



Plastics Recovery Assessment Advisory Workgroup

Meeting #2 Notes: May 8, 2014, 1:30 pm to 4:30 pm

Oregon Department of Environmental Quality

Workgroup attendees:

Elizabeth Bedard, APR (by phone)
Dennis Denton, Denton Plastics
Kevin DeWhitt, Agilyx (by phone)
Nicole Janssen, Denton Plastics
Laura Leebrick, ORRA
David Michaud, Tomra
Patty Moore, Moore Recycling
Megan Ponder, City of Portland
Mark Saelens, Lincoln County

Tim Shestek, American Chemistry Council
Vinod Singh, Far West Fibers
Matt Stern, Waste Management (by phone)
Matt Tracy, Metro

Peter Spendelow, DEQ (agency lead)
Christy Nobel, DEQ (notetaker)
Tim Buwalda, Reclay StewardEdge (contractor)
Christy Shelton, Cascadia (contractor)

Other attendees, in person and by phone

Contracia Adams (phone)	Dean Kampfer	Susan Robinson
Mike Biddle (phone)	Andrew Kenefink (phone)	Tracy Sagal
Nancy Carr (phone)	Shawna Lamoree	Larry Stephens
Dylan deThomas (phone)	Cynthia Moore	
Justin Gast	Jeff Murray	

Welcome and Introductions

Following some technical problems with the conference call, the meeting convened at approximately 1:45 p.m. with introductions of the participants at DEQ and on the phone.

Peter Spendelow of DEQ provided a brief overview of outcomes from the previous Plastics Recovery Assessment Advisory Workgroup meeting in May 2013 and work on the project to date. The Workgroup met before selection of a contractor to develop the scope of the project, determine sources of data, and determine what organizations might contribute to the project. Peter explained the project scope and schedule of the selected contractor, Reclay StewardEdge (with Cascadia Consulting Group as a subcontractor). The consultant will provide draft materials for Workgroup review prior to the next meeting, which is slated to occur in June. The final meeting will likely take place in late July and the final report is slated to wrap up in late summer.

Project Background, Goals, and Objectives

Tim Buwalda of Reclay StewardEdge explained the project's objectives as well as specific goals for this meeting. He also provided an overview of the meeting's agenda. The project is intended to identify practical opportunities for increasing plastic recovered from Oregon's waste stream for useful purposes, saving resources, energy, and emissions. The contractor will quantify plastics disposal and recycling;

assess markets; evaluate sorting technology; assess infrastructure; analyze options to increase plastic recovery; assess the lifecycle impact of potential options; and participate in meetings of the Workgroup, including preparation of working papers and reports.

To support recommendations to guide state policy for plastics recovery, the Workgroup will consider quantities of materials disposed and recycled; feasibility of collecting, sorting, and processing; technology; markets; scenarios; and policy options. The project seeks feedback from the Workgroup regarding the following topics:

- Plastic types with practical potential for increased recycling and recovery.
- Categories of plastic for which more detailed info should be developed.
- Collection and processing systems for which more detailed info should be developed.
- Potential scenarios under which increased recycling and recovery could occur.
- State policy approaches to support increased recycling and recovery.

Existing Initiatives

Peter described how the work of the Plastics Recovery Assessment Advisory Workgroup is linked to DEQ's *Materials Management 2050 Vision*. Materials management involves considering the impact of materials over their entire lifecycle, beyond end-of-life management. The *Materials Management Vision and Framework for Action* is Oregon's solid waste management plan. A broader Materials Management Workgroup is supporting and advising these ongoing efforts.

The Materials Management Workgroup includes three subgroups: Sustainable Funding, Goals and Measures, and Recycling Opportunities. DEQ is preparing proposed legislation for 2015 in these topic areas. The Goals and Measures subgroup is helping to set material-specific goals for plastics, food waste, and carpet. In light of the expansion of Oregon's bottle bill to include juices, teas, and other beverages, DEQ seeks the input of the Plastics Workgroup to help determine which additional plastics should be included in the statewide goals. What goals should be set?

Group discussion/questions

Is WM Agilyx taking plastics from construction? Does WM Agilyx charge a fee?

Peter reported that the Waste Management Agilyx Wastech facility obtains most of its material from Waste Management's own sources, including plastic separated from other wastes by Waste Management from construction and other "dry" wastes. Waste Management charges a tip fee for waste materials delivered to it. We do not know if they would pay for plastics that had been processed to a form that could be directly introduced into the WM Agilyx facility.

Should state policy action consider requiring the processing of certain waste streams prior to disposal to recover plastics and other non-recycled materials?

Yes, but markets need to be able to support recovery of these materials. Additional efforts may be needed for problematic materials, as reasons exist for why they are not currently recovered. Enforcement is also needed.

Overview of Plastics Quantities

Christy Shelton of Cascadia Consulting Group provided an overview of plastics generation, recycling, recycling rates, and disposal, to support the Workgroup's efforts in identifying practical potential for increased recovery. She summarized the data sources, data limitations, and methods used. Key data sources include multiple studies published by DEQ as well as studies from California (statewide), Los Angeles, New York City, Ontario (Canada), Vermont, Washington, Wisconsin, U.S. Census Bureau, and Bureau of Labor Statistics. The analysis also examined residential and commercial quantities, as well as estimates of quantities generated from various commercial sectors.

Plastic recycling quantities for rigid plastic containers, plastic film, and other plastic have increased since 2007, particularly with the expansion of Oregon's bottle bill.

Despite the growth in plastic recycling, plastic recycling rates remain low in comparison with other recycling categories in the state: 35 percent for rigid plastic containers, 16 percent for plastic film, and 13 percent for other plastic—and 21 percent combined; meanwhile, the state's overall recycling rate is approximately 50 percent. More than 200,000 tons of plastic are disposed annually in Oregon. Christy also provided a table showing plastic disposal by plastic type and generator category: single-family residential, multifamily residential, commercial, drop box, and self-haul. Plastics represent approximately 10 percent of Oregon's annual disposal of more than 2 million tons of waste.

The analysis also used data from other studies with more detailed categories for plastics disposal—including Vermont, New York City, and California—and applied them to Oregon, to identify potential opportunity areas for increasing plastic recovery. The analysis examined plastic generation from different commercial sectors, including agriculture/fisheries, educational services, financial services, food stores, government facilities, accommodation, information, manufacturing, medical services, other miscellaneous services, professional services, recreation, restaurants, retail trade, transportation and warehousing, and wholesale trade. Plastic film, in particular, showed relatively high generation levels across almost all sectors.

Group discussion/questions

Which portion of materials can go to recycling? What are the available markets? How are we doing with materials that are already targeted for collection?

Tim noted that Wisconsin has conducted a similar effort. Many materials that are already targeted continue to show up in the waste stream, which also occurs in Oregon. Strategies need to optimize current investments and infrastructure as well as seek opportunities for expanding curbside recycling and commercial recycling opportunities, including plastic film and packaging. Current efforts should be examined to see what is working well.

Which sectors should we focus on?

The group discussed commercial, government, schools, hotels, and residential curbside. Some participants recommended excluding residential, while others supported its inclusion. Peter noted that none of the residential curbside recycling programs in Oregon currently targets plastic film in their

single-stream curbside programs because the equipment used to process residential single-stream materials is not compatible with film plastics.

What opportunities exist for increasing plastic film recycling?

For the industrial, commercial, and institutional categories (ICI), the group discussed collecting film separately or with old corrugated containers (OCC), as film and cardboard are often generated together. Patty Moore of Moore Recycling offered a number of specific recommendations:

- Small generators can piggyback with larger generators, such as smaller stores bringing their recyclables to an anchor store at a mall for pick-up (such strategies are time-consuming but effective).
- Involving distributors that supply the products and packaging that generate plastics waste, including seeking backhauling opportunities, may be valuable.
- Drop-off film collection may need renewed attention in light of changes following China's Green Fence policy implementation; the material needs to be marketable to support viable collection, and inclusion of heavier, multilayer materials can be problematic to sell to markets.
- Encouraging film producers and manufacturers to use recycled content can help close the loop and strengthen recycling markets.

Recycling Markets

Tim provided an overview of markets for both recycling and recovery of plastics. **Recycling** means the plastic remain will remain in the same form to be used again as a plastic, though it may be ground, cleaned, remelted, and otherwise processed. **Recovery** means plastic that is converted into energy, such as through pyrolysis, gasification, or combustion.

The **recycling** overview covered materials recovery facilities (MRFs), handlers, and sorting of municipal solid waste (MSW); brokers and exporters; plastics recovery facilities (PRFs); processors and merchant reclaimers; and product manufacturers. Tim described plastic resin types and market grades. Regional markets include Agri-Plas, Denton Plastics, Northwest Polymers, ORPET, Epic Plastics, Merlin, Peninsula, and Trex.

Much of the plastic collected in the United States goes overseas. The primary export markets are in Asia, though materials that used to go straight to China now often travel to countries like Vietnam or Malaysia for additional sorting/clean-up prior to shipment to China. The presentation also covered emerging recycling markets in North America for PET thermoforms, prepicked #3-7 mixed rigids, polypropylene, tubs and lids, polystyrene, expanded polystyrene, and PLA. More markets are located in the Eastern United States, closer to major sources of material generation in large population centers. Increased sorting improves the marketability and price for the material, though of course, sorting involves time and money.

For **recovery** markets, one pyrolysis facility exists in Oregon (Agilyx). Otherwise, options are extremely limited on the West Coast. More recovery facilities exist in the eastern United States, though pyrolysis and gasification are still in their inception. Some eastern U.S. markets exist for energy recovery from plastics through engineered fuels (e.g., pellets) and industrial facilities (e.g., cement kilns).

Group discussion/questions

Do PRFs pay for prepicked plastics?

Yes; not a lot, but the material has a positive value. PRFs compete with export markets (e.g., China, Viet Nam), particularly on the West Coast. Oregon likely does not have enough materials alone to support a PRF; it would need to draw from regional sources, such as including Washington, northern California, and British Columbia. A regional scale facility can process on the order of 100 million pounds of plastic annually (50,000 tons) and require a \$20+ million investment to develop.

Oregon markets

Dennis Denton of Denton Plastics noted that some of the sorting data need to be updated. He reported that Denton Plastics sorts bulky rigids such as crates, buckets, and roll-carts (toters). He stated that Denton focuses on accepting about 90 percent of the materials available and lets the other 10 percent go elsewhere for energy recovery (e.g., Agilyx). Denton does not want glass, engineered resins, electronics, or polystyrene, though they will accept them. Vinod Singh reported that Far West Fibers also sorts mixed bales, but the materials that are left behind are often “oddballs” that are difficult to market.

Sorting Technologies

Tim provided an overview of sorting technologies to separate plastic from other materials, including MSW processing, wet/dry processing, single-stream technologies, and dismantling or shredding of durable and composite products that contain plastic, such as electronics. He also briefly reviewed plastic sorting technologies at the MRF level, including technologies, limitations, and cost considerations. No MRFs in Oregon currently use optical sorters, which is different than in other states. He also presented more information regarding dedicated plastics recovery facilities (PRFs). Existing PRFs are largely located in the eastern United States, except for one that is underway in Los Angeles.

Group discussion/questions

Why are optical sorters not in use in Oregon?

It was noted that many of the MRFs in California have them. Tim explained that it relates to the timing of facility upgrades (recapitalization) and their cost. A base-level optical sorter may cost \$100,000 off the shelf, but installation in a MRF often results in costs of \$600,000 or more, because of everything else that must be done to install it, including electrical upgrades, moving walls, conveyors, bunkers, air compressors, blowers, and the like. Retrofitting a facility for optical sorters typically involves significant redesign and relocation of equipment and infrastructure; sorters cannot just be easily attached to an existing sort line. Matt Stern of Waste Management reported that optical sorters typically cost about \$1 million installed. Because of this capital expense, optical sorters need a minimum throughput to be cost-effective.

Plastics Recovery Facilities (PRFs)

Could a PRF help meet recycling goals for “other” plastics and address contamination issues with film from depots? How could such a facility be supported? The group discussed one-time investments, the state role, subsidies (such as from bottle bill proceeds or tip fee surcharges), and target materials. Could

regional MRFs establish a regional PRF as a joint venture? To develop a PRF, a large, reliable flow of materials would need to be assured over time; Oregon alone will not generate sufficient volume. PRFs are large, regional assets. In California, the bottle redemption value helps support plastics recycling efforts there through subsidies.

The group also discussed recycling of bioplastics (PLA). Overall, the quantities are very small, so it is difficult to sort cost-effectively.

Local sorting and export markets

MRFs in the region cannot be expected to sort more much than they do currently without improved economic incentives. The Port of Portland has a container export terminal and ships from that terminal go to one port in China, one in Korea, and a couple of ports in Japan. Because of the limited places to ship to out of Portland's terminal, much of the plastics that is exported is trucked to Seattle and Tacoma and shipped out of those ports.

Should there be a recycling goal for plastics? For what materials should the goals apply?

Peter noted that the goals would not be wasteshed-specific. The group discussed expected impacts of the upcoming bottle bill expansion. If the deposit increases to 10 cents per bottle, which appears likely, the redemption rate could rise to 80 percent. The Oregon Beverage Recycling Cooperative (OBRC) is working to establish redemption centers as part of the system transition to covering all beverage containers except for milk, wine, and liquor.

Should other plastics in addition to rigid plastic containers and beverage containers have recycling goals?

Each type of plastic needs to be considered separately, including how it moves through the system. Processing more materials locally, rather than put them on a ship, can reduce environmental impacts, including the carbon footprint. Local sorting also supports local economies and jobs.

What should be the role of the state in plastics market development?

Support sorting capacity. Support existing MRFs working together for a joint venture to sort plastics. Could the state contribute to start-up costs for a PRF? Could the state help guarantee the flow of materials to a PRF? Peter mentioned that there may be opportunities to work with state economic development staff as well.

Preparation for Next Meeting

Workgroup participants identified the following topics of interest for future research:

- Durable plastics recycling domestically.
- Barriers to effective collection with the materials that we are currently collecting, both residential and commercial.
- Multifamily recycling access and convenience.
- Public area recycling.

Vision for Plastics Recycling

At the conclusion of the meeting, Workgroup participants were asked to share their visions for the future of plastics recycling and recovery in Oregon. Responses are listed below:

- Make our best efforts to recycle everything we have. Later ban the rest (what's not getting recycled).
- Develop markets and end users for everything being generated. Residential focus would be best.
- Increased opportunities for recycling.
- Comprehensive curbside collection for materials that make sense, along with retail and other drop-off locations for the rest. Maximize commercial recycling. Strong design-for-recycling guidelines enforced and followed. Infrastructure for sorting and reclamation. Plastic-to-oil conversion where appropriate, such as multi-layer materials and pouches. Get aggressive with recycling.
- Energy recovery options for difficult-to-recycle materials.
- Send all materials to their highest and best use.
- Change wasteful packaging upstream through education and legislation. (Consider what's needed to protect the product vs. what is excessive and primarily for marketing purposes.)

The meeting adjourned at approximately 4:30 p.m.