153.
Yes: Commissioners Berg, Davis, Miller and Marineau
No: Commissioners Hood and Aguirre

Findings and Conditions of Approval
The subject findings and conditions of approval referenced in Motion #6 include:

Findings:

Finding #1. Pursuant to the requirements of CBMC 17.360.060 (A)(2), the proposed amendment is in the public interest because the authorized amendment will result in a safer and more efficient navigation in the Bay and this affects the public interest in a net positive way.

Finding #2. With consideration to Statewide Planning Goal 2 – Land Use Planning requiring assurance of a factual basis for land use decision, the proposal is consistent with Goal 2 subject to conditions of approval that the project will meet all state and federal requirements.

Finding #3. With consideration to Statewide Planning Goal #6 - Air, Water and Land Resources Quality; it is reasonable to anticipate that the environmental quality standards can be met subject to securing an ODEQ Water Quality Certification Permit and a finding of no impact or mitigatable impact(s) in the Final Environmental Impact Statement.

Finding #4. With Consideration to OAR 660-004-0020 (d) which states that the proposed uses are to be compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts; the project will occur adjacent to the existing 52-NA designation area; however the CBEMP does not identify the marine organisms in area 52-NA as "uses."

Finding #5. With consideration to OAR 660-004-0022 (1)(a), there is a demonstrated need for the proposed use or activity based on one or more of the requirements of Goals 3 to 19. The exception to Goal 16 is necessary based on Goal 9 (Economic Development) and Goal 12 (Transportation) in that the proposal will bring about economic benefits and development and the NRIs will decrease transit delays and increase navigational safety for all transiting vessels in the Bay.

Finding #6. With consideration to OAR 660-004-002(8)(b), Dredging to maintain adequate depth to permit continuation of the present level of navigation in the area to be dredged. The requested Goal 16 exception is necessary based on Goal 9 (Economic Development) and Goal 12 (Transportation) in that the proposal will bring about economic benefits and development and the NRIs will decrease transit delays and increase navigational safety for all transiting vessels in the Bay.

Finding #7. With consideration to CBEMP Policy 5-E (Consistent with other requirements of state and federal law); it is reasonable to assume the proposal can meet the requirements of state and federal law. The proposal is consistent with the requirements of Goal 16 (Estuarine resources) because it represents a balance of estuary uses, protecting economic values of the estuary while minimizing adverse impacts and the approval of the Goal 16 exception is conditioned on completion of a Final EIS and the applicant obtaining all necessary DSL and Federal Section 404 Authorizations prior to any dredging activity.

Conditions of Approval

Condition of Approval #1: Prior to the commencement of any dredging activities, JCEP shall provide the City of Coos Bay Community Development Administrator evidence of an approved Section 401 Water Quality Certification permit and evidence that the dredging complies with FEIS requirements and all other state and federal requirements.

Condition of Approval #2: JCEP shall receive written authorization to perform the proposed dredging from the National Marine and Fisheries Service in accordance with NMFS agency requirements. Proof of such authorization shall be submitted to the Coos Bay Community Development Administrator prior to the commencement of dredging activities.

Condition of Approval #3: Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall comply with the requirements of the enclosed MOA, CRPA, and UDP as agreed upon and signed by JCEP and the Confederated Tribes of Coos, Lower, Umpqua, and Siuslaw Indians, as well as consistency with any other provisions of Policy #18 of the CBEMP.

Condition of Approval #4: Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall obtain, and provide evidence of, all necessary ODEQ, DSL and Federal Section 404 authorizations. JCEP shall provide the City with copies of these approved authorizations for the record.

Condition of Approval #5: As a general condition, and in the event that additional analysis or circumstance reveals relevant and previously unknown or unmapped shoreland resources, all dredging activity must remain consistent with CBEMP Policy #17 - Protection of “Major Marshes” and “Significant Wildlife Habitat” in Coastal Shorelands.

Condition of Approval #6: As a general condition, dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit shall only occur during the ODFW approved in-water work window (IWWW) which occurs between October 1 and February 15. JCEP shall remove all equipment associated with dredging activities at the expiration of the IWWW. This condition shall remain in effect for all dredging periods that may span multiple years and multiple IWWWs.

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Condition of Approval #8: Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities Permit, JCEP shall submit for review and approval by the City of Coos Bay Planning Department Best Management Practices that will be employed should turbidity levels remain above ambient background levels greater than 200 feet from dredging operations.

Condition of Approval #9: As a general condition, JCEP shall ensure all floating and submerged dredging equipment operating in the Bay shall be clearly marked with day signals and light signals at night in accordance with the US Inland Rules of the Road.

Condition of Approval #10: As a general condition, JCEP construction safety inspectors shall be on-site during any time dredging operations are underway and shall be responsible for warning any recreational boaters who enter the construction area.

Condition of Approval #11: As a general condition, JCEP shall ensure that sections of the pipeline that cross the Federal Navigation Channel (FNC) are submerged on the FNC bottom to allow for vessel passage. The sections of floating pipeline shall be temporarily removed to allow for vessel passage, when necessary.

Condition of Approval #12: As a general condition, JCEP shall be responsible for costs of City review of information associated with project conditions.

Condition of Approval #13: Prior to the issuance of an Estuarine and Coastal Shoreline Uses and Activity Permit, JCEP shall provide the City of Coos Bay Community Development Administrator evidence of an approved Final EIS.

Condition of Approval #14: The City of Coos Bay Public Works has identified an existing utility that is installed under the Bay in the vicinity of the proposed navigational reliability improvements. Prior to the commencement of any dredging associated with an Estuarine and Coastal Shoreline Uses and Activities permit, JCEP shall provide evidence to the Coos Bay Community Development Director, that the proposed dredging activity shall not impact this existing utility.

BEFORE THE LAND USE BOARD OF APPEALS

OF THE STATE OF OREGON

11/27/17 PM 2:07 LUBA

OREGON SHORES CONSERVATION COALITION,
Petitioner,

and

JOHN CLARKE, DEB EVANS, RON SCHAAF, ROGUE CLIMATE, HANNAH SOHL, STACEY McLAUGHLIN, JODY McCAFFREE, and THE CONFEDERATED TRIBES OF COOS, LOWER UMPQUA and SIUSLAW INDIANS,
Intervenors-Petitioners,

vs.

COOS COUNTY,
Respondent,

and

JORDAN COVE ENERGY PROJECT L.P.,
Intervenor-Respondent.

LUBA No. 2016-095

FINAL OPINION
AND ORDER

Appeal from Coos County.

Courtney Johnson, Portland, filed the petition for review and argued on behalf of petitioner. With her on the brief was Crag Law Center.

Kathleen P. Eymann, Bandon, filed a petition for review and argued on behalf of intervenor-petitioner John Clarke.

Tonia L. Moro, Medford, filed a petition for review and argued on behalf of intervenors-petitioners Deb Evans, Ron Schaaf, Rogue Climate and Hannah Sohl.

Jody McCaffree, North Bend, filed a petition for review and argued on her own behalf.

Stacy McLaughlin, Myrtle Creek, represented herself.

Denise Turner Walsh, Carlsbad, California, filed a petition for review on behalf of intervenor-petitioner Confederated Tribes of Coos Lower Umpqua and Siuslaw Indians. Richard K. Eichstaedt argued on behalf of the Confederated Tribes.

Keith A. Leitz, Coos County Legal Counsel, Coquille, filed a response brief and argued on behalf of respondent.

Seth J. King, Portland, filed response briefs and argued on behalf of intervenor-respondent. With him on the brief was Perkins Coie LLP.

BASSHAM, Board Member; RYAN, Board Chair; HOLSTUN Board Member, participated in the decision.

REMANDED 11/27/2017

You are entitled to judicial review of this Order. Judicial review is governed by the provisions of ORS 197.850.

Opinion by Bassham.

NATURE OF THE DECISION

Petitioner appeals a county board of commissioners' decision approving a conditional use permit for a liquified natural gas (LNG) export terminal at Jordan Cove in Coos County, near the city of Coos Bay.

INTRODUCTION

Petitioner Oregon Shores and several intervenors-petitioners filed petitions for review. With minor exceptions, the five petitions for review filed do not present overlapping challenges. Therefore, we provide here only a general summary of the facts and legal context. Specific facts and legal standards relevant to particular challenges are set out under the pertinent assignments of error.

In 2015, intervenor-respondent Jordan Cove Energy Project L.P. (JCEP) applied to the county to construct an LNG export terminal at Jordan Cove, located on the North Spit at Coos Bay, located in Coos County.[1] The proposed facility would receive approximately 1.04 billion cubic feet per day of natural

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[1] JCEP had previously obtained county approvals for an LNG import terminal. *See SOPIP, Inc. v. Coos County*, 57 Or LUBA 44, *aff'd* 223 Or App 495, 196 P3d 123 (2008), and *SOPIP, Inc. v. Coos County*, 57 Or LUBA 301 (2008). The county also approved a separate application for a 49.72-mile section of a natural gas pipeline to serve the LNG import terminal. *Citizens Against LNG v. Coos County*, 63 Or LUBA 162 (2011). Various components and iterations of the project have over the years generated a number of permits and decisions from several bodies, including proceedings before the Federal Energy Regulatory Commission (FERC).

gas via pipeline, liquify the gas to produce approximately 6.8 million metric tons of LNG, and load the LNG on tanker ships for export to international or domestic markets in the non-contiguous United States.

The LNG facility consists of a number of components, including (1) the LNG export terminal, (2) a marine slip and access channel, (3) a barge berth, (4) a gas processing center, and (5) a fire station and emergency training center, along with associated roads and utilities. The project would also require significant dredging, dredge disposal, shoreline stabilization, and wetland impact mitigation.

The terminal, gas processing facility, and fire station and emergency training center will be located on upland areas zoned for industrial uses. Much of the port facilities (slip, barge berth, tugboat dock, etc.) will be located in coastal shoreland areas, which are generally zoned to allow for water-dependent uses. The marine slip and access channel will require dredging in Jordan Cove, designated a natural estuary, and Henderson Marsh, a Statewide Planning Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) inventoried wetland.

The county hearings officer held a hearing on December 18, 2015, and held the record open thereafter for additional testimony and rebuttal. On May 2, 2016, the hearings officer issued a decision with recommendations to approve the applications. On August 16, 2016, the county board of commissioners held a public meeting to deliberate on the recommendations,

and voted to adopt the hearings officer's findings as the county's decision, with minor modifications. The county's final decision was issued on August 30, 2016. This appeal followed.

FIRST ASSIGNMENT OF ERROR (OREGON SHORES)

The Coos Bay Estuary Management Plan (CBEMP) governs the use of the Coos Bay estuary and adjacent shorelands, implementing Statewide Planning Goal 16 (Estuarine Resources). The CBEMP designates a number of estuarine resources in the Jordan Cove area. Some are designated as "Development" zones, others as "Natural" zones in which development, including dredging and filling, is limited or prohibited.

Under the first assignment of error, petitioner Oregon Shores Conservation Coalition (Oregon Shores) cites to testimony that development of the gas processing facility will involve placement of fill in the 7-NA (Natural Aquatic) zoning district, a zone that comprises much of Jordan Cove, in which placing fill is prohibited. According to Oregon Shores, the county adopted no findings addressing the proposal to place fill in the 7-NA zone to support the gas processing facility.

Intervenor-respondent JCEP (JCEP) responds that the application did not propose placing fill anywhere in the 7-NA zone. JCEP also notes that the county rejected testimony that the application proposes to place fill in the 7-NA zone. Record 197 (findings discussing an opponents' letter "arguing, incorrectly, that the applicant's map on page 407 shows that the applicant

intends to place fill in the 7-NA aquatic zone."). As far as we can tell, JCEP is correct that the application did not propose, and the decision does not approve, the placement of fill in the 7-NA zone.

The first assignment of error (Oregon Shores) is denied.

SECOND ASSIGNMENT OF ERROR (OREGON SHORES)
THIRD ASSIGNMENT OF ERROR (ROGUE INTERVENORS)[2]

The application proposes dredging within areas zoned 5-DA and 6-DA (Development Aquatic Management Units), to construct an access channel from the navigation channel to the marine slip. Such dredging is subject to CBEMP Policy 5(I),[3] which implements Goal 16, Implementation Requirement

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[2] We follow the parties in referring to intervenors-petitioners Deb Evans, Ron Schaaf, Rogue Climate, and Hannah Sohl as "Rogue Intervenors."

[3] CBEMP Policy 5(I) (Estuarine Fill and Removal) provides, in relevant part:

> "Local government shall support dredge and/or fill only if such activities are allowed in the respective management unit, and:
>
> "a. The activity is required for navigation or other water-dependent use that requires an estuarine location or, in the case of fill for non-water-dependent uses, is needed for a public use and would satisfy a public need that outweighs harm to navigation, fishing, and recreation, as per ORS 541.625(4) and an exception has been taken in this Plan to allow such fill.
>
> "b. A need (i.e., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights.
>
> "c. No feasible alternative upland locations exist; and

2 (Goal 16 IR2).[4] Under CBEMP Policy 5(I), dredging is allowed in the estuary only if, in relevant part, (1) it is "required for navigation or other water-dependent use that requires an estuarine location," and (2) a "need (i.e., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights."

In two sub-assignments under the second assignment of error, Oregon Shores challenges the county's findings that JCEP has demonstrated that dredging required for the marine slip and access channel will (1) provide a substantial public benefit, and (2) not unreasonably interfere with public trust rights. In their third assignment of error, intervenors-petitioners Rogue Intervenors advance additional arguments under both the "substantial public benefit" and "interference with public trust rights" standards.

"d. Adverse impacts are minimized."

[4] Goal 16, Implementation Requirement 2 provides, as relevant:

"Dredging and/or filling shall be allowed only:

"a. If required for navigation or other water-dependent uses that require an estuarine location or if specifically allowed by the applicable management unit requirements of this goal; and,

"b. If a need (i.e., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights; and

"c. If no feasible alternative upland locations exist; and,

"d. If adverse impacts are minimized."

A. Need/Substantial Public Benefit

Under CBEMP Policy 5(I)(a), the county found that the proposed dredging is required for a "water-dependent use that requires an estuarine location[,]" the water-dependent use being components of the LNG terminal. The Statewide Planning Goals define "water-dependent" in relevant part as "[a] use or activity which can be carried out only on, in, or adjacent to water areas because the use requires access to the water body for water-borne transportation, recreation, energy production, or source of water." *See* full quote at n 26, below. Oregon Shores does not challenge the county's finding that the LNG terminal is a "water-dependent" use for purposes of CBEMP Policy 5(I)(a) or Goal 16.[5]

With respect to CBEMP Policy 5(I)(b), Oregon Shores argues that the county misconstrued the need/substantial public benefit standard in three ways.[6] First, Oregon Shores argues that the county erred in interpreting CBEMP Policy 5(I)(b) to require evaluation only of the public benefits of the

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[5] However, as discussed below, intervenors-petitioners Rogue Intervenors challenges the conclusion that an LNG *export* terminal qualifies as a "water-dependent use" for purposes of Goal 16 and CBEMP Policy 5(I)(a).

[6] Because CBEMP Policy 5 implements Goal 16, on review the county's interpretations of the policy are not entitled to deference under ORS 197.829(1) or *Siporen v City of Medford*, 349 Or 247, 259, 243 P3d 776 (2010).

dredging activity itself, divorced from the public benefits of the land-based use that the dredging serves.[7]

We agree with Oregon Shores. If the "substantial public benefit" analysis is limited to evaluation of the public benefits of the dredge or fill activity itself, then the standard would never be met, as it is difficult to conceive of any public benefit from dredging or filling that is distinct from the use that dredging or filling serves. While the text of CBEMP Policy 5(I)(b) and Goal 16 IR2 is not entirely clear on this point, the context indicates that the four standards do not apply only to the proposed dredging or fill. We note that Goal 16 IR2(c) requires a finding that "no feasible alternative upland locations exist," which clearly contemplates evaluation of the proposed land use, not proposed dredging, since dredging does not generally take place on upland locations. We conclude that, contrary to the county's finding, CBEMP Policy 5(I)(b) requires the county to evaluate the substantiality of the public benefits provided by the use that the proposed dredging serves, in this case the LNG

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[7] The county's findings state on this point:

> "The Board concludes that the term 'need (substantial public benefit)' used in Goal 16 and CBEMP Policy #5 refers to a public benefit *for the dredging activity*, and does not require the applicant to prove that there is a public need or benefit for the underlying proposed land use (*i.e.*, a marine slip and ship terminal, or more generally, an LNG export facility.)." Record 86 (emphasis in original).

terminal, or at least those components of the terminal that are properly viewed as water-dependent uses.

Next, Oregon Shores argues that the county erred in interpreting CBEMP Policy 5(I)(b) to require evaluation only of the public benefits, and not to require any consideration of detriments or adverse impacts.[8] The county's interpretation of Policy 5(I)(b) is based on the observation that the adjoining Policy, CBEMP Policy 5(I)(a), expressly requires that the proponent of a non-water-dependent use demonstrate that there is a need for the use that "outweighs harm to navigation, fishing and recreation[.]" *See* n 3. As the findings note, this expressly required balancing test implements a statute. The county inferred that because CBEMP Policy 5(I)(b) does not expressly require a similar balancing test, the drafters of CBEMP Policy 5(I)(b) did not intend the county to engage in a similar balancing of benefits and detriments.

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[8] The county's findings state, in relevant part:

> "[T]he Board specifically rejects the argument that the [']public need/benefit' standard requires the County to balance need/benefit with (and weigh against) public detriments. In the previous sentence of Policy 5, the drafters required that an applicant for a non-water-dependent use to demonstrate that dredging and fill 'is needed for a public use and would satisfy a public need that outweighs harm to navigation, fishing and recreation.' That specific language did not come out of Goal 16, but rather is taken from ORS 196.825(4). Had the drafters of the CBEMP intended to impose a similar balancing test requirement on to the 'public need/benefit' standard, they could [] easily have done so (as they expressly did in the prior sentence), but they chose not to do so." Record 88.

As Oregon Shores argues, the question is not what the drafters of CBEMP Policy 5 intended, but what the drafters of Goal 16 IR2 intended, which CBEMP Policy 5(I)(b) implements almost verbatim. The text of Goal 16 IR2(b) does not expressly require balancing or weighing of benefits against detriments, but requires only a demonstration of a "substantial public benefit." That could be understood to represent a "net" public benefit, after consideration of both benefits and detriments. However, the fact that another implementation requirement, Goal 16 IR2(d), requires that "adverse impacts are minimized" suggests that potential adverse consequences of the proposed use are evaluated under a different standard. Given the absence of an express or a fairly implied requirement to balance or weigh benefits against adverse consequences under Goal 16 IR2(b), and the fact that adverse consequences are expressly addressed under a different standard, we decline to read Goal 16 IR(2)(b) to include an implicit requirement to balance or weigh public benefits of the proposed use against adverse consequences.

Finally, Oregon Shores challenges the county's view that the "need/substantial public benefit" standard is satisfied if the dredging activity is needed to construct a permitted or conditional use allowed on the nearby coastal shorelands or upland areas.[9] Oregon Shores argues that this

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[9] The county's findings state, in relevant part:

> "The Board believes that the 'need/substantial benefit' standard is met if the applicant demonstrates that the dredging or fill activity

interpretation conflates CBEMP Policy 5(I)(a) with 5(I)(b), and Goal 16 IR2(a) with IR2(b). According to Oregon Shores, the fact a water-dependent use is allowed on coastal shorelands under the county's zoning code does not automatically demonstrate that there is a "substantial public benefit" for purposes of CBEMP Policy 5(I)(b) and Goal 16 IR2(b).

We agree with Oregon Shores. CBEMP Policy 5(I)(a) and Goal 16 IR2(a) in relevant part require that the proposed dredging serve a water-dependent use allowed under the county's code. The county's view that the "need/substantial public benefit" standard in CBEMP Policy 5(I)(b) and Goal 16 IR2(b) is met simply by the fact that the proposed dredging serves a use allowed under the county's code, conflates CBEMP Policy 5(I)(a) and (b) and gives no independent effect to the latter. Even if the proposed dredging serves a water-dependent use allowed under the county's code, the county can allow

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> is needed to enable [construction of] a permitted or condition[al] use allowed in the neighboring coastal shoreland zone and related upland zones. In other words, Coos County has, via its enactment of the CBEMP (aka: Zoning Ordinance), set forth the panoply of uses that the County believes would serve a need and/or a substantial public benefit in each particular zone (*i.e.,* it has established a list of uses that are deemed to be appropriate in each zone in question.). If the applicant is proposing one of those favored uses, and there is a need to conduct fill or dredging activity in order to facilitate that favored use, then there is, *ipso facto*, a substantial benefit to allowing the applicant to conduct that fill/removal so that it can construct and operate the use." Record 88 (emphasis in original).

the dredging only if it also finds that the use provides a substantial public benefit.

B. Interference with Public Trust Rights

CBEMP Policy 5(I)(b) and Goal 16 IR2(b) also require that the proposed dredging does not unreasonably interfere with public trust rights. The public trust doctrine protects public access to and use of navigable waters and submerged lands, for navigation, fishing and commercial uses. *See, e.g., Weise v. Smith*, 3 Or 445, 450 (1869) (stating that navigable waters are "public highways" that each person has an "undoubted right to use * * * for all legitimate purposes of trade and transportation.").

1. Navigable Water

Oregon Shores first argues that the county erred by limiting the scope of public trust assets to submerged lands, and failing to include the waters overlaying those lands. JCEP responds that, while the findings cite to a circuit court case stating that the public trust doctrine protects only submerged lands, the findings in fact evaluate impacts on navigation and fishing and other uses of the navigable waters overlaying submerged lands. As discussed below, JCEP is correct that the county in fact evaluated impacts on navigation, fishing and other uses of navigable water, and did not limits its analysis to impacts on submerged lands.

2. Security Zone

Oregon Shores next challenges the county's findings regarding the impact of security zones around LNG tankers on commercial and recreational boat movements in the estuary. The application proposes that approximately 100 LNG tankers will traverse the Coos Bay Estuary to and from the LNG terminal per year. For each passage, the Coast Guard will impose a security zone extending 500 yards from the tanker in all directions, in which all other vessel movements are restricted. Oregon Shores argues that, because portions of the estuary are less than 1,000 yards wide, each tanker passage will completely halt navigation, fishing and commercial use of those portions of the estuary until the LNG tanker passes. Oregon Shores contends that the county's conclusion that the proposed security zone provisions will not unreasonably interfere with public trust rights relies on an inference from testimony in the record that is not supported by substantial evidence.

The record includes a statement from the Coast Guard that it will "allow vessels to transit the Safety/Security zone based on a case-by-case assessment conducted on scene." Record 3033. JCEP's consultant, Amergent Techs, interpreted this statement to mean that the Coast Guard would allow some boats to transit the security zone with minimal delay. Record 1817. In its findings, the county understood Amergent's testimony to be that all "known" boats would be allowed to transit the security zone without delay, presumably meaning only unknown boats will be delayed. Based on that understanding,

the county concluded that tanker passage would not unreasonably interfere with navigation or public trust access to the estuary.[10]

Nothing in the record cited to us explains the distinction between a "known" and "unknown" boat. That problem aside, as Oregon Shores argues, the county's understanding that all "known" boats would be able to transit the security zone with minimal delay is not supported by the Amergent Techs memo, much less by the Coast Guard statements in the record. Neither the Amergent Techs memo nor the Coast Guard statements suggest that the Coast Guard's case-by-case evaluation would rely on a distinction between "known" and "unknown" boats, and allow the former passage through the security zone

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[10] The county's findings state, in relevant part:

> "The testimony from Amergent Techs provides clarifications regarding the limited impacts caused by LNG vessel passage and docking in Coos Bay. Importantly, the memo clarifies that the Safety/Security zones are not 'exclusion zones.' Rather, they are regulated navigation areas. Essentially, that means that the Coast Guard will control traffic near the LNG ships but will still allow boat pilots [to] transit the zone on a case-by-case basis. The Board's understanding of this explanation is that the Coast Guard will let known vessels pass but can forcibly exclude vessels or delay [vessels] that it does not recognize. As a practical matter, local commercial fishermen operating known vessels should experience no significant delays as they will receive permission from the COTP [Captain of the Port] to proceed. Less frequent users of the bay, such as recreational boaters, may experience some delay as the COTP makes efforts to identify them and conduct a threat assessment. Given that clarification, the Board believes that there will be no unreasonable interference with public trust rights. * * *" Record 100-01.

without delay, although that may well be the case. The county's findings rely on its understanding of the Amergent Techs testimony as the primary basis for its conclusion that the transit of approximately 100 LNG tankers per year through the narrow estuary will not unreasonably interfere with navigation or public trust access to the estuary. JCEP argues that there is other evidence in the record that could support that conclusion, noting testimony that delay caused to recreational or fishing vessels by an LNG vessel would last only 20-30 minutes, and that the LNG transit times would be announced in advance, so local vessels could make plans to avoid the narrow portions of the estuary at those times. Record 3764. While that evidence could lend support to a finding that LNG tanker transit will not unreasonably interfere with public trust rights, the findings do not cite that evidence, and JCEP does not argue that that evidence is sufficient, in itself, to "clearly support[]" the county's decision on this point, in the absence of adequate findings. ORS 197.835(11)(b).[11] We

[11] ORS 197.835(11)(b) provides:

> "Whenever the findings are defective because of failure to recite adequate facts or legal conclusions or failure to adequately identify the standards or their relation to the facts, but the parties identify relevant evidence in the record which clearly supports the decision or a part of the decision, the board shall affirm the decision or the part of the decision supported by the record and remand the remainder to the local government, with direction indicating appropriate remedial action."

agree with Oregon Shores that remand is necessary for the county to adopt more adequate findings, supported by substantial evidence, on this point.

3. Adverse Impacts of Climate Change

Rogue Intervenors argue in their third assignment of error that the county erred in failing to consider the adverse impacts of climate change created by LNG shipped via the LNG terminal, in evaluating whether the proposed dredging serves a use that provides "substantial public benefits" and does not unreasonably interfere with public trust rights. Rogue Intervenors contend that in evaluating both standards the county must consider the impact of greenhouse gas emissions on ocean acidification, sea level rise and other climatic changes.

We disagree with Rogue Intervenors. As discussed above, the "substantial public benefits" standard does not include an implicit requirement to balance the public benefits of the proposed LNG terminal against detriments or adverse impacts of that use, much less consider the adverse effects of greenhouse gases on climate that could be attributed to the eventual consumption of the natural gas that is shipped to markets around the world via the LNG facility. Nor have Rogue Intervenors established that the public trust doctrine requires evaluation of the contributions of greenhouse gases attributable to consumption of natural gas shipped via the terminal.

The second assignment of error (Oregon Shores) is sustained, in part.

The third assignment of error (Rogue Intervenors) is denied.

THIRD ASSIGNMENT OF ERROR (OREGON SHORES)

As noted above, CBEMP Policy 5(I)(d) allows dredging in development aquatic management units (5-DA and 6-DA) only if "[a]dverse impacts are minimized." CBEMP Policy 5(II) provides that "[i]dentification and minimization of adverse impacts as required in [Policy 5(I)(d)] shall follow the procedure set forth in Policy 4." CBEMP Policy 4(I)(d) provides in relevant part that dredging and fill in development aquatic units must be supported by findings demonstrating "the public's need and gain which would warrant any modification or loss to the estuarine system, based upon a clear presentation of the impacts of the proposed alteration, as implemented in Policy #4a."[12] CBEMP Policy 4(II) sets out standards for an impact assessment.[13] CBEMP

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[12] CBEMP Policy 4(I)(d) provides, in part"

> "Where the impact assessment requirement (of Goal #16 Implementation Requirements #1) has not been satisfied in this Plan for certain uses or activities [as identified in Policy #4] then such uses or activities shall not be permitted until findings demonstrate the public's need and gain which would warrant any modification or loss to the estuarine ecosystem, based upon a clear presentation of the impacts of the proposed alteration, as implemented in Policy #4a."

[13] CBEMP Policy 4(II) provides, in relevant part:

> "An impact assessment need not be lengthy or complex, but it should give reviewers an overview of the impacts to be expected. It may include information on:
>
> "a. the type and extent of alterations expected;

Policy 4a includes additional requirements and procedures for the impact assessment.

Oregon Shores argues that the county failed to adopt any findings addressing CBEMP Policy 4 or 4a, or provide a "clear presentation of the impacts of the proposed alteration[.]" Oregon Shores notes that the record includes an analysis of the impacts of proposed dredging, prepared by David Evans & Associates (DEA), at Record 1900-03. However, Oregon Shores argues that the county did not adopt the DEA analysis as part of its findings, and further that the DEA analysis did not follow the procedure set out in CBEMP Policy 4a.

JCEP concedes that the county did not adopt findings directly addressing CBEMP Policy 4 or 4a, but argues that the record includes evidence that "clearly supports" a finding of compliance with those policies, and therefore the decision may be affirmed on this point notwithstanding inadequate findings, pursuant to ORS 197.835(11)(b). *See* n 11. JCEP argues that the record includes ample evidence that the "public's need and gain" would

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"b. the type of resource(s) affected;

"c. the expected extent of impacts of the proposed alteration on water quality and other physical characteristics of the estuary, living resources, recreation and aesthetic use, navigation, and other existing and potential uses of the estuary; and

"d. the methods which could be employed to avoid or minimize adverse impacts."

warrant any modification or loss to the estuarine system, in the forms of economic gains from the proposed terminal. CBEMP Policy 4(I)(d). JCEP contends that the DEA analysis at Record 1900-03 provides the "clear presentation of the impacts" of the proposed dredging that CBEMP Policy 4 requires, and LUBA should rely on the DEA analysis to conclude that CBEMP Policy 4 is met.

The "clearly supports" standard of review at ORS 197.835(11)(b) allows LUBA to overlook nonexistent or inadequate findings only if compliance with the applicable approval standard is "obvious" or "inevitable." *Marcott Holdings v. City of Tigard*, 30 Or LUBA 101 (1995). CBEMP Policy 4 requires the county to exercise considerable subjective judgment, including identifying "the public's need and gain," and determining whether that need or gain warrants modification or loss to the estuarine system, and to ensure that impacts of the proposed alteration are minimized or mitigated. ORS 197.835(11)(b) does not authorize LUBA to affirm decisions based on LUBA's evaluation of evidence under standards such as CBEMP Policy 4, which require the exercise of significant subjective judgment. Accordingly, we agree with Oregon Shores that remand is necessary for the county to adopt findings addressing compliance with CBEMP Policy 4 and 4a.

The third assignment of error (Oregon Shores) is sustained.

FOURTH ASSIGNMENT OF ERROR (OREGON SHORES)

Proposed development in coastal shorelands, in the 6-WD (Water-Dependent Development Shorelands) and 7-D (Development Shorelands) zones, is subject to compliance with CBEMP Policy 30, which requires in relevant part that the county justify development in these areas "only upon the establishment of findings that shall include at least * * * [m]ethods for protecting the surrounding area from any adverse effects of the development[.]" CBEMP Policy 30(I)(c).[14] This language implements Statewide Planning Goal 18 (Beaches and Dunes), Implementation Requirement 1(c) (Goal 18 IR1(c)).

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[14] CBEMP Policy 30(I) provides:

> "Coos County shall permit development within areas designated as 'Beach and Dune Areas with Limited Development Suitability' on the Coos Bay Estuary Special Considerations Map only upon the establishment of findings that shall include at least:
>
> "a. The type of use proposed and the adverse effects it might have on the site and adjacent areas;
>
> "b. Temporary and permanent stabilization programs and the planned maintenance of new and existing vegetation;
>
> "c. Methods for protecting the surrounding area from any adverse effects of the development; and
>
> "d. Hazards to life, public and private property, and the natural environment which may be caused by the proposed use; and

JCEP's consultant prepared a site investigation report addressing CBEMP Policy 30(I), which identified "erosion and migration of disturbed dune sands from the site" as an adverse effect of development for purposes of CBEMP Policy 30(I)(c). To identify "methods for protecting" the surrounding beach and dune areas from those adverse impacts, the report relied on "State DEQ and FERC permits that require mitigation of erosion, re-vegetation, and monitoring of permanent stabilization measures." Record 9801.

Oregon Shores argues that the report fails to identify methods for "protecting" surrounding beaches and dunes from the identified adverse impacts. According to Oregon Shores, the term "protect[]" as used in CBEMP Policy 30(I)(c) and Goal 18 IR1(c) has the same meaning as the term "protect" as defined in the statewide planning goals, *i.e.,* "[s]ave or shield from loss, destruction, or injury for future intended use." Oregon Shores notes that LUBA has interpreted the term "protect" as used in the context of Goal 16 to require measures that will reduce the adverse impacts of development to a *de minimis* or insignificant level. *Columbia Riverkeeper v. Clatsop County*, 61 Or LUBA 96, 111, *aff'd* 238 Or App 439, 464-65, 243 P3d 82 (2010). Oregon

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> "e. Whether drawdown of groundwater would lead to loss of stabilizing vegetation, loss of water quality, or intrusion of saltwater into water supplies.
>
> "Implementation shall occur through an administrative conditional use process which shall include submission of a site investigation report by the developer that addresses the five considerations above."

Shores contends that mitigation and monitoring do nothing to reduce impacts to a *de minimis* level.

JCEP responds that the report describes more than mitigation and monitoring, but also prescribes re-vegetation and stabilization measures to reduce erosion and migration of disturbed sand. Record 9800-01. Oregon Shores does not present any argument regarding why the proposed re-vegetation and stabilization of soils are insufficient to ensure compliance with CBEMP Policy 30(I)(c). Absent a more developed argument, we agree with JCEP that Oregon Shores fails to explain why re-vegetation and stabilization measures are insufficient to satisfy CBEMP Policy 30(I)(c).

Oregon Shores also argues that the county erred in dismissing concerns raised by Oregon Shores and the State of Oregon regarding potential subsidence from dewatering activities during construction of the tank/slip facilities within the 6-WD zone. Record 7751, 8178. The county concluded that subsidence or site stability due to dewatering is not an issue that is within the scope of the only provision of the policy that explicitly addresses impacts on groundwater, CBEMP Policy 30(I)(e). *See* n 14; record 135. Oregon Shores argues, however, that subsidence due to dewatering is a potential issue under CBEMP Policy 30(I)(c), because it could constitute an "adverse effect[] of the development" on the surrounding area within the meaning of subsection (c).

JCEP responds that the county adopted an alternative finding that the proposed groundwater dewatering is "within historic levels that did not lead to the loss of stabilizing vegetation," and that Oregon Shores failed to challenge that alternative finding. Record 135. However, the quoted finding addresses "loss of stabilizing vegetation," which is an issue addressed under CBEMP Policy 30(I)(e). *See* n 14. Oregon Shores' argument is based on the language of CBEMP Policy 30(I)(c). If there are findings concluding that subsidence from proposed dewatering is not a potential issue under CBEMP Policy 30(I)(c), JCEP does not cite them. We conclude that remand is necessary to address whether subsidence is a potential issue under CBEMP Policy 30(I)(c) and, if so, adopt findings resolving that issue.

Finally, Oregon Shores argues that the finding of compliance with CBEMP Policy 30(I)(c) relies on the applicant obtaining FERC permits, but notes that FERC has denied JCEP the permits for the proposed LNG terminal. This issue is raised under the sixth assignment of error, and we address it there.

The fourth assignment of error is sustained in part.

FIFTH ASSIGNMENT OF ERROR (OREGON SHORES)

The county approved placing fill in the 7-D (Development Shorelands) zone, which is subject to "special conditions" at Coos County Land Development Ordinance (LDO) 3.2.286. Special Condition 5 states that "[t]he wetland in the southeast portion of this district can be filled for a development project contingent upon satisfaction of the prescribed mitigation described in

Shoreland District #5." The county's finding of compliance with Special Condition 5 states:

> "The Board finds that the application proposes fill in the southeast portion of this district for a development project and will mitigate in accordance with all prescribed mitigation. Therefore, the Board finds that the proposed fill is consistent with Special Condition 5." Record 70.

Oregon Shores argues that the foregoing finding is inadequate and not supported by substantial evidence, because the county failed to identify the proposed mitigation, or explain how the proposed mitigation satisfies the "prescribed mitigation described in Shoreland District #5."

JCEP does not dispute that the above-quoted finding is inadequate, but argues that no party raised any issue under Special Condition 5 during the proceedings below, and thus no party can challenge on appeal whether the county's finding of compliance with Special Condition 5 is adequate, pursuant to ORS 197.763(1).

Oregon Shores replies that a participant submitted testimony below that at one point quotes Special Condition 5 and at another point raises objections to proposed mitigation at the West Jordan Cove Mitigation Site, which is apparently where the application proposed to conduct mitigation. Record 5984. While that testimony does not advance any specific issues under Special Condition 5, it is sufficient to allow Oregon Shores to challenge the adequacy of the county's findings addressing Special Condition 5. *Lucier v. City of Medford*, 26 Or LUBA 213, 216 (1993).

On the merits, we agree with Oregon Shores that the county's only finding of compliance with Special Condition 5 is conclusory and inadequate. The findings do not identify the proposed mitigation for fill in the wetland in the southeast portion of the 7-D district, or relate it in any way to "the prescribed mitigation described in Shoreland District #5." Remand is necessary for the county to adopt more adequate findings on this point.

The fifth assignment of error (Oregon Shores) is sustained.

SIXTH ASSIGNMENT OF ERROR (OREGON SHORES)

Oregon Shores argues that the county found compliance with CBEMP Policies 5, 8 and 30 based in part on the condition that JCEP obtain and comply with state and federal permits, including FERC permits.[15] However, Oregon Shores cites testimony that on March 11, 2016, during the proceedings before the hearings officer, FERC denied JCEP's application for a permit for the proposed LNG terminal. Because the required FERC permits have been denied, Oregon Shores argues, the county erred in relying on FERC permits to demonstrate compliance with applicable approval criteria. *See Bouman v. Jackson County*, 23 Or LUBA 626, 647 (1992) (where a local government

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[15] Oregon Shores advances a similar challenge to the county's findings of compliance with CBEMP Policy 17. However, in response to intervenor's waiver challenge Oregon Shores concedes that no issues were raised below under CBEMP Policy 17. Intervenor also argues that no issues were raised below under CBEMP Policy 30, but in its reply brief Oregon Shores cites to locations in the record where issues of compliance with Policy 30 were raised.

relies on the applicant obtaining state agency permits, the record must include substantial evidence that the applicant is not precluded as a matter of law from obtaining the state agency permits).

JCEP responds that at the time of the county's decision JCEP's request for FERC to reconsider its denial was still pending, and thus the record at that time included substantial evidence that JCEP was not precluded as a matter of law from obtaining the required FERC permits. JCEP acknowledges that FERC later denied its request for reconsideration, but argues the decision denying reconsideration post-dates the county's decision and thus is not in the evidentiary record (although LUBA has taken official notice of the decision denying reconsideration). JCEP also notes that LUBA has taken official notice of the fact that JCEP has initiated a pre-filing with FERC, which is a necessary step to filing a new application for a FERC permit. Thus, JCEP argues that even if LUBA looks beyond the evidentiary record there is no reason to conclude that JCEP is precluded, as a matter of law, from obtaining FERC permits for the LNG terminal.

The county's findings observe that "[i]f it stands" FERC's March 11, 2016 permit denial decision "may very well kill the entire project, at least for the time being." Record 83. The findings note, however, that the primary basis for denial (lack of LNG contracts) could potentially be remedied, and further noted that JCEP had appealed the March 11, 2016 denial. *Id.* However, the findings do not appear to address whether or not the March 11, 2016 denial

means that JCEP is precluded, as a matter of law, from obtaining FERC permits for the LNG terminal. As noted, with respect to several policies the findings expressly rely on JCEP obtaining FERC permits in order to satisfy applicable county criteria. In our view, given that the required FERC permit had, in fact, been denied during the proceeding before the county, the county erred in adopting findings of compliance with local approval standards that are unconditionally predicated on the applicant obtaining a FERC permit, without first addressing whether the denial means that JCEP is precluded, as a matter of law, from obtaining the FERC permit. Remand is necessary for the county to consider that question, and on remand the county may consider the FERC decisions or applications that post-date the county's decision in this appeal.

The sixth assignment of error (Oregon Shores) is sustained.

SEVENTH ASSIGNMENT OF ERROR (OREGON SHORES)

JCEP proposes to construct the Southwest Oregon Regional Safety Center (SORSC) on a parcel zoned for industrial and water-dependent uses.[16] The SORSC is a large "multiorganizational office complex" on eight acres that includes a fire station as one component. Record 143-44. A fire station is a permitted use in the industrial zone. Record 143. The proposed fire station would have a daily staff of four persons. Record 9826. The SORSC also

[16] Apparently, the SORSC facility is intended to meet the requirements of a 2014 Memorandum of Understanding entered into between intervenor and the State of Oregon.

includes a number of other components, including (1) offices for the Coos County sheriff, Coast Guard, and Port of Coos Bay, (2) a security center, (3) a personal safety access point (apparently a type of emergency call center), and (4) a training center for the sheriff and Southwestern Oregon Community College. Record 144. These uses would have a daily staff of approximately 12 persons. The training center includes classrooms to train up to 100 persons. Record 9826. All the latter components of the SORSC are not allowed uses in the industrial zone. However, the county approved them as "accessory uses" to the fire station.

According to the county's decision, LDO 2.1.200 defines "accessory uses" as uses that (1) are subordinate to and serve a principal use; (2) subordinate in area or purpose to that principal use; (3) contribute to the comfort, convenience, or necessity of occupants of the principal use; and (4) are located on the same unit of land as the principal use. Record 144.[17] The

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[17] The version of the LDO 2.1.200 definition of "accessory use" available on the county's website is different than the version paraphrased in the decision, perhaps reflecting an inaccurate paraphrase, or more recent amendments. The website version states:

> "ACCESSORY USE: A use, building or structure that is (1) customarily incidental and subordinate to the principal use, main building or structure, and (2) subordinate in extent, area and purpose to the principal use. A use that constitutes, in effect, conversion to a use not permitted in the district is not an accessory use."

county rejected arguments that the various SORSC components are not "subordinate" to the fire station:

> "The SORSC serves, and is subordinate in purpose to, the Fire Station because the SORSC is a training center for firefighters who will work at the Fire Station. The SORSC contributes to the comfort and convenience of the firemen who utilize the Fire Station because the SORSC offers training to current and future firefighters. * * *
>
> "* * * * *
>
> "* * * Although the SORSC will house government offices for the Coos County Sheriff, the Coast Guard, and the Port, these 'offices' are permitted in conjunction with a permitted or conditionally permitted use. [LDO] 4.4.200(26). In this regard, this is no different than a fast food restaurant that has a manager's office—the office is not a separate land use from a restaurant but is rather an inherent part of the restaurant. In this case, the offices will occur in conjunction with the Fire Station, which is a permitted use under [LDO 4.4.200(20). * * *" Record 144.

Oregon Shores argues that the county's finding that the SORSC is "subordinate" to the fire station misconstrues the applicable law and is not supported by substantial evidence. According to Oregon Shores, no reasonable person could conclude that the various government office and educational components that make up the bulk of the SORSC, including a regional training facility for up to 100 persons, are "subordinate" to a local fire station staffed by four firefighters.

JCEP responds that the county's interpretation of the code term "accessory use" is not inconsistent with the express language of that term, as defined, and must be affirmed under the deferential standard of review that

LUBA must apply to a governing body's code interpretations, under ORS 197.829(1) and *Siporen*, 349 Or at 259.[18] JCEP argues that the county viewed the SORSC office components to be an enhancement to the fire station, finding that "offices for public safety and security entities * * * will have a role in responding to fire and other natural events as service providers." Record 144. With respect to the training center, JCEP does not dispute that it will function as a training center for fire fighters and other emergency responders from around the region, not limited to training staff at the fire station, but argues that

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[18] ORS 197.829 provides:

> "1. [LUBA] shall affirm a local government's interpretation of its comprehensive plan and land use regulations, unless the board determines that the local government's interpretation:
>
> "(a) Is inconsistent with the express language of the comprehensive plan or land use regulation;
>
> "(b) Is inconsistent with the purpose for the comprehensive plan or land use regulation;
>
> "(c) Is inconsistent with the underlying policy that provides the basis for the comprehensive plan or land use regulation; or
>
> "(d) Is contrary to a state statute, land use goal or rule that the comprehensive plan provision or land use regulation implements.
>
> "2. If a local government fails to interpret a provision of its comprehensive plan or land use regulations, or if such interpretation is inadequate for review, [LUBA] may make its own determination of whether the local government decision is correct."

the LDC definition of "Accessory Uses" does not require that an accessory use serve *only* the principal use.

The county's "interpretation" is conclusory, and largely inadequate for review. The findings do not attempt to explain the meaning of "subordinate" and the other key terms in the LDO 2.1.200 definition of "accessory use," and the rationales offered for the county's conclusion are strained at best. The findings analogize the proposed government offices (sheriff, port, coast guard) to the offices for a primary business use, providing the example of an office for a restaurant. The flaw in that analogy is that the proposed government offices are not "offices" for the fire station. It may be true that staff in the government offices will occasionally provide support for the fire station, during an emergency, for example. But that is not the *function* of those government offices; any support the offices might provide to the fire station in an emergency would be, at best, ancillary to the offices' main function. Even if, as JCEP argues, the LDO 2.1.200 definition of "accessory use" does not limit an accessory use to serving *only* the primary use, it is difficult to understand how a use can be viewed as "accessory" to the primary use when any support or service it provides to the primary use is ancillary, and the purported "accessory" use has a main function that has nothing to do with the primary use.

Similarly, with respect to the regional training center, the fact that the four firefighters staffing the fire station may take classes at the 100-seat

training center does little to demonstrate that the training center is "subordinate" to the fire station, under any conceivable interpretation of that term. LDO 2.1.200 requires that the accessory use be "subordinate in area or purpose to that principal use[.]" However, the findings do not discuss whether any of the SORSC components are subordinate in "area" or "purpose" to the fire station. The findings do not describe how much area is occupied by the fire station, versus the area occupied by other SORSC components, or discuss the purpose of those components, and to what extent those components "serve" the fire station, as opposed to serving other purposes.[19]

Because the findings are conclusory and do not address key language and considerations in the code definition of "accessory use," it is hard to say whether the county's conclusion that the SORSC components are accessory to the fire station embodies an interpretation of LDO 2.1.200 that is inadequate for review, or an interpretation that is simply implausible, *i.e.,* inconsistent with the express language, purpose and policy underlying LDO 2.1.200. To the extent the county's decision interprets LDO 2.1.200 to the effect that a use is "subordinate" to a primary use as long as it provides some support to the primary use, regardless of how minimal and tangential that support is compared

[19] As far as we can tell, the findings do not discuss the proposed security center, or the personal safety access point (which we understand to be a type of emergency call center). It is possible that these uses are allowed in the industrial zone under the category of "emergency services," a permitted use that includes the proposed fire station. LDO 4.4.210(4). However, without findings about the nature of these uses, it is hard to tell.

to the putative accessory use's purpose and function, we reject the interpretation as implausible.

We do not intend to foreclose the possibility that the board of commissioners can adopt an interpretation of LDO 2.1.200 that is sustainable under the deferential standard of review we apply under ORS 197.829(1)(a), supporting a conclusion that some or all of the SORSC components are "accessory" to the fire station, as defined at LDO 2.1.200. However, the present decision includes no such interpretation. Further, any sustainable interpretation of LDO 2.1.200 must give effect to all of its applicable terms. The findings do not include an interpretation, at least one adequate for review, explaining why the proposed SORSC components are subordinate to and serve a principal use, and subordinate in area or purpose to that principal use. Or, in the words of the version of LDO 2.1.200 on the county's website, whether the SORSC uses are "customarily incidental and subordinate to the principal use," and "subordinate in extent, area and purpose to the principal use." *See* n 17. Because it may be possible on remand for the county to adopt a more sustainable interpretation under which at least some components of the SORSC can be viewed as subordinate to the fire station use, we conclude that it is appropriate to remand this issue to the county for further proceedings.

The seventh assignment of error (Oregon Shores) is sustained.

FIRST ASSIGNMENT OF ERROR (McCAFFREE)

Intervenor-petitioner Jody McCaffree (McCaffree) argues that (1) the county commission chair, Sweet, was biased in favor of the proposed LNG terminal and (2) the county commissioners failed to declare *ex parte* communications.

A. Bias

McCaffree alleges that Chair Sweet was biased in favor of the proposed LNG terminal. According to McCaffree, on April 22, 2016, Chair Sweet sent a letter, on county letterhead, to FERC expressing support for the Jordan Cove LNG terminal and Pacific Connector Pipeline Project applications then pending before FERC. Supplemental Record 527. In addition, McCaffree quotes Chair Sweet as making public statements in support of the Jordan Cove project. *Id.* at 529-30. McCaffree contends that the letter and statements demonstrate that Chair Sweet was incapable of deciding the land use application pending before the county with the requisite impartiality.

In order to succeed in a bias claim, the petitioner must first establish that the evidence of bias offered by petitioner relates to the "matter" before the tribunal. *Columbia Riverkeeper v. Clatsop County*, 267 Or App 578, 608-10, 341 P3d 790 (2014). The "matter" is "precisely and narrowly defined," as the individual land use decision that the county board of commissioners considered and decided in the local proceeding. *Id.* at 608.

Second, in order to disqualify a decision-maker from participating, a party must meet the "high bar for disqualification," demonstrating that "actual bias" has occurred, not simply an "appearance of bias." *Columbia Riverkeeper*, 267 Or App at 610; *cf. Friends of Jacksonville v. City of Jacksonville*, 42 Or LUBA 137 (2002) (finding actual disqualifying bias occurred when a city council member stated during his election campaign that he could not be objective in reviewing a pending application were he to be elected).

Finally, to demonstrate actual bias, the petitioner must establish that "the decision maker has so prejudged the particular matter as to be incapable of determining its merits on the basis of the evidence and arguments presented." *Columbia Riverkeeper*, 267 Or App at 602. To demonstrate actual bias, petitioner must identify "explicit statements, pledges, or commitments that the elected local official has prejudged the specific matter before the tribunal." *Id.* at 609-10.

We disagree with McCaffree that Chair Sweet's April 11, 2016 letter, or his public statements, demonstrate that Chair Sweet was incapable of determining the merits of the land use application based on the evidence and arguments presented. As the Court of Appeals recently explained in *Columbia Riverkeeper*, 267 Or App at 599:

> "A judge is expected to be detached, independent and nonpolitical. A county commissioner, on the other hand, is expected to be intensely involved in the affairs of the community. He is elected because of his political predisposition, not despite it, and he is expected to act with awareness of the needs of all elements of the

> county, including all government agencies charged with doing the business of the people.
>
> "* * * * *
>
> "The goal of [the *Fasano v. Washington County Commission*, 264 Or 574, 588, 507 P2d 23 (1973) impartiality requirements] is that land-use decisions should be made fairly. * * * *Fasano* cannot be applied so literally that the decision-making system is aborted because an official charged with the public duty of adjudication fears that his motivation might possibly be suspect." (Internal citations and quotation marks omitted).

As far as McCaffree has established, Chair Sweet's statements of support of the LNG terminal represent no more than the general appreciation of the benefits of local economic development that is common among local government elected officials. Those statements fall far short of demonstrating that Chair Sweet was not able to make a decision on the land use application based on the evidence and arguments of the parties.

B. *Ex Parte* Communications

McCaffree also argues that the commission erred by failing to disclose the contents of Chair Sweet's April 11, 2016 letter to FERC during the proceedings below, and by failing to disclose that Chair Sweet attended a luncheon in 2014 at which JCEP's representative offered a presentation about the proposed LNG terminal. Another commissioner, Main, also attended the luncheon, and disclosed that he had attended the luncheon and heard the presentation, which he characterized as general in nature.

ORS 215.422(3) provides:

> "No decision or action of a planning commission or county governing body shall be invalid due to ex parte contact or bias resulting from ex parte contact with a member of the decision-making body, if the member of the decision-making body receiving the contact:
>
> "(a) Places on the record the substance of any written or oral ex parte communications concerning the decision or action; and
>
> "(b) Has a public announcement of the content of the communication and of the parties' right to rebut the substance of the communication made at the first hearing following the communication where action will be considered or taken on the subject to which the communication related."

In response, JCEP argues, and we agree, that the letter from Chair Sweet to FERC does not qualify as *ex parte* contact for two reasons. First, the letter from Chair Sweet to FERC is not "*ex parte* contact" because it does not "concern[] the decision or action" made by the county commission as required by ORS 215.422(3)(a), but rather it concerns a separate decision or action by FERC. Second, the letter from Chair Sweet does not qualify as an "*ex parte* contact" because the letter was *from* Chair Sweet *to* FERC. As the text of ORS 215.422(3) indicates, the statute only governs required disclosures when the decision-maker "receiv[es] the contact." As a result, no disclosure of the April 11, 2016 letter was required pursuant to the statute.

With respect to Chair Sweet's attendance at a 2014 luncheon presentation by JCEP on the LNG project, intervenor does not dispute that Sweet failed to disclose the content of the presentation, which the other

attending commissioner, Main, treated as an *ex parte* communication. It may be that the presentation does not qualify as an *ex parte* communication, or if so that Main's disclosure was sufficient for both commissioners. However, because the county's decision must be remanded for other reasons, it is appropriate to remand also to allow Chair Sweet to disclose the substance of any *ex parte* communications that occurred at the presentation.

The first assignment of error (McCaffree) is sustained, in part.

SECOND ASSIGNMENT OF ERROR (McCAFFREE)

In her second assignment of error, McCaffree argues that in the proceedings below, the county hearings officer misapplied applicable law and prejudiced McCaffree's rights due to bias against unrepresented parties. Citing to various statements by the hearings officer, McCaffree argues that the statements demonstrate a bias in favor of testimony coming from attorneys for the project applicant, over testimony from unrepresented project opponents. According to McCaffree, the hearings officer's bias against unrepresented opponents violated Statewide Planning Goal 1 (Citizen Involvement).

JCEP responds that McCaffree failed to preserve the issue by objecting before the local decision-maker. Even if the issue is preserved, JCEP argues that McCaffree has failed to demonstrate that the hearings officer was biased, or that any bias prejudiced McCaffree's procedural rights. Further, JCEP argues that McCaffree has failed to establish that any error committed by the hearings officer tainted the county commission's consideration and final

decision. Finally, JCEP argues that Goal 1 is not directly applicable to the proposed permit applications.

It is not clear to us that a decision-maker's bias is properly viewed as a *procedural* error, even if evidence of the alleged bias stems from comments made by the decision-maker during a hearing. McCaffree does not identify any *procedure* that the hearings officer failed to follow. In any case, as we understand, some of the unrepresented parties below objected to the hearings officer's apparent preference for argument from represented parties.[20] To the extent preservation principles require lodging an objection to the alleged bias of the hearings officer against unrepresented parties, an objection was made.

On the merits, we have no trouble agreeing with McCaffree that the hearings officer's comments regarding the testimony were unnecessary and unfortunate. Nonetheless, we do not believe that those comments are sufficient to demonstrate that the hearings officer was biased in the sense that the hearings officer was unable to make a decision based on the arguments and evidence presented. Moreover, even if we concluded that the hearings officer was biased, JCEP is correct that the hearings officer was not the final county decision-maker. McCaffree offers no argument as to why the hearings officer's alleged bias tainted the proceedings before, or the decision of, the board of

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[20] After the hearings officer expressed a preference for hearing testimony from represented parties, one participant stated: "I'm not going to waste my time [testifying before the hearings officer]. I am not an attorney and you ain't going to listen to me anyway[.]" McCaffree Petition for Review 18.

commissioners, the final decision-maker. Accordingly, McCaffree's arguments under this assignment of error do not provide a basis for reversal or remand.

The second assignment of error (McCaffree) is denied.

THIRD ASSIGNMENT OF ERROR (McCAFFREE)

In her third assignment of error, McCaffree argues that the findings adopted by the county commissioners demonstrate bias in favor of the application, because the findings generally cite and rely on evidence submitted by proponents, and ignore or erroneously discredit opposing evidence.

As an example, McCaffree argues that the county chose to rely on a report from one of JCEP's experts (Sullivan) regarding sedimentation from dredging, notwithstanding that Sullivan is a landscape architect and not an engineer, while rejecting the opponent's expert testimony (Ravens) from a licensed engineer. The Ravens testimony had been submitted in an earlier proceeding related to the LNG pipeline, but the county chose not to rely upon it in that proceeding. McCaffree submitted the Ravens testimony again in this present proceeding on the LNG terminal. According to McCaffree, the county's rejection of the Ravens testimony and reliance on a report filed by a landscape architect indicates that county decision-makers were biased in favor of the applicant.

JCEP responds that the Sullivan report was prepared by multiple authors including an environmental specialist, and a biologist. Record 1907-08. Further, JCEP argues that, while the county chided McCaffree for

mischaracterizing the testimony of the opponents' engineer regarding sedimentation, the county in fact accepted and considered that testimony, and did not reject it.[21] JCEP argues that simply because the commissioners did not find the Ravens testimony persuasive does not mean that the commissioners were biased or that the Ravens testimony does not constitute substantial evidence.

Although couched as an argument regarding "bias," McCaffree's arguments can be more accurately described as a substantial evidence challenge. JCEP argues, and we agree, that McCaffree's arguments regarding how the county weighed the evidence regarding sedimentation does not demonstrate that the county was "biased" in favor of the application or, more accurately, that the county's findings regarding sedimentation are not supported by substantial evidence.

The third assignment of error (McCaffree) is denied.

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[21] The county's findings state, in relevant part:

> "On page 23 of her letter dated January 12, 2016, Ms. McCaffree cites to previously submitted testimony from Dr. Tom Ravens, and states that '[o]ur sedimentation expert actually proved [Pacific Connector] to be wrong on this issue * * *.' This statement is demonstrably false. In fact, the hearings officer [in a different decision] previously rejected Dr. Ravens' analysis. *See* Hearings Officer Recommendation HBCU 10-01 (Remand) at pp. 40-57, which is incorporated herein by reference." Record 107 (emphasis added).

ASSIGNMENT OF ERROR (THE TRIBES)

Intervenor-petitioner The Confederated Tribes of the Coos, Lower Umpqua & Siuslaw Indians (the Tribes) advance four sub-assignments of error, each essentially arguing that the county failed to properly apply CBEMP Policy 18, Protection of Historical, Cultural and Archaeological Sites.

CBEMP Policy 18 provides in relevant part that a development proposal involving a cultural, archeological or historical site shall include a site plan application showing all areas proposed for excavation, clearing, and construction, and submit that site plan to the Tribes for a 30-day review period.[22] The county must then conduct a review of the site plan and approve

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[22] CBEMP Policy 18 provides, in relevant part:

> "Local government shall provide protection to historical, cultural and archaeological sites and shall continue to refrain from widespread dissemination of site specific information about identified archaeological sites.
>
> "I. This strategy shall be implemented by requiring review of all development proposals involving a cultural, archaeological, or historical site to determine whether the project as proposed would protect the cultural, archaeological, and historical values of the site.
>
> "II. The development proposal, when submitted, shall include a Site Plan Application, showing, at a minimum, all areas proposed for excavation, clearing, and construction. Within three (3) working days of receipt of the development proposal, the local government shall notify [the Tribes] in writing, together with a copy of the Site Plan Application. [The Tribes] shall have the right to submit a written

or deny based in part on whether the Tribes and the applicant have agreed on "appropriate measures" to protect cultural, archeological or historical resources.[23]

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statement to the local government within thirty (30) days of receipt of such notification, stating whether the project as proposed would protect the cultural, historical, and archaeological values of the site or, if not, whether the project could be modified by appropriate measures to protect those values. [giving examples of appropriate measures]."

[23] CBEMP Policy 18 continues:

"III. Upon receipt of the statement by [the Tribes], or upon expiration of [the Tribes'] thirty day response period, the local government shall conduct an administrative review of the Site Plan Application and shall:

"a. Approve the development proposal if no adverse impacts have been identified, as long as consistent with other portions of this plan, or

"b. Approve the development proposal subject to appropriate measures agreed upon by the landowner and [the Tribes], as well as any additional measures deemed necessary by the local government to protect the cultural, historical, and archaeological values of the site. If the property owner and [the Tribes] cannot agree on the appropriate measures, then the governing body shall hold a quasi-judicial hearing to resolve the dispute. The hearing shall be a public hearing at which the governing body shall determine by preponderance of evidence whether the development project may be allowed to proceed, subject to any modifications deemed necessary by the governing body to protect the cultural, historical, and archaeological values of the site."

Initially, the county failed to provide notice and a 30-day comment period to the Tribes as required by CBEMP Policy 18(II). On December 18, 2015, the Tribes submitted an initial set of testimony that included information on archeological sites in the area, and noting that the Tribes had earlier designated the entirety of Jordan Cove as a site of archeological significance. The Tribes also took the position that the project would not protect the cultural and archeological values of the site, and objected that the applicant had not provided the site plan as required by CBEMP Policy18(II), which limited the Tribes' ability to provide focused objections. The county corrected its notice error and gave the Tribe 30 days to submit additional testimony, and the Tribes submitted a second set of testimony on January 12, 2016. However, the county did not initiate the administrative review process set out in CBEMP Policy 18(III), but instead apparently chose to consider the Tribes' testimony within the ongoing conditional use permit proceeding.

As noted, the county hearings officer held the only public hearing on December 18, 2015, and issued his recommendations on May 4, 2016. In his findings, later adopted by the commissioners, the hearings officer expressed skepticism about the Tribes' claim that the entirety of Jordan Cove has been designated as an archeological site, and criticized the Tribes for failing to provide site-specific objections and for failing to take a clear position on whether the proposal would protect the cultural, historical, and archaeological values of the site. With respect to the site plan required by CBEMP Policy

18(II), the hearings officer speculated that a plot plan found in the application was intended to be that site plan. Ultimately, however, the hearings officer made no findings of compliance with CBEMP Policy 18, but instead accepted JCEP's request to impose a condition of conditional use permit approval, deferring entirely consideration of CBEMP Policy 18 to a subsequent proceeding.[24] Accordingly, the county imposed Condition E.1., which provides, in its entirety:

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[24] Intervenor requested the following condition of approval:

> "Upon receipt of the statement from the Tribe(s) under CBEMP Policy 18.II, the County shall take one of the following actions: (1) if no adverse impacts to cultural, historical or archeological resources on the site have been identified, the County shall find that the Applications are consistent with CBEMP Policy 18; (2) if the Tribe(s) and the applicant reach agreement regarding the measures needed to protect the identified resources, the County shall find that the Applications are consistent with CBEMP Policy 18, subject to any additional measures the County believes are necessary to protect those resources; or (3) if the County finds that there will be adverse impacts to identified CBEMP Policy 18 resources on the site and the applicant and the Tribe(s) have not reached agreement regarding protection of such resources, then the Board of County Commissioners shall hold a quasi-judicial hearing to resolve the dispute. The hearing shall be a public hearing at which the governing body shall determine by [a] preponderance of the evidence whether the development project may be allowed to proceed, subject to any modifications deemed necessary by the governing body to protect the cultural, historical, and archeological values of the site. For purposes of this condition, the public hearing shall be subject to the provisions of [LDO 5.7.300] with the Board of Commissioners serving as the

> "The Board shall hold a quasi-judicial hearing to determine compliance with CBEMP Policy 18. The hearing shall be a public hearing at which the governing body shall determine by preponderance of the evidence whether the development project may be allowed to proceed, subject to any modifications deemed necessary by the governing body to protect the cultural, historical, and archaeological values of the site. For purposes of this condition, the public hearing shall be subject to the provisions of section 5.7.300 of the CCZLDO with the Board of Commissioners serving as the Hearings Body. The Board's decision in that matter shall constitute the Board's decision regarding the Applications' consistency with CBEMP Policy 18." Record 216.

A. Subassignments of Error A, C, and D

In these subassignments of error, the Tribes allege the county erred by deferring its CBEMP Policy 18 project review obligations by: (1) refusing to recognize and consider the Tribe's testimony regarding identified archaeological sites and districts within the project area and significant adverse impacts from the project; (2) approving the LNG Terminal without requiring the applicant to submit the site plan required by CBEMP Policy 18(II); and (3) deferring CBEMP Policy 18 determinations for an undetermined amount of time.

> Hearings Body. The Board's decision in that matter shall constitute the Board's decision regarding the Applications' consistency with CBEMP Policy 18." Record 126.

1. Deferral

Because subassignments of error A, C, and D rest upon the petitioners' challenge to the county's decision to defer its CBEMP Policy 18 obligations, we begin with that issue.

The Tribes contend that, as a matter of law, the county cannot defer the procedures and determination of compliance with CBEMP Policy 18. To the extent deferral of compliance with CBEMP Policy 18 is permissible in some cases, the Tribes argue that it is not permissible in the present case.

In response, JCEP cites *Rhyne v. Multnomah County*, 23 Or LUBA 442, 447-48 (1992), for the proposition that local governments are permitted to defer a determination of compliance with a permit approval standard until a second stage in the approval process, as long as the second stage approval process provides the same notice and hearing as the initial stage:

> "Where the evidence presented during the first stage approval proceedings raises questions concerning whether a particular approval criterion is satisfied, a local government essentially has three options potentially available. First, it may find that although the evidence is conflicting, the evidence nevertheless is sufficient to support a finding that the standard is satisfied or that feasible solutions to identified problems exist, and impose conditions if necessary. Second, if the local government determines there is insufficient evidence to determine the feasibility of compliance with the standard, it could on that basis deny the application. Third, if the local government determines that there is insufficient evidence to determine the feasibility of compliance with the standard, instead of finding the standard is not met, it may defer a determination concerning compliance with the standard to the second stage. In selecting this third option, the local government is not finding all applicable approval standards are complied with,

> or that it is feasible to do so, as part of the first stage approval (as it does under the first option described above). Therefore, the local government must assure that the second stage approval process to which the decision is making is deferred provides the statutorily required notice and hearing, even though the local code may not require such notice and hearing for second stage decisions in other circumstances. *Holland v. Lane County*, 16 Or LUBA 583, 596-97 (1998)." *Id.* (Footnotes omitted).

There are several problems with JCEP's reliance on *Rhyne*. First, *Rhyne* contemplates a multi-stage approval process, where consideration of criteria that apply at the first stage can be safely deferred to the second stage, if the requisite determinations and assurances are made, because no development is possible until the final, second stage approval is obtained. However, the permit applications in the present case do not involve a multi-stage approval process. The county has, in effect, created an *ad hoc* multi-stage conditional use permit approval process, where compliance with most standards are finally determined in the first stage, leaving only compliance with one standard (CBEMP Policy 18) to be resolved at a second stage solely devoted to that purpose. That *ad hoc* approach might be permissible in some cases, with respect to some kinds of approval standards, but it requires basic assurances that Condition E.1 lacks.

Notably, nothing in Condition E.1 requires that the second stage approval be obtained prior to development, or indeed provides any assurances that there will be a second stage approval process at all. Condition E.1 is silent regarding the timing and initiation of the second stage. JCEP's request suggested that the second stage process would be initiated only when the

Tribes submitted the statement described in CBEMP Policy 18(II). *See* n 23 ("Upon receipt of the statement from the Tribe(s) * * *."). But that is not consistent with CBEMP Policy 18, which contemplates that the CBEMP Policy 18 process is initiated by the applicant filing the development application with the required site plan. The Tribes took the position that JCEP has not yet submitted the required site plan to the county, and that its efforts to provide a response to the application were hampered by the lack of the site plan. In his findings, the hearings officer identified a "plot plan" that he believed was intended to represent the site plan required by CBEMP Policy 18(II), but that issue was never resolved. Absent an adequate condition of approval that specifies how and when the CBEMP Policy 18 review process will be initiated, there is no assurance that it will ever be initiated and completed prior to development.

In addition, as a predicate to the deferral option, *Rhyne* requires that the local government determine that there is insufficient evidence to determine compliance or the feasibility of compliance with the applicable standard. *See also Gould v. Deschutes County*, 227 Or App 601, 611-12, 206 P3d 1106 (2009) (to defer a finding of compliance with first stage approval criteria to a second stage approval process, the county must find that eventual compliance with the applicable approval standards is "feasible" in the sense that the county can rule out denial as the outcome required by the hearing record). The county made none of the determinations required by either *Rhyne* or *Gould*, but simply

stated that intervenor's request to defer consideration of Policy 18 "seemed reasonable." Record 126.

More fundamentally, we question whether CBEMP Policy 18 is the kind of approval standard that can be deferred. CBEMP Policy 18 is more than an approval standard, it also invokes a particular process. That process is explicitly linked to the initial development application. *See* ns 22 and 23 (requiring the county to notify the Tribes within three days of receiving the application, and providing 30 days for the Tribes to respond). CBEMP Policy 18 clearly contemplates that resolution of issues raised by the Tribes, which may change the scope, scale and footprint of the development proposal considerably, or even cause it to be denied outright, will be completed before the development is approved.

Moreover, it is important to note that CBEMP Policy 18 requires coordination with and the resolution of disputes raised by a *sovereign* government. Under CBEMP Policy 18, the Tribes are not merely another participant in the proceedings. The Tribes are entitled under CBEMP Policy 18 to special notification and consideration of issues raised, as well as the power to compel the applicant into negotiations to resolve those issues, and to compel county resolution of unsuccessfully negotiated issues. That power is considerably vitiated if the applicant can first obtain county approval of the proposed development, and only then sit down with the Tribes to negotiate changes to the approved development. Given the inertia of an existing

conditional use permit approval, the county is less likely in a deferred CBEMP Policy 18 proceeding to force the applicant to accept changes to a development proposal that the county has already considered and approved. It is even less likely in such a deferred proceeding that the county would take seriously arguments that the application cannot comply with CBEMP Policy 18 and must be (retroactively) denied.

The county's findings include no interpretation of CBEMP Policy 18 explaining why it believes compliance with the policy can be deferred to a second stage proceeding, other than deferral "seemed reasonable." Record 126. It is not clear to us if the question of whether compliance with CBEMP Policy 18 can be deferred to a second stage proceeding is a matter of local or state law. Even if it is purely a matter of local law, in the absence of an adequate local interpretation, for the reasons set out above we conclude under ORS 197.829(2) that the county erred in deferring compliance with CBEMP Policy 18 to a second stage proceeding.

B. Subassignment of Error B

In this subassignment of error, the Tribes argue the county erred to the extent it rejected the Tribes' claim that the entirety of Jordan Cove is a cultural and archeological site for purposes of CBEMP Policy 18. That claim is based

in part on the fact that in 2015 the Tribes designated Jordan Cove as a "significant" archaeological site under ORS 358.905(1)(b)(B).[25]

JCEP responds that the skepticism expressed in the hearings officer's findings that the entirety of Jordan Cove is a cultural or archeological site for purposes of CBEMP Policy 18 was merely nonbinding *dicta*, which would have no preclusive effect on any future proceeding to consider compliance with CBEMP Policy 18. We agree with JCEP that the challenged findings are *dicta*, given that the county completely deferred consideration of compliance with the policy to a second stage proceeding. As explained above, that deferral was erroneous, and remand is necessary for the county to conduct the proceedings required by CBEMP Policy 18, before approving the conditional use permit application. On remand, questions regarding the location and scope of archeological sites affected by the development remain issues to be resolved.

The first assignment of error (The Tribes) is sustained, in part.

FIRST ASSIGNMENT OF ERROR (ROGUE INTERVENORS)

As noted, the application proposes development in areas designated as coastal shorelands under Statewide Planning Goal 17. OAR chapter 660, division 037 implements Goal 17 and the state policy to generally limit development of coastal shorelands to uses that are "water-dependent." The

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[25] ORS 358.905(1)(b)(B) provides that a "Site of archaeological significance" means "Any archaeological site that has been determined significant in writing by an Indian tribe."

Goals define "water-dependent" to mean "[a] use or activity which can be carried out only on, in, or adjacent to water areas because the use requires access to the water body for water-borne transportation, recreation, energy production, or source of water." Statewide Planning Goals, Definitions 8.

OAR 660-037-0040(6) provides additional definitions for purposes of the rule, which the county has implemented verbatim in LDO 2.1.200. In relevant part, OAR 660-037-0040(6)(C) defines "water-borne transportation" to mean uses of water access that fit into one of three subcategories, uses which are themselves transportation, uses which "require the receipt of shipment of goods by water," or uses which are themselves not water-borne transportation, but that are "necessary to support water-borne transportation," with the example provided of "terminal and transfer facilities."[26]

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[26] OAR 660-037-0040(6) provides, in relevant part:

"Water-Dependent Use.

"(a) The definition of 'water-dependent' contained in the Statewide Planning Goals (OAR chapter 660, division 015) applies. In addition, the following definitions apply:

"(A) 'Access' means physical contact with or use of the water.

"(B) 'Requires' means the use either by its intrinsic nature (e.g., fishing, navigation, boat moorage) or at the current level of technology cannot exist without water access.

The county concluded that the components of the LNG facility located on coastal shorelands are "water-dependent uses" as defined at LDO 2.1.200

"(C) 'Water-borne transportation' means uses of water access:

"(i) Which are themselves transportation (e.g., navigation);

"(ii) *Which require the receipt of shipment of goods by water*; or

"(iii) Which are necessary to support water-borne transportation (e.g. moorage fueling, servicing of watercraft, ships, boats, etc.[, and] *terminal and transfer facilities*).

"* * * * *

"(b) Typical examples of water dependent uses include the following:

"(A) Industrial — e.g., manufacturing to include boat building and repair; water-borne transportation, *terminals, and support*; energy production which needs quantities of water to produce energy directly; water intake structures for facilities needing quantities of water for cooling, processing, or other integral functions.

"* * * * *

"(c) For purposes of this division, examples of uses that are not 'water dependent uses' include restaurants, hotels, motels, bed and breakfasts, residences, parking lots not associated with water-dependent uses, and boardwalks." (Emphasis added.)

and OAR 660-037-0040(6), because the facility involves "water-borne transportation" and is also a "terminal and support." Record 44.

On appeal, Rogue Intervenors argue that the county erred in concluding that the facility constitutes "water-borne transportation," to the extent it relied upon OAR 660-037-0040(6)(a)(C)(ii), for uses of water access "[w]hich require the receipt of shipment of goods by water[.]" Rogue Intervenors argue that "water-borne transportation" under subcategory (ii) is limited to uses related to the *import* of goods, and therefore does not include a facility dedicated to exporting LNG.

JCEP responds that Rogue Intervenors do not challenge the county's alternative conclusion that the facility is a "terminal," and therefore an express example of a water-dependent industrial use. JCEP is correct. OAR 660-037-0040(6)(a)(C)(ii) is one of three separate subcategories of uses of water access that concern "water-borne transportation." The third, OAR 660-037-0040(6)(a)(C)(iii), expressly includes "terminals and transfer facilities." *See also* OAR 660-037-0040(6)(b) (citing "terminals" as a typical example of an industrial water-dependent use). Even if the OAR 660-037-0040(6)(a)(C)(ii) subcategory is limited to import facilities, as Rogue Intervenors argue, there can be no possible dispute that a facility that loads goods onto cargo ships is a "terminal" for purposes of OAR 660-037-0040(6)(a)(C)(iii) and thus properly viewed as "water-borne transportation" for purposes of the definition of "water-dependent use."

The first assignment of error (Rogue Intervenors) is denied.

SECOND ASSIGNMENT OF ERROR (ROGUE INTERVENORS)

The proposed LNG facility includes a 20-acre gas-processing facility, located on an industrially zoned portion of the site. The gas-processing facility first refines natural gas arriving by pipeline to remove water and carbon dioxide.[27] The refined gas is then sent through a multi-stage liquefaction process to cool and liquefy the gas. Record 18. The resulting product, LNG, is stored at a temperature of -260 degrees in large storage tanks and eventually transferred to LNG tankers via a cryogenic line. When the LNG reaches its ultimate destination, it is unloaded and converted back into gaseous form.

The industrial zone allows the processing of mineral resources as an allowed use. LDO 2.1.200 defines "Mineral Resources—Processing" as "[t]he act of refining, perfecting, or converting a natural mineral into a useful

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[27] The county's decision describes the refinement process:

> "* * * Once natural gas is transferred to the Applicant through the metering station, the gas would go through a processing plant. The processing facility would consist of two feed gas pre-treatment trains, each containing two systems in the series: a CO2 removal process which utilizes a primary amine to absorb CO2, followed by a dehydration system which uses two solid absorbents to remove water and mercury from the feed gas. The gas processing units would remove substances that would freeze during the liquefaction process, namely CO2 and water. Mercury would also be removed to prevent corrosion to downstream equipment. Trace amounts of hydrogen sulfide (H2S) would be removed as well. * * *" Record 22.

product." In this assignment of error, Rogue Intervenors argue that the county misconstrued LDO 2.1.200 in concluding that the gas-processing facility processes a mineral resource. According to Rogue Intervenors, the gas-processing facility does not convert natural gas into a "useful product," but instead takes natural gas that is of household quality, and converts it for transportation purposes only into LNG, which is not itself a "useful product." Rogue Intervenors argue that, as a matter of law, transforming a useful product into a non-useful product for transportation does not fit within the definition of "Mineral Resources—Processing" at LDO 2.1.200.

The county board of commissioners rejected that argument below:

> "* * * In its gaseous form, natural gas on the mainland of the U.S. is not a useful product for consumers living in Hawaii, for example, because there is no way to get it to that market in an unrefined form. The natural gas is refined and then converted into a liquid form so that it may be transported and used as a 'useful product' throughout the Pacific Rim." Record 141.

The county concluded that "[i]f a mineral needs to be further processed or 'perfected' to make transportation economically viable, then it follows that further processing is required to make the mineral a 'useful product' for the intended market." *Id.*

JCEP argues, and we agree, that the commissioners' interpretation of LDO 2.1.200—that processing a natural mineral into a form that allows it to be transported to markets renders that natural mineral a "useful product" for that purpose—is consistent with the express language of LDO 2.1.200's definition

and accordingly must be affirmed. That the natural gas arriving at the gas-processing facility is of "household quality" and is already one form of useful product does not mean that it cannot be further processed into a different, but still useful, product, even if the usefulness of that product is to allow transportation to markets where the product will be processed further to return it to a gaseous and more useful form.

The second assignment of error (Rogue Intervenors) is denied.

FOURTH ASSIGNMENT OF ERROR (ROGUE INTERVENORS)

Rogue Intervenors argue that the county erred in failing to impose a condition making the conditional use permit approval effective only when and if JCEP obtains all required state and federal approvals for the proposed LNG terminal, including FERC approval. In addition, Rogue Intervenors note that the gas processing facility will require a new electrical power plant, for which JCEP has not yet filed applications. Rogue Intervenors argue that the county should have made its permit decision effective only when and if the county approves the application for the new power plant.

The county's decision requires JCEP to obtain all required state and federal permits (which are required in any event by state and federal law), but does not delay the effective date of the conditional use permit approval until all required permits and approvals are obtained. JCEP responds, and we agree, that Rogue Intervenors have not identified any law that requires the county to impose a condition delaying the effectiveness of its permit approval until all

other permits and approvals have been obtained. Absent a more developed argument, Rogue Intervenors' fourth assignment of error provides no basis for reversal or remand.

The fourth assignment of error (Rogue Intervenors) is denied.

FIRST ASSIGNMENT OF ERROR (CLARKE)

The proposed gas processing facility includes two "amine contactor" towers, or thermal oxidizers, that will vent heated gas into the atmosphere. The facility is located across the estuary from the Southwest Oregon Regional Airport. A portion of the LNG terminal site is within the approach surface of Runway 13, but as proposed the gas processing facility is not within the approach surface or the associated flight path.

In three sub-assignments of error, intervenor-petitioner John Clarke (Clarke) challenges the county's findings regarding compliance with LDO 4.11.445(4), which provides:

> "Industrial Emissions. No new industrial, mining or similar use * * * shall, as part of its regular operation, cause emissions of * * * steam that could obscure visibility within airport approach surfaces, except upon demonstration, supported by substantial evidence, that mitigation measures imposed as approval conditions will reduce the potential for safety risk or incompatibility with airport operations to an insignificant level. The review authority shall impose such conditions as necessary to ensure that the use does not obscure visibility."

JCEP submitted a "thermal plume" study to demonstrate compliance with LDO 4.11.445(4). The study evaluated the plumes generated by the gas processing facility, as well as the electrical power plant that is not part of this

application. According to the study, the thermal oxidizers will generate only four percent of the heat plumes from both sources, and the plumes from all sources will meet applicable aviation standards. Clarke objected during the proceedings below that the thermal oxidizers will produce steam, which will obscure visibility within the airport approach surface, stating that "[b]asic physics tell you that heated air released into cool, damp air will produce steam." Record 7158. JCEP responded with a letter from Himes, a registered engineer with 46 years of experience including 10 years designing LNG facilities, who testified in relevant part that "[t]here are no visible or steam plumes from the facility." Record 3757. The county found that Himes' testimony constitutes substantial evidence and is more credible than any evidence to the contrary. Record 172.

Clarke argues that (1) Himes' statement that the thermal oxidizers will not produce visible steam plumes is not substantial evidence, given the "common knowledge" that heated air released into a cool atmosphere will produce steam; (2) although the gas processing facility is proposed to be located outside of Runway 13's surface approach area, the applicant did not seek, and the county did not approve, site plan approval, and it is possible that the gas processing facility could be moved to a location within the surface approach area; and (3) the county failed to adopt any "mitigation measures" to ensure that steam plumes will not obscure visibility within the airport surface approach area.

JCEP responds, and we agree, that Clarke's arguments do not provide a basis for reversal or remand. Himes' expert testimony is substantial evidence that the thermal oxidizers will not produce visible plumes of steam, and that testimony is not undermined by Clarke's statement, based on "common knowledge," that heated air released into cool air produces steam. In any case, LDO 4.11.445(4) is concerned only with obscured visibility within the surface approach area. Clarke's speculation that the gas processing facility could be moved from its proposed and approved location into the surface approach area is just that—speculation. JCEP proposed a specific location for the gas processing facility, and justified that facility's compliance with LDO 4.11.445(4) based in part on that proposed location, outside the surface approach area. Clarke does not explain how the gas processing facility could be relocated from that approved location west to a site within the surface approach area without modifying the conditional use permit or otherwise triggering evaluation under LDO 4.11.445(4)

The first assignment of error (Clarke) is denied.

The county's decision is remanded.