

DOMESTIC PROCESSING OF MIXED PLASTICS: Meeting Summary

Background and Goals

Catalyzed by increasing concern about responsible recycling of mixed plastics and China's National Sword ban, Seattle Public Utilities (SPU) and King County Solid Waste Division facilitated an invitation-only meeting exploring the immediate and longer-term capabilities for increased sorting and processing of #3 – 7 and other mixed plastics domestically. Influential representatives from the recycling industry, government agencies, the Closed Loop Fund, and Zero Waste Washington were invited to join the conversation.

The goals of the event were:

- To bring together key recycling and solid waste management to take a serious look at the potential for sorting and processing #3 – 7 plastics domestically (including within British Columbia).
- To gain an understanding of efforts that can be enacted immediately in support of further domestic processing.
- To determine what conditions are needed to provide additional support and/or infrastructure for domestic sorting and processing.
- To gain clarity on whether existing Plastic Recovery Facilities (PRFs) can handle and sort increased volumes; if existing Material Recovery Facilities (MRFs) can handle increased capacity, or if new facilities are needed in the region.

The meeting was held on January 30, 2018 at the Seattle Municipal Tower.

Approach

SPU and King County worked with attendees and speakers to design an informative, thought-provoking, and interactive event that would stretch participants' thinking and encourage candid conversation and collaboration across industries and competitors.

The day's agenda (Appendix A) included:

- Opening remarks from SPU and King County Solid Waste Division.
- Contextual presentations from the Washington Department of Ecology and Zero Waste Washington.
- Panel discussion and Q&A with representatives from local and regional material recovery facilities, including Waste Management, Recology, Republic Services, Pioneer Recycling Services and British Columbia's Emterra Group.
- Presentations from the presidents of Merlin Plastics (PRF), Denton Plastics (plastics recycler) and Titus MRF Services (secondary MRF).
- A presentation by the Closed Loop Fund on developmental assistance for building domestic infrastructure.

- A small group exercise and subsequent group discussion to identify key players, barriers, opportunities and next steps.

Welcome and Opening Remarks from Seattle Public Utilities and King County Solid Waste

To begin the day, opening remarks were made by Ken Snipes, CEO and Deputy Director, Solid Waste Line of Business at Seattle Public Utilities, and Pat McLaughlin, Director of King County Solid Waste.

Ken Snipes began by thanking the room for their participation with a specific call out to those who traveled from across the West Coast to join the conversation. Next, he described the collaborative approach that King County and SPU are taking to find a solution for #3 – 7 plastics and the particular importance of the day’s conversation in the wake of China’s recent restriction on imported plastics. SPU’s approach, which aims to solve the problem at its source, includes:

- Eliminating unnecessary use of plastics
- Identifying what can be done regionally in order to sort and process #3 – 7 and other mixed plastics closer to home

Snipes urged the room to work toward a solution that utilizes expertise from both the public and private sectors and to consider options outside of simply exporting to alternative markets in Southeast Asia. This tactic, Snipes explains, would simply shift the negative social, human and environmental health impacts elsewhere. Instead, Snipes offers SPU’s commitment and support in finding the means to process these materials domestically and responsibly.

Next up, Pat McLaughlin spoke, sharing his excitement in having individuals from all sectors explore a solution together and reiterating the urgency of the day’s topic. McLaughlin described King County Solid Waste Division’s belief that a real solution is attainable if existing recycling resources come together to solve the issue.

McLaughlin acknowledged the meeting as a pioneering effort to develop a solution in our own backyard and asked the room to think outside the box to consider solutions that may challenge the norm or redefine recycling as we know it today. Lastly, McLaughlin shared his hope in developing real targets, keeping progress towards these goals visible, asking help of one another, and maintaining momentum around the topic that will hold all sectors accountable for their progress.

Context

The Current Landscape of #3 – 7 and Other Mixed Plastics in Washington State

Alli Kingfisher – Materials Management and Sustainability Specialist, Washington Department of Ecology

Alli Kingfisher, Materials Management and Sustainability Specialist at the Washington Department of Ecology, kicked off the day’s presentations with an overview of the current landscape of #3 – 7 plastics in Washington State and background on the state’s recycling habits.

Washington State has historically set ambitious recycling goals—achieving a 50 percent recycling rate in 2011. In the wake of China’s National Sword initiative—which restricts 24 varieties of solid waste and

recyclables, #3 – 7 plastics, unsorted mixed paper, textiles, some glass, and metals—a number of recycling programs and commodities across the state are feeling the impact.

Kingfisher began with a list of plastics related issues that have risen to the forefront since the National Sword ban. Those issues include:

- Upholding state recycling goals
- Local governments who are looking at stopping collection of materials that are problematic
- Stockpiling of materials occurring at facilities across the state
- Real recycling and ensuring the plastics being sorted are put to use
- Citizen interest – upholding promise to the public that the blue bin materials are being recycled and reintroduced into the loop
- Interest from elected officials –House Bill 2914, which looks to address contamination and determine commercial potential for processing and utilizing recyclables within the state

#3 – 7 plastics are just a portion of plastics collected and includes a variety of materials from bulky rigid plastics to plastic bags and film. #1 – 2 plastics, on the other hand, include bottles, tubs, and jugs. Kingfisher notes that communication to the public surrounding which of these materials are permitted in the blue bin differs across counties, despite the fact that commingled, single stream recycling programs are utilized throughout much of the state.

Since before 2010, the Washington Department of Ecology has been aware of contamination issues related to the commingled recycling system and has been working with a wide range of stakeholders, including collection companies, MRFs, processors, and local governments to seek improvement in the system. Key findings were released in the form of two reports focused on Southwest Washington and Northwest Washington. In general, findings pointed to the need to reduce contamination, increase material and messaging harmonization, and generate high-quality materials that support real recycling.

From the reports, Ecology identified the following key areas as needing action:

- Recycling of plastic bags and films in commingled programs are creating problems
- Caps on vs. caps off
- Determining acceptable recyclable plastics
- Packaging design
- Messaging, labeling and terminology that makes it easier for consumers to understand what is and is not recyclable
- Compostable and degradable plastics
- Development of a Northwest plastics recycling facility (PRF)

Next, Kingfisher broke down data surrounding plastics recycling and disposal in Washington. Table 1 provides the amounts and types of plastics recycled between 2010 and 2014. During this period, plastics as a whole made up 6.3 percent of all Municipal Solid Waste (MSW). Of that 6.3 percent, only 1.8 percent was recycled. Figure 1 shows the same numbers as an overall trend, with #1 – 2 plastics and #3 – 7 plastics broken out by amount recycled and amount disposed. As depicted, there is a large amount of #3 – 7 plastics being disposed of.

TABLE 1. PLASTICS RECYCLING AND DISPOSAL IN WASHINGTON (TONS)

| | 2010 | 2011 | 2012 | 2013 | 2014 |
|------------------------------|---------|---------|---------|---------|---------|
| 3-7 Plastics Recycled | 29,782 | 45,218 | 41,741 | 43,759 | 36,220 |
| 1-2 Plastics Recycled | 34,628 | 29,462 | 35,694 | 36,195 | 36,105 |
| 3-7 Plastics Disposed | 496,877 | 478,258 | 480,338 | 490,001 | 402,533 |
| 1-2 Plastics Disposed | 61,901 | 59,581 | 59,840 | 61,044 | 65,851 |

FIGURE 1. PLASTICS RECYCLING AND DISPOSAL IN WASHINGTON (TONS)

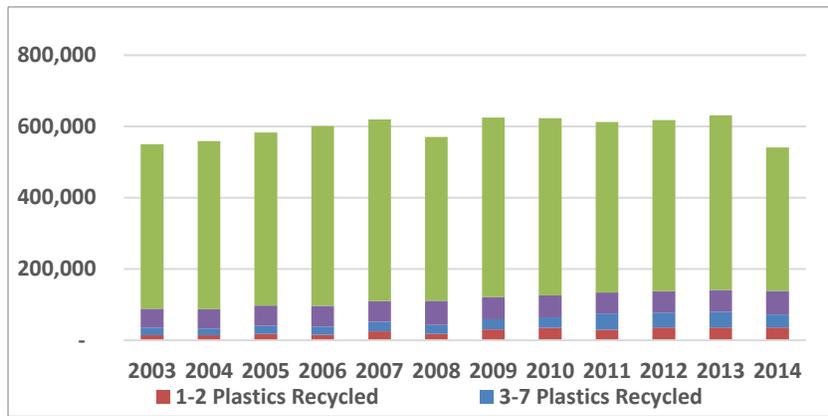


Table 2 below shows a snapshot of Seattle’s recycling stream. In 2015, plastics made up 5 percent of Seattle’s recycling stream, with #3 – 7 plastics making up 1.6 percent, or 1,431 tons. By contrast, contaminated materials made up about 10 percent of the stream.

TABLE 2. SEATTLE RECYCLING STREAM (TONS) 2015

| Plastic | Tons | Percentage |
|---|--------------|-------------|
| Plastic | 4,311 | 5.0% |
| Small PET Bottles (24 oz or smaller) | 620 | 0.7% |
| Large PET Bottles (greater than 24 oz) | 631 | 0.7% |
| PET Jars, Tubs, and Other Containers | 588 | 0.7% |
| HDPE Natural Bottles | 380 | 0.4% |
| HDPE Colored Bottles | 395 | 0.5% |
| HDPE Natural Jars, Tubs, and Other Containers | 129 | 0.1% |
| HDPE Colored Jars, Tubs, and Other Containers | 137 | 0.2% |
| Other Plastic Bottles (#3-7) | 120 | 0.1% |
| Other Jars, Tubs, and Containers (#3-7) | 251 | 0.3% |
| Plastic Bags and Packaging | 764 | 0.9% |
| Bulky Rigid Plastic | 296 | 0.3% |

To conclude, Kingfisher shared an overview of the differing ways that cities in Washington collect materials. Collection methods include:

- Cities that contract for MRF services directly with the MRF (Seattle and few other cities utilize this method).
- Cities that provide their own staffing and equipment for collection services.

- Cities that contract for collection services and allow the collection service provider to arrange for the sorting of collected materials.
- Cities and counties that operate within the Washington Utilities and Transportation Commission (WUTC) system, allowing local jurisdiction to set service levels, and identify materials for collection. The approved service provider in that area then arranges for the sorting and processing of collected materials.

The Importance of Domestic Processing to Citizens and NGOs

Heather Trim – Executive Director, Zero Waste Washington

Providing additional framing for the day’s discussion, Heather Trim, Executive Director of Zero Waste Washington, spoke on why finding a solution for plastics is increasingly important to both citizens and non-governmental organizations (NGOs). Trim suggests that Washington State’s general enthusiasm for recycling plays a role in citizen and NGO interest but mentions that, despite enthusiasm, consumers are often seen as needing the most improvement to their waste habits. This paradox leads Trim to ask whether social marketing strategies that leverage consumer feedback might help us to better understand how to improve consumer habits.

One of the emerging topics attracting public interest is the increased amount of plastics found in regional waters and the subsequent contamination to marine life. At present, Northwest marine water contains up to 9,200 plastic particles per cubic meter. These plastic particles, including anything from small microbeads to broken down pieces of larger rigid plastics, are being consumed by fish, birds, and other marine life. Of Northern Fulmar and Sooty Shearwater bird samples, between 50 – 90 percent were found to have plastics in their gut, dependent on region. Microplastics have also been found in mussels, leading many to question just how much plastic humans are really consuming and how this toxicity will impact public health.

Some of the policies that cities and municipalities are putting in place to minimize contamination include bans on plastic bags, Styrofoam, food service ware, and straws. To date, fourteen bag bans are in place in Washington with many more bans in consideration, and the movement to restrict use of plastic straws is gaining momentum, as demonstrated by the Strawless in Seattle campaign.

Driven by plastic pollution concerns, many NGOs such as the Plastics Pollution Coalition, Up Stream, 5 Gyres Institute, Rethink Plastics, and the Ellen MacArthur Foundation’s New Plastics Economy Initiative are rallying to come up with additional solutions. Some of the work these NGOs are conducting include data collection to track the amount of plastics coming in from fresh water and litter assessments to identify new types of plastic packaging, such as vape and cannabis tubes, now being found in litter.

With resident’s and NGO’s increasing awareness and investment in improving recycling habits and minimizing waste, Trim notes the unique opportunity for leadership to emerge that channels public awareness toward change. Trim identified the leadership opportunities listed below:

- Maintaining public expectation that materials are being recycled and reintroduced into commerce and new products.
- Providing incentives to increase domestic sorting and processing.

- Developing product stewardship programs to ensure high environmental compliance.

Panel Discussion: Material Recovery Facilities

Overview of Current Sorting and Recycling Practices

The first panel of the day included representatives from material recovery facilities who were asked to speak on current practices before opening up the conversation to Q&A. Panel members included:

- *Matt Stern – Director of Northwest Recycling Operations, Waste Management*
- *Todd Burnstein – Account Manager, Recology*
- *Don Zimmerman – Operations Manager, Republic Services*
- *Dave Claugus – VP, Pioneer Recycling Services*
- *Paulina Leung – VP of Corporate Strategy and Development, Emterra Group*

Panelists were asked to come prepared to discuss a list of questions, which are in Appendix B.

In general, current practices conducted at the US recovery facilities were widely the same with a few notable differences. An overview of each facility's practices are listed below:

Waste Management:

- Sorts to and bales #3 – 7 plastics, and film and rigid plastics
- Utilizes brokers to market bales to countries other than China (due to ban)
- Utilizes manual and mechanical sorting
- Mechanical sorting includes machinery that separates 2D materials from 3D materials
- Has slowed down the line and added additional employees to help combat contamination and improve quality standards, but notes that bale brakes are still inconsistent

Recology:

- Has a centralized sales group that handles recycling all over the West Coast
- Tries to sell bales to markets where they can get value for their product while also ensuring that the materials will be recycled
- Utilizes optical sorters and manual sorting to separate #1 – 2 and #3 – 7
- Hand sorts #2
- Utilizes an optical sorter to sort to #3 – 7

Republic Services:

- Handles a majority of plastics for the City of Seattle
- Includes #1 – 2, and #3 – 7 all in one bale
- Utilizes an optical sorter to separate materials and sorts further by hand
- Utilizes a broker to market bales across the West Coast
- Sorts film but notes the increased manual power needed to do so

Pioneer Recycling Services:

- Operates two MRFs in Tacoma and Portland
- Sorts to mixed rigid #3 – 7 plastics
- Previously included film but has not found an effective end market so is currently landfilling

- Utilizes a combination of optical, mechanical and hand sorting
- Currently generates and sends approximately three tons of #3 – 7 materials to Vietnam
- Collects 125 tons of rigid plastics a month which is then sold to secondary processors in Indonesia
- Focuses on clean paper products since this has the most promising end market – 50 percent of their stream is paper
- In support of having a secondary MRF or PRF that services the Pacific Northwest region

Key Barriers

There was also consistency in key barriers identified by US panel members. Those barriers included:

- Inclination to develop end markets based on types of plastics being collected rather than deciding what to recycle based on end market actual needs.
- The packaging industry's rapid shift toward flexible packaging is challenging to keep up with.
- Commingled recycling creates a stream that is difficult to sort and leads to increased contamination.
- A few MRFs noted that they would like to further sort #3 – 7 plastics but don't have the space or equipment to do so. Furthermore, there are not currently enough end markets for these types of plastics to justify the funds needed to purchase additional space and machinery.
- Film is challenging to sort, often times holding up the process, and has little value in end markets.
- Uncertainty that end markets are actually processing materials and lack of funds to investigate whether they are or not.
- Frequency of high grade materials like aluminum being found in bale breaks.
- Unavailability of a process, either mechanical, optical or human, that is able to perfectly sort materials.
- Plastics in the commingled stream make it difficult to meet increasing quality standards for marketing paper.

Differences and Similarities between the US and British Columbia

Following statements from US MRF representatives, Paulina Leung, VP of Corporate Strategy and Development at the Emterra Group, a British Columbia based collecting, processing, and marketing company, noted some of the similarities and differences between current practices in the US and British Columbia.

Similarities:

- American and Canadian citizens recycle the same way.
- American and Canadian citizens purchase the same types of products in similar packaging.
- Similar to America, end markets ultimately dictate what is and is not recyclable.

Differences:

- Canada has a different policy and infrastructure that incentivizes recovery goals and leads to a performance driven outcome.
- Canada has an Extended Producer Responsibility (EPR) program that holds producers accountable for a material's end of life and downstream recoverability.

- This means that Emterra cannot sell their materials to Vietnam, Indonesia or any other country where they don't know for certain that materials are being properly processed and made into recycled feedstock for new products or packaging.
- Paulina credits Canada's EPR program as the foundation that has created the commercial, environmental, and social framework that enables Canadian processing facilities to maintain high recovery rates for #3 – 7 plastics.

MRF Panel Q&A

A short Q&A session followed MRF panel statements. Questions and answers from this portion of the panel are summarized below:

Q: *Is there a significant difference between the types of plastics that are collected from residents and the types collected from commercial businesses?*

A: *Plastics from residential are often bottles and containers, whereas commercial collection typically includes more rigid #3-7 plastics.*

Q: *Pioneer Recycling Services mentioned they are putting film in landfills—are any of the other MRFs currently landfilling film?*

A: (from Waste Management). *Periodically, there is a demand for low grade film that we are able to meet. When there is no demand, we have to make a decision on what to do with those materials—at current, we are still exporting the materials to markets other than China.*

A: (from Recology). *We don't want to landfill anything so always look to other markets. It is a tough market for #3 – 7 as a whole and there are not a lot of favorable markets out there, but we are not landfilling film.*

Q: *Compared to MRFs in other states, is there anything in particular about Washington State that makes innovation more difficult?*

A: (from Waste Management)

- *There are layers of responsibilities in Washington that can make it difficult to implement non commingled recycling programs.*
- *Washington State has a more robust list of mixed plastics and is the only state that collects lids and caps.*
- *In Washington State we have 5-6 different processing plants.*

Perspectives on Additional Sorting and Processing

The second panel of the day included presidents from three sorting and processing facilities along the West Coast. Each panel member gave a short presentation on their current practices, barriers, and opportunities. A short Q&A session followed. Panel members included:

- Tony Moucachen – President, Merlin Plastics
- Nicole Janssen – President, Denton Plastics
- Mike Centers – President, Titus MRF Services

Merlin Plastics

Tony Mouchachen of Merlin Plastics kicked off with an overview of Merlin's history. The company was founded in Delta, British Columbia, in 1987 to process post-industrial plastics. By 2016, Merlin Plastic had received a patent for their process, opened locations in Alberta and New Westminster, BC, partnered with the Oregon Beverage Recycling Cooperative to recycle PET bottles in Oregon, and re-designed the sorting, washing, and processing systems used to processing #3 – 7 containers on the East Coast.

Mouchachen noted the economic and technical challenges of the industry, specifically the need for highly skilled staff and plentiful capital. Working towards the goal of a truly circular economy, having the right policy in place, cooperation across government, brand owners, and recycling industries, and moving away from a linear mindset toward an end-of-life oriented thought process were important contributors to Merlin Plastics success.

Additional barriers Mouchachen highlighted were in respect to marketing and pricing, specifically:

- Overcapacity of virgin resin estimates for 2018
- High carbon footprint of oil-based virgin resin compared to the same volume of recycled material and the associated environmental cost not priced into the package—leaving recycled resin at a disadvantage.
- Challenges caused by oversupply of virgin oil-based resin in one hand and lack of recognition for low carbon footprint packaging in the other.

Mouchachen mentions that all processors can sort the right commodities when the prices are high, but the issue is figuring out who will pay for the commodity when prices fall. To wrap up, Mouchachen shares his belief that achieving a sustainable model for processing ultimately comes down to good policy, product stewardship, and education across all industries involved.

Denton Plastics

Nicole Janssen, President of Denton Plastics spoke next. Denton Plastics is an end market for plastics, turning commodity grade materials into engineering grade pellets and other high-grade reusable material. Janssen began by highlighting research that Denton Plastics' is currently conducting to develop solutions for commercial and industrial issues surrounding processing. Research includes:

- Looking at what post-consumer resin (PCR) means and working to define it further
- Looking at what is being recycled at the curb
- Working to define what needs to be recycled based on end market demand and feedback from brands

Janssen noted that #3 – 7 is a catch all and suggested defining which materials are collected at the curb based on whether or not a given material contains polyethylene or polypropylene, two plastics that have recycling value. Janssen further stressed the need to clearly define what items should and should not be collected at the curb by stating that it's not just education that is needed, but also general social behavior change. It is behavior change, Janssen believes, that will get all generations on the path to better recycling habits. To minimize carbon footprint, Janssen suggests a regional recycling model, like that used in Oregon, be utilized industry wide.

As for current practices, Denton Plastics is not currently taking bales from the curbside and is working with MRFs directly to determine what containers and resins can be processed.

Titus MRF Services

Next up, president of Titus MRF Services, Mike Centers spoke about the challenges causing increased residuals at MRFs and how secondary MRFs are designed to collect and further sort those residuals.

Challenges causing increased residuals at MRFs include:

- Packaging materials changing too quickly to keep up
- Single stream blue bin
- Paper shift from 70 percent of the stream to 50 percent
- MRF machinery yield loss of 10-20 percent
- Glass cleaning and sorting

Like many of the day's speakers, Centers brings up the added challenge of the public's trust in the blue bin and belief that everything placed in the bin will be recycled. Centers explains that Titus MRF Services offers a system that holds the blue bin accountable in their ability to accept and sort residuals from other MRFs. Systems utilized by Titus are similar to those at other MRFs, but are designed to handle all materials. Centers notes that many of the materials found in the residuals are of high value, and that enough materials are baled from the residuals to have one truck load per month.

Currently, Titus MRF Services is running a pilot program in Los Angeles, where 12 hundred tons of material per month covering 500,000 homes is being sorted and baled.

Centers believes an important next step is development of data that supports pushing back on the packaging industry's rapidly changing products. As far as banning certain materials, Centers states that if specific materials continue to cause major issues for MRFs, the industry as a whole must make a uniform decision on whether or not to ban them.

Developmental Assistance for Altering or Building Domestic Infrastructure

Ellen Martin – VP of Impact and Reporting, Closed Loop Fund

The final presentation of the day came from Ellen Martin, Vice President of Impact and Reporting at the Closed Loop Fund. The Closed Loop Fund invests in businesses and technologies that optimize product supply chains to build the circular economy. Utilizing fund loan investments (co-owned), venture investments, and foundation grants, Closed Loop Fund investments are structured as follows:

- Below market rate loans provided to municipalities and companies to build infrastructure for recycling and waste reduction.
- Loans are repaid via landfill diversion savings and or commodity revenue from the increase in recycling.
- Funds are co-invested with local state agencies, economic development corporations, local banks, foundations, and other relevant institutions, thereby expanding the amount of capital invested.
- The investment period is 5 years with an average loan period of 7 years.

Martin also discussed the impact that National Sword has had on the Closed Loop Fund’s portfolio. She noted that, while there has certainly been an impact, the Closed Loop Fund’s portfolio has taken less of a hit than others. Effects of the National Sword ban on the fund includes:

- A buildup of inventory caused by increasing length of time it takes to move materials
- Various attempts MRFs are making to address contamination:
 - Investment in optical sorters, ballistic screens, scaling
 - Increased labor and use of robotics on the line
 - Development of better data
- MRF Operators need to be “best-in-class” in order to survive
- Uncertainty of end markets leading to the question of whether increased domestic infrastructure/capacity is possible
- Increased scrutiny of individual commodity levels and resistance to increasing volumes of low-value materials
- New opportunities for alternative collection infrastructure and business models

Moving forward, Martin anticipates that MRFs will further prioritize paper in order to meet end market demands. Martin closes by posing a question to the room, asking operators what access to capital looks like and how the Closed Loop Fund can help make advancements in infrastructure needed to increase domestic sorting and processing.

Closed Loop Fund Q&A

Questions raised during a brief Q&A session with Ellen Martin are highlighted in the chart below.

| | Question | Answer |
|-----------|---|---|
| Q1 | In what ways do brands that you work with value or maintain end of life accountability for materials they produce which end up in the blue bin? | The accountability piece is something that the Closed Loop Fund is very aware of and looks for in investments. |
| Q2 | For companies you invest in who are using plastics in their product, how much of an emphasis do you put on what they do with the plastics at the end of the life cycle? | Our emphasis when we invest is on post-consumer material. The emphasis is on closing the loop where there is value available and not prioritizing incineration. |
| Q3 | Given who the investors are, will being a part of Closed Loop Fund incentivize investors to incorporate recycled materials into their product? | I hope so – we are considering that our investors are making a commitment to closing the loop. |
| Q4 | Is there an opportunity to visit any of the Closed Loop deals you’ve made? | Absolutely. |

To close out the portion of the meeting focused on funding, Brian Young from the Department of Commerce shared information on how economic development agencies view the topic:

- Economic development agencies look at development from a sector of the economy and decides whether recycling fits into it.
- Recycling has not typically been a focus area of economic development but given recent events many agencies are beginning to see increased economic potential in recycling.
- As a state, the Department of Commerce does not give away money very often but does support the clean energy fund that was recently repassed.

- There are 40 million dollars available that many of today’s topics could qualify for, particularly if an argument could be made that a product supports clean energy.

Small Group Breakout

Next, meeting participants broke out into five pre-determined small groups to begin identifying concrete next steps toward establishing domestic sorting and processing of #3 – 7 plastics in the region. A facilitator was assigned to each group to guide participants through the following scenario and assignment:

- **Assumed Goal:** Establish domestic sorting and processing of #3-7 plastics in region.
- **Assignment:** Based on everything you know and what you have heard today, what tasks need to happen to achieve this goal? Note, we are assuming tasks are post collection, not consumer behavior or prevention tasks.
 - What are the top two tasks/activities that need to happen to achieve this goal?

Groups were broken out as follows:

| Red Group | Blue Group | Green Group | Yellow Group | Orange Group |
|--|--|---|--|---|
| Facilitator: Sheryl Anayas | Facilitator: Julie Colehour | Facilitator: Angela Wallis | Facilitator: Angela Pietschmann | Facilitator: Pat Kaufman |
| <ul style="list-style-type: none"> • Sego Jackson • Lauren Cole • Peter Spendelow • Polagaya McLaughlin • Emmie Leung • Nicole Janssen • Terry Bentley • Alli Kingfisher • Mike Young | <ul style="list-style-type: none"> • Hans VanDusen • Lisa Sepanski • Pete Chsim-Winfield • Stephanie Schwenger • Ron Jones • Tony Moucachen • Don Zimmerman • Todd Burnstein • Heather Trim • Yang Dai | <ul style="list-style-type: none"> • Mike Centers • Bryce Jacobson • Ken Snipes • Pat McLaughlin • Sabrina Combs • Mike Range • Jeff Sichmeller • Dave Clausus • Derek Ruckman • Ellen Martin | <ul style="list-style-type: none"> • Kris Beatty • Linda Knight • Quinn Apuzo • Vivian Leung • Scott Farling • Domenic Calabro • Janine Bogar | <ul style="list-style-type: none"> • Susan Fife-Ferris • Jeff Gaisford • John MacGilivray • Matt Stern • Paulina Leung • Kevin Kelly • Kevin Andrews • Danny Kermode • Brian Young • Yao Geng |

Each group identified two top tasks/activities and the key barriers, parties involved, and resources needed to accomplish each task. The following activities were identified by the five groups:

| Blue | Activity/Task | Barriers | Who’s Involved? | Resources Needed |
|------|-------------------------------------|--|---|--|
| #1 | Open a PRF in the Pacific Northwest | <ul style="list-style-type: none"> • Transportation • Location • Scale • Guaranteed Material • Time | <ul style="list-style-type: none"> • All MRFs • Government – both local and UTC • Private capital • Consumers • Commerce | <ul style="list-style-type: none"> • Funds • Political Incentive |
| #2 | Develop product stewardship | <ul style="list-style-type: none"> • Politics • Manufacturer opposition • Time | <ul style="list-style-type: none"> • Strong coalition of stakeholders • NWPSC • Local government • NGOs | <ul style="list-style-type: none"> • Stamina • Vision • Policy development • Strong leadership |

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| Green | Activity/Task | Barriers | Who's Involved? | Resources Needed |
|--------|--|--|--|--|
| #1 | Government: Define the decision makers: <ul style="list-style-type: none"> • Info they need • Who will influence them? | <ul style="list-style-type: none"> • Different government structures (city, county, authority) • Time • Rates | <ul style="list-style-type: none"> • Large stakeholder groups: <ul style="list-style-type: none"> ○ SWAC ○ SPU ○ King County ○ Cities ○ Operators | <ul style="list-style-type: none"> • Staff time (for meetings) • Data |
| #2 | Private/Public Sector: Create advanced PRF station capacity | <ul style="list-style-type: none"> • Lack of capital • Affordable space/sq footage needed | <ul style="list-style-type: none"> • Investors • MRF operators | <ul style="list-style-type: none"> • \$5M - \$20M • RFP • Guaranteed feedstock • Local end markets • Partnerships |
| Yellow | Activity/Task | Barriers | Who's Involved? | Resources Needed |
| #1 | Get buy in from local MRFs <ul style="list-style-type: none"> • Consolidate materials to create economics of scale • Obtain data | <ul style="list-style-type: none"> • Cheaper to landfill • Protect core business/commodity (paper) • No requirement • Buy in on recycle vs. landfill (CO2 footprint) | <ul style="list-style-type: none"> • MRFs • PRFs/secondary MRF • Local government • Residents | <ul style="list-style-type: none"> • Model policy to harmonize across regions • Funding • Political support • Tech experts |
| #2 | Partner with Department of Commerce: <ul style="list-style-type: none"> • Create market for product • Incentives • Land | <ul style="list-style-type: none"> • Value of material • Political will (lack of) • Funding/cost | <ul style="list-style-type: none"> • Department of commerce • Closed loop fund | <ul style="list-style-type: none"> • Data |
| Red | Activity/Task | Barriers | Who's Involved? | Resources Needed |
| #1 | Understand policy and tools to ensure materials are processed domestically (what does "new" infrastructure look like?) | <ul style="list-style-type: none"> • Fragmented systems within various parties | <ul style="list-style-type: none"> • Contracted cities • UTC • (Washington definitions of solid waste) | <ul style="list-style-type: none"> • FTES time • Guaranteed flow of material |
| #2 | Determine what the private sector can do right away | <ul style="list-style-type: none"> • Economics | <ul style="list-style-type: none"> • MRF contractors within region • Closed Loop Fund | <ul style="list-style-type: none"> • Funding |
| Orange | Activity/Task | Barriers | Who's Involved? | Resources Needed |
| #1 | Develop regional PRF Co-op/Improve Quality | <ul style="list-style-type: none"> • State and county level policy • Harmonizing collection | <ul style="list-style-type: none"> • State • Tri-county governments • MRFs • collectors | <ul style="list-style-type: none"> • Research data • Define stream |
| #2 | Market development | <ul style="list-style-type: none"> • Policy | <ul style="list-style-type: none"> • Government manufacturers | <ul style="list-style-type: none"> • Market research • Recycled content |

Full Group Discussion

Small groups reconvened to share and compare next steps. As apparent in the above charts, there were a number of similarities across group findings. Many groups identified the need to establish a PRF or MRF processing facility in the region as a next step. Fragmented policy, lack of funding/economics, and manufacturer opposition were the most frequently noted barriers. Similarities also existed across groups in parties involved, with all groups noting regional MRFs/collectors, state/local government, and investors as key players needed to achieve next steps. Funding, guaranteed/defined end markets, market research/data, funding, and political interest were among the top needed resources noted.

Additional discussion topics and needs that rose to the top during the full group discussion are listed below:

- Need for collaboration across industries
- Need for leadership from all entities on next steps
- Importance of keeping energy behind this topic going
- Private sector perspective on what the public sector can do to help move this forward:
 - Talk to the county, cities, lay out a hypothetical framework for intergovernmental agreements and present to the processors
 - Create a framework similar to the EPR
 - Create a co-op of shared interest/ownership with confirmation that a market place will be provided
 - Pinpoint conditions that need to be met in order to develop a new facility
 - Issue an RFI for processors to apply for – test the private sector to see what it’s capable of:
 - Identify what conglomerate needs to be formed
 - Fact finding to demonstrate the need

Closing Remarks

Closing remarks were provided by Susan Fife-Ferris, Director of Solid Waste Planning at SPU. Fife-Ferris inspired the room with her confidence and belief in the ability to find a solution for domestic sorting and processing of #3-7 and other mixed plastics. Fife-Ferris noted previous accomplishments to seemingly impossible issues, such as creating a statewide recycling program in just 30 years and urged the room to maintain confidence and momentum in making a real change. With common efforts and goals taking place all along the economically progressive West Coast, Fife-Ferris mentions, we must work together to be leaders in creating a solution that will keep our skies blue, waters clean and citizens healthy.

Findings

Current Conditions

1. 3-7 plastics currently make up a comparatively small portion of the curbside collected materials. However, their use in consumer packaging is increasing rapidly. In addition, very significant tonnage of 3-7 plastics remain in the disposal stream.

2. When collected for recycling, these plastics have typically been exported to China or SE Asia due to their low value and high cost to sort. As of January 1, 2018, China is no longer accepting these plastics for recycling creating a reduction in processing capacity for these materials.
3. There is growing concern about the social and environmental impacts of exporting 3-7 plastics to Asia and other markets. Concerns include “leakage” of these plastics into the marine and other environments and pollution caused by burning.
4. “Alternative markets” to China may be available in Vietnam or other parts of SE Asia. There are concerns that the materials are not being responsibly recycled and that there is the potential of adding to plastic pollution through the use of those markets.
5. The near- and likely longer-term market value of 3-7 plastics alone will not offset the costs of the additional domestic sorting. Therefore, “alternative markets” in SE Asia may be the least cost means of “moving” collected mixed plastics. Unless somehow directed to existing domestic processing, or to envisioned new facilities such as a regional PRF or secondary MRF, low value mixed plastics will continue to be shipped off-shore.

Domestic Processing Capacity for 3-7 Plastics

1. There are barriers to sorting 3-7 plastics into specific resin types at the Material Recovery Facilities in Washington for a variety of reasons. These reasons vary, and include:
 - Additional equipment, such as additional optical sorters, would be needed to do so.
 - There is not available space within existing MRFs to add equipment.
 - Adding equipment is expensive, complicated and would require reconfiguration of existing equipment.
 - The value of the additionally sorted plastics does not justify the costs of new equipment and reconfiguration where it is possible.
 - There are or could be storage space issues for the baled plastics. Space is needed to store higher volume materials prior to shipping and lower volume materials take up space for too long as adequate amounts are accumulated for markets.
 - There is not adequate financing to support these MRF upgrades, even if spatially feasible.
 - MRFs are particularly focused on meeting increased paper bale quality to protect this primary commodity and revenue source.
2. Merlin Plastics, Vancouver BC has adequate capacity to receive 3-7 plastics from Washington State MRFs for further sorting and processing.
 - Due to operating within an Extended Producer Responsibility (product stewardship) system in B.C., these same limitations do not exist for Emterra and Merlin Plastics, and 3-7 plastics are sorted to resin type for domestic markets.
 - Merlin can also sort 1-7 plastics as well as mixed containers (plastics, aluminum and paper cartons).
 - Merlin charges a fee for sorting and a payment based on the value of the commodities received.
3. Collected 3-7 plastics should not be disposed. In the short term, 3-7 plastics should be redirected to Merlin or other domestic facilities for further sorting, processing and recycling of these materials.

- How this is to be accomplished needs to be determined but likely requires a commitment to action by all parties, both private and public sector. This is the next step requiring immediate attention.

Long Term Domestic Processing Capacity

1. Policy, legislative and contractual tools need to be researched and determined to ensure that mixed plastics can be sorted domestically, including through the WUTC regulated collection services.
 - Without understanding and applying these tools, it is unclear if a new regional PRF or secondary MRF would be viable, or if so, what other factors would make it viable.
2. Research and steps are necessary to determine the need for and viability of a new PRF or secondary MRF to serve the region. While this may be a long-term solution, determining how this work can be done is a shorter-term task. Department of Commerce, Closed Loop Fund and Economic Development agencies could be key participants. Potential options include:
 - RFI process
 - Private sector initiatives and investment
 - Organizing a “co-op” structural and investment concept, etc.
3. Additional policy tools need to be explored for the long run. These include:
 - Policies that create market pull - recycled content legislation
 - Policies that provide financial support for more extensive and effective sorting and processing of packaging,
 - Financing depot or take back programs for materials problematic in the commingled recycling stream (such as product stewardship legislation).
4. Reducing the unnecessary use of single-use and low value plastics is an important and complimentary strategy.

Immediate Next Steps

SPU and King County Solid Waste, through the LinkUp Program, will undertake the tasks summarized below. We urge the private sector to proceed with directing 3-7 plastics to domestic sorting and processing facilities and consider longer-term infrastructure needs.

1. Determine the feasibility of further sorting and processing 3-7 plastics utilizing capacity at existing domestic facilities. Interview Merlin Plastics to thoroughly understand any transportation issues, capacity, and costs.
2. Conduct a series of interviews with cities that contract for recycling services, UTC staff and others to determine the feasibility of directing 3-7 plastics to a domestic facility through contracts or existing policy and processes.
3. Conduct a series of individual interviews with MRFs to document current practices, the quantity of 3-7 plastics handled, and opportunities and barriers to ensuring domestic sorting and processing of 3-7 plastics.
4. Research additional policy approaches outlined in the *Long Term Domestic Processing Capacity* section above.
5. Hold discussions with Department of Commerce, economic development agencies and Closed Loop Fund to define facility funding opportunities.

6. Develop a web page on the LinkUp website to post progress and developments. Utilize C+C to support King County and SPU in ongoing communications and outreach efforts.

Action Items for All Stakeholders

The following action items have been identified by King County and SPU as starting points to keep the conversation energized.

- A. Determine and take immediate steps to get currently collected mixed plastics to existing regional or other domestic plastics recovery facility for further sorting and processing.
 - Utilize existing plastic processing facilities that currently have capacity, such as Merlin.

- B. Determine mechanisms for all entities to ensure plastics are sorted and processed into useable resins domestically and are responsibly recycled. Develop draft language to accomplish those mechanisms. Key players and possible mechanisms include:
 - *MRFs and processors.* Commit to ensure responsible sorting and processing by establishing policy approaches.
 - *Cities, counties, haulers, etc. in WUTC system.* Determine effective tools for programs within the WUTC system. How can the WUTC assist with this situation, through policy or otherwise?
 - *Cities that contract for collection services.* What provisions can be inserted into existing or upcoming contracts to ensure domestic sorting and responsible recycling?
 - *Cities directly contracting for MRF services.* What provisions can be inserted into existing or upcoming contracts to ensure domestic sorting and responsible recycling? What actions can be taken without opening existing contracts?
 - *Manufacturers.* What are mechanisms to provide financial support for domestic sorting, such as through price supports, investing in facilities and EPR approaches?

- C. Determine feasibility, costs, return on investment, etc. for various approaches to secure domestic processing and markets:
 - Upgrade all local MRFs to further sort plastics and address issues around scale, storage of sorted plastics, etc.
 - Establish a secondary processing facility in region to further sort mixed materials, mixed plastics, larger residuals etc.
 - Establish a new plastic recovery facility in the region. Determine scale. Include consideration of chemical processing of plastics that can't be mechanically sorted or have no markets.
 - Establish a new end market within the region that can directly manufacture product with recycled content using curbside generated mixed plastics. (Integrigo Composites might be model)
 - Determine existing plastic manufacturing companies in region and work to determine if any directly use curbside generated mixed plastics.
 - Establish a film washing and processing facility in the region as a stand alone or in combination with options above.
 - Examine the feasibility of a "co-op" approach, defined in the meeting as a shared ownership and commitment to leadership and action, to any of the above.

- D. Determine other mechanisms for creating market draw or financing:
- Develop legislation requiring EPR or some financing mechanism to apply to single-use plastics with no or limited markets, that are difficult to sort, or that cannot be assured to be responsibly recycled.
 - Require that garbage, recycling, and organics collection bins be made with post-consumer resins from #3-7 plastics through contracts, corporate policy, etc. Develop specification language.
 - Work with Association of Plastic Recyclers, Recycling Partnership, Closed Loop Fund, Sustainable Packaging Coalition etc. to develop collection containers from post-consumer resin from plastic packaging materials including #3-7 plastics collected at the curb.
 - Expand Association of Plastic Recyclers Recycling Demand Champions to include major waste companies such as WM, Republic, Recology, Waste Connections and local companies such as Amazon and Costco, etc. <https://www.plasticsrecycling.org/recycling-demand-champions>
 - Leverage Sustainable Packaging Coalition's programs, influence and ASTRX project (in collaboration with Recycling Partnership.) <http://astrx.org/>
 - Develop recycled content legislation with recycled content credit mechanism.
- E. Determine mechanisms and programs to eliminate or reduce the use of single-use plastics with no or limited markets, that are difficult to sort, or that cannot be assured to be responsibly recycled. Waste prevention efforts can reduce the quantity of low value, difficult to sort single-use plastics.
- Implement bans and other policy or programmatic approaches to reduce the use of certain single-use plastics.
- F. Determine means to accomplish items above including:
- What financing is available through Closed Loop Fund or other sources and for what elements?
 - What assistance can be provided by Dept. of Commerce or Economic Development Agencies?
 - Who specifically should/can be engaged with accomplishing which tasks above?
 - What is the role of LinkUp Program?
 - Is an RFI process needed and for what?

Appendix A: Participant Feedback

Following the meeting, participants were asked to fill out an evaluation form with their feedback. In general, participants were interested in working toward increased domestic processing, with many indicating a desire for a work group and/or continued meetings on the topic. Additionally, a number of participants identified the need for an economic analysis of the industry.

Verbatim responses to key evaluation questions are provided below:

| Q1: In your opinion, what is the best next steps towards processing plastics domestically? |
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| <p><i>Explore what's possible of the following:</i></p> <ul style="list-style-type: none"> • <i>Social marketing approaches</i> • <i>Incentivizing recycling processing</i> • <i>Simplify the list of what is recycled to benefit the quality</i> • <i>Focus and emphasis on waste prevention</i> • <i>Working up-stream</i> • <i>Looking at demand first, then supply</i> • <i>Utilizing Canada's example of focusing on recovery goals, with performance expectations (EPR)</i> • <i>Need policies and regulations that support and create the economics</i> • <i>Need market development</i> |
| <p><i>The model using secondary MRFs where the first MRFs are co-op owners will be the least cost method to collect and sort all materials in the blue bin. But it is not free. The idea is to begin by charging the landfill avoidance cost less 10% so all MRFs get a dump fee break. Then share in revenue for selling the sorted material as long as that sorted material revenue covers the operating costs and interest for any loans.</i></p> <p><i>Given this is CO-OP with the first MRFs it will be sustainable as long as the City or region supports the concept that no material should leave the area unless it is going to mill by material type. A lot of the ocean plastic problem is driven by sending this type of material export.</i></p> |
| <p><i>Feasibility study. This can be accomplished by an RFI, RFEOI or having a consulting firm do interviews, etc. Cascadia or CH2M.</i></p> <p><i>Set up another meeting with the same group and go over the interview results.</i></p> |
| <p><i>It was interesting to see that all of the groups, individually of one another, reached the same conclusion that we need to consider a regional PRF. I agree that this is the ultimate solution and that this is something we need to pursue with the leadership of policy makers and leaders from the government entities with the most regional clout (re: Seattle, King County, SnoCo, etc) supported by municipalities, hauler, plastic recyclers, et al. I think we need to re-convene with a smaller group of subject matter experts (blue ribbon task force?) to come up with a strategy to get this issue more in the face of those policies makers (regional solid waste forums like SWAC and MSWAC, city and county council meetings, etc) to see if we can garner any political will for change. This is a regional issue that crosses city, county, state, and international boundaries but we could start smaller with something like a regional PRF located in the tri-county area to serve the area where most of the population lies.</i></p> |
| <p><i>Understanding the laws and rules, and procedural options available to the state, counties and cities to either create an environment that promotes 3-7 plastic recycling; or provide incentives to encourage investment in 3-7 plastic recycling.</i></p> <ul style="list-style-type: none"> • <i>Have MRFs and programs immediately begin to use Merlin to further process and recycle mixed plastics so we know that they are responsibly recycled. Document costs and any issues so that those can be dealt with.</i> • <i>Develop the necessary policies or tools to ensure mixed plastics are domestically sorted and recycled. Corporate policy, contracting text, whatever is necessary to do within the WUTC system. The key question is</i> |

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| <p><i>how to direct materials to local processing rather than to “alternative markets” that develop in other parts of Asia, or if markets again open up on China. Having outlets is different than ensuring responsible recycling.</i></p> <ul style="list-style-type: none"> • <i>Determine need for and feasibility of new or expanded facilities in region or if existing facilities are sufficient (and perhaps more economical)</i> |
| <p><i>Help key players (MRFs and primary/secondary processors establish the business case for additional sortation, processing and markets. Support end-markets.</i></p> |
| <p><i>Rate structure and willingness to pay → Economic reality</i></p> |
| <ul style="list-style-type: none"> • <i>RFI process (put out by coalition of cities/counties)</i> • <i>Update contracts/issue new contracts that require MRFs to recycle #3-7 with an explicit performance standard</i> |
| <ul style="list-style-type: none"> • <i>Begin with framework</i> • <i>Collect information re: material availability, processing technology available or needed markets, and historical and future parties, identify obstacles and methods to overcome them.</i> |
| <p><i>Pull the data together. You have to know what you’re dealing with so private industry people can model their business</i></p> |
| <p><i>Get buy in from key players</i></p> |
| <p><i>Examine policy tools available and understand economic barriers</i></p> |
| <p><i>Demonstrating the issue to policy members and educating them that the status quo is no longer viable.</i></p> |
| <ul style="list-style-type: none"> • <i>Getting an investigative group together to get data, gather political support and identify options. Decide if all the effort is worth the material.</i> • <i>Fix or modify rate structure to better represent list to recycle in our area.</i> |
| <p><i>Co-op development</i></p> |
| <p><i>PRF. Market development.</i></p> |
| <p><i>Group planning/state/local cities to group together</i></p> |
| <p><i>Establish a concept and get stakeholders to react</i></p> |
| <p><i>Develop a framework for developing a PRF</i></p> |
| <p><i>There is existing #3-7 processing capacity nearby that can immediately take #3-7 from this area</i></p> |
| <ul style="list-style-type: none"> • <i>A quick analysis of material volumes, operators and economics</i> • <i>An investable project</i> |
| <p><i>I like that the meeting in Seattle focused on finding a regional solution for processing #3-7 plastics domestically and agreed with Matt Stern's recommendation to begin with a framework and then fill in the details until a solution is reached or determined not to be viable.</i></p> |
| <p><i>Perhaps set up a “thought committee” or ad-hoc group. Direct requests for members—counties set it up?</i></p> |
| <p><i>Economic analysis</i></p> |
| <p><i>EPR legislation mandating recovery of plastics</i></p> |
| <p><i>MRF lead to site collective PRF</i></p> |
| <p><i>Creation of a regional funding mechanism that fits into a framework which guarantees flow and stability during bad market conditions.</i></p> |
| <p><i>Having local agents agree on a path forward and propose to MRFs (include domestic markets for materials)</i></p> |
| <p><i>More research and discussions on key parts—getting MRFs on board; researching funding and incentives</i></p> |

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| Q2: What next steps do you intend to take towards processing #3 – 7 (and film) plastics domestically |
| <i>Support my staff to make connections in support of West Coast processing</i> |
| <i>Honestly, I/we are hyper focused on fiber. This is more than 2/3 of material and has been highlight devalued. We have sold some loads to Merlin but he is hit-or-miss on what he wants and does not want. So, at this moment, not a huge focus on 3-7 plastics.</i> |
| <i>I'd like to do more but am at the mercy of our service provider. While they are contractually prohibited from landfilling collected recyclables, they can ask to landfill them if secondary markets dry up. But, I'm not in favor of using those secondary markets since we're just passing the problem on from China to Southeast Asia. I intend to continue to monitor what WM is doing with the materials with the expectation that they will come asking for relief at some point. In the short term, we have a choice to allow landfilling and/or do a full court press on an education and outreach effort and no longer accept 3-7s. This has to be a regional effort in lieu of a piecemeal city by city effort.</i> |
| <i>Continue to participate in work groups and other discussions; review agency policies and rules and laws to see what barriers might exist or what incentives might be available.</i> |
| <i>Continue to be engaged in scoping out next steps and implementation.</i> |
| <i>Ancillary support of infrastructure and market facilitation project</i> |
| <i>Continue to participate</i> |
| <i>Continue to work with Titus to understand and model items listed above</i> |
| <i>Government program will continue to facilitate stakeholder dialogue and initial supportive steps.</i> |
| <ul style="list-style-type: none"> • <i>Possibly participate in workgroup</i> • <i>Create shared proposal from WA and OR for Closed Loop Fund</i> |
| <i>Learn more about this issue; discussion with our regulated haulers</i> |
| <i>Explore a regional PRF, perhaps a tri-county facility that could be replicated in other parts of the state and on the West Coast.</i> |
| <i>Work to create a work group</i> |
| <i>Improve MRF equipment to process plastics</i> |
| <i>Working with local MRFs to take their 3-7 into BC</i> |
| <i>Cleaning material, finding new markets</i> |
| <i>We are a municipal hauler and will continue to work with our only MRF option.</i> |
| <i>Sharing my knowledge and experience from Canada with colleagues in the US</i> |
| <ul style="list-style-type: none"> • <i>Keep conversation going</i> • <i>Invest in scalable projects/models</i> |
| <i>I am continuing to work with Titus MRF Services on the concept of a Secondary MRF for the Pacific Northwest. I've already met with most of the MRFs in the Portland market and one from the Seattle market, and plan to meet with the rest within the coming weeks. I'd also like to work to improve the data we have available regarding composition and quantity of the blue bin materials, #3-7 bales, and MRF residue, specific to the Pacific Northwest.</i> |
| <i>Buy less of it!</i> |
| <i>Help push it!</i> |
| <i>Support/advocate for local processing</i> |
| <i>Specificity and processing in future contracts</i> |
| <i>Creating more opportunities to collaborate and create again</i> |
| <i>Developing a plan that works to ensure flow to a facility or facilities that can handle the material</i> |
| <i>Discuss with EPA HQ playing lead on our potential role</i> |
| <i>Continue to engage—researching commerce funding incentives</i> |
| Q3: Thinking about content, discussion, and participants, please provide any additional feedback, suggestions or ideas here. |
| <i>Unclear if a PRF or secondary sort is being considered.</i> |
| <i>It was my impression that the industry participants were willing to make changes as long as it was economically viable for them, but the current situation does not seem to promote any investment in domestic processing of 3-7</i> |

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| <i>plastics. Perhaps a deeper discussion with MRF operators on what it would actually take to get them to initiate some action, and potential timelines for implementation.</i> |
| <i>It is interesting that MRFs and programs in Canada under product stewardship schemes are not having the same problem and are actually further promoting collection and processing of 3-7 plastics.</i> |
| <i>Frame up the space to be innovative... folks to reluctant</i> |
| <i>Solicit cities/counties to provide land/building tax incentives, other economic assistance to private industries to open/operate a PRF</i> |
| <i>Can always use more time. Great job keeping the group on time and on task!</i> |
| <i>1 or 2 organizations to commit to long-term leading of the regional effort.</i> |
| <i>Great discussion, very busy agenda</i> |
| <i>It was helpful. Looking forward to notes.</i> |
| <i>Combine all plastics (King County to market. Hopefully local plastics recycler. MRFs for what they do best (paper/bailing)</i> |
| <i>The right people were in the room</i> |
| <i>It was a packed day, but flowed well</i> |
| <i>Would have been nice to have more end market representation – manufacturers</i> |
| <i>Including participants with a national focus, such as The Recycling Partnership, would help to guide solutions toward a more harmonized recycling system in the long-term.</i> |
| <i>Too short—need another hour and a longer break</i> |
| <i>Is plastics recovery (3-7) really the biggest problem facing recycling today? Is plastics where we should be putting our energies? Why plastics and not paper?</i> |
| <i>Identity cost delta</i> |
| <i>Create regional market development group. Domestic processing only.</i> |
| <i>Try to keep different plastics in the collection systems</i> |
| <i>Need to explore if recycling 3-7 is really worth it—does it make sense on a life-cycle basis?</i> |
| Q4: How else would you like to be involved with future activities on the topic of processing #3 – 7 (and film) plastics domestically? |
| <i>Invited to meetings and involved in the future due diligence. I would like to talk more about domestic opportunities for fiber though as that drives the economic engine of a processing facility.</i> <i>I'd welcome the opportunity to assist in the scoping and planning for a possible PRF and think that there would be a lot of value if we went the route of an RFI just to find out if it could be done and explore some ways in which it could be funded. An RFI, like RFQ's and RFP's can be issued with the express direction that the project is unfunded and that we're just want to evaluate the feasibility of a PRF with no commitment to award any contract to any of the proponents or information providers. I think it's a long road ahead of us but if we're thoughtful about who leads the effort, who is on the team, and how we package and present the problem, we can get backing from policy makers and elected and keep up the momentum.</i> |
| <i>Willing to participate in work group discussions and provide whatever knowledge I have based on my position.</i> |

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| <ul style="list-style-type: none"> • <i>More representatives from end users like Denton</i> • <i>Brand owners (maybe)</i> |
| <i>Alternative technologies in addition to existing processors/mills</i> |
| <i>Mailing list to get updates on this discussion</i> |
| <i>Would like to be kept in the loop on developments in public and private sector. Happy to contribute in my area of expertise.</i> |
| <i>Updates, possibly participate in work group. Future meetings.</i> |
| <i>Keep the momentum. Reach out as needed.</i> |
| <i>Group emails / more meeting invites</i> |
| <i>Updates, continued discus</i> |
| <i>Would like to stay informed of next steps – possible engage in activities if they are relevant to our business.</i> |
| <ul style="list-style-type: none"> • <i>Investment capital</i> • <i>Data and knowledge sharing</i> • <i>Partnerships and relationships with our network</i> |
| <i>This is a topic that I'm passionate about - I've spent the past decade working to recover value from complex waste streams through my work at MBA Polymers, Agilyx Corporation, and Titus MRF Services. I'd like to be involved in any way possible including work on the framework for #3-7 processing, collecting data to fill in the details for a northwest plan, completing waste characterization studies, evaluating sorting technologies, and developing feedback mechanisms for residents regarding cost of recycling vs. quality of blue bin materials.</i> |
| <i>Come to future meetings with stakeholders approach would be great</i> |
| <i>However I can best help and stay updated</i> |
| <i>Informed</i> |
| <i>I'd like to continue to participate</i> |

Appendix B: Meeting Agenda

| Time | Topic | Speaker / Moderator |
|----------------|--|--|
| 12:45 – 1:00pm | Check-in and be seated | |
| 1:00 – 1:25pm | <p>Welcome, Opening Remarks and Introductions</p> <ul style="list-style-type: none"> • Welcome and logistics • Participant Introductions • Starting the conversation | <ul style="list-style-type: none"> • Ken Snipes – Chief Administrative Officer and Deputy Director—Solid Waste Line of Business, Seattle Public Utilities • Mami Hara – CEO/General Manager, Seattle Public Utilities • Pat McLaughlin – Director, King County Solid Waste |
| 1:25 – 1:40pm | <p>Context</p> <ul style="list-style-type: none"> • The current landscape of #3 - #7 and other mixed plastics in Washington state • The importance of domestic processing to citizens and NGOs | <ul style="list-style-type: none"> • Alli Kingfisher – Materials Management and Sustainability Specialist, WA Department of Ecology • Heather Trim – Executive Director, Zero Waste Washington |
| 1:40 – 2:20pm | <p>Material Recovery Facilities Panel: Current Practices</p> <ul style="list-style-type: none"> • Sorting and marketing #3 - #7 and other mixed plastics today by local area MRFs • Perspectives on further sorting and processing these plastics domestically • Q&A | <p>Panel members</p> <ul style="list-style-type: none"> • Matt Stern – Director of Northwest Recycling Operations, Waste Management • Todd Burnstein – Account Manager, Recology • Don Zimmerman – Operations Manager, Republic Services • Dave Claugus – Vice President, Pioneer Recycling Services • Paulina Leung – Vice President of Corporate Strategy and Business Development, Emterra Group <p>Moderated by Segoo Jackson</p> |
| 2:20 – 3:00pm | <p>Perspectives from the Presidents of Merlin Plastics, Denton Plastics and Titus MRF Services</p> <ul style="list-style-type: none"> • Opportunities for additional sorting and processing domestically, barriers and challenges • Conditions needed for further processing domestically • New or expanded facility plans or concepts <p>Q&A</p> | <ul style="list-style-type: none"> • Tony Moucachen – President, Merlin Plastics • Nicole Janssen – President, Denton Plastics • Mike Centers – President, Titus MRF Services <p>Moderated by Segoo Jackson</p> |
| 3:00 – 3:20pm | <p>Developmental assistance for altering or building domestic infrastructure</p> <ul style="list-style-type: none"> • Closed Loop Fund • Brief statements from Economic Development agencies | <ul style="list-style-type: none"> • Ellen Martin – VP of Impact and Reporting, Closed Loop Fund <p>Economic Development Agency remarks</p> |



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|----------------------|---|-----------------------------|
| 3:20 – 3:30pm | Short Break | |
| 3:30 – 4:10pm | Small Group Exercise <ul style="list-style-type: none"> • What can be done now • What are next steps • Who are the key players | Moderated by Julie Colehour |
| 4:10 – 4:50pm | Reconvene for Full Group Discussion <ul style="list-style-type: none"> • Share findings Identify and agree on immediate next steps | Moderated by Julie Colehour |
| 4:50 – 5:00pm | Closing remarks | Susan Fife-Ferris |
| 5:00 – 6:00pm | Optional Networking Happy Hour to follow at the Arctic Club Seattle 700 3 rd Ave, Seattle, WA 98104 | |

Appendix C: Prepared Panel Questions for MRF Panel

1. What plastic commodity bales do you create and market (including film and mixed plastics)?
 - a. Which of the #3 – 7 plastics do you sort, bale and market?
 - b. Do the 3-7, mixed plastic and film bales meet any particular APR, ISRI or other industry specifications?
2. How are 3-7 and film plastics sorted from other materials and other plastics at your MRF?
3. Do you separately sort PP plastics from other mixed plastics?
4. Where do thermoform PET 1 plastics predominately end up? In PET bales, or 3-7 bales, or some in both?
5. What tonnage of 3-7 plastics, post-consumer film plastic, and other mixed plastics are you handling in a year? What percent of total materials that you handle does this comprise?
6. Where do 3-7, film plastics and mixed plastics get marketed? Please be as specific as you can be. For instance, exported to where? Domestic markets such as... etc.
7. How is the marketing of plastics bales done in your company? What role do local staff have compared to national corporate staff? What role do brokers play?
8. Does your company have any steps in place to ensure high recycling rate and high standards of environmental performance by those receiving these plastics down-stream?
9. With the new China initiatives, has your line slow down made a significant difference in #3-7 sorting quality or capability (or is it about the same)?
10. Recognizing that bale make up will fluctuate, have you done bale breaks on 3-7 bales and what does that show regarding percent make up of various materials?
11. Regarding residuals destined for disposal - do you have a residual material stream made up of larger materials, as well as a small residuals stream? Or are all residuals combined? Have you done characterizations of either or both of those residual streams and what do you know of their make up?
12. What are the barriers to further sorting 3-7 plastics at your MRF?
13. What are the barriers to further sorting 3-7 plastics domestically (including Canada)?
14. What are ways that those barriers can be overcome so that 3-7 plastics are further sorted and processed domestically? New equipment, facilities, corporate or public policies, payments, etc.?
15. What are the most challenging plastics to market? Which materials are accepted by local programs that you are unable to market?

Appendix D: Meeting Attendee List

| Name | Company |
|-------------------|----------------------------|
| Sheryl Anayas | SPU |
| Kevin Andrews | Merlin Plastics |
| Quinn Apuzo | Recology |
| Kris Beatty | King County Solid Waste |
| Terry Bentley | Recology |
| Janine Bogar | Dept. of Ecology |
| Todd Burnstein | Recology |
| Domenic Calabro | EPA |
| Pat Campbell | Kitsap County |
| Mike Centers | Titus MRF Services |
| Pete Christiansen | Dept. of Ecology |
| Dave Claugus | Pioneer Recycling Services |
| Lauren Cole | King County Solid Waste |
| Julie Colehour | C+C |
| Sabrina Combs | City of Bothell |
| Yang Dai | University of Washington |
| Scott Farling | Titus MRF Services |
| Susan Fife-Ferris | SPU |
| Jeff Gaisford | King County Solid Waste |
| Yao Geng | University of Washington |
| Sego Jackson | SPU |
| Bryce Jacobson | Oregon Metro |
| Nicole Janssen | Denton Plastics |
| Ron Jones | City of Olympia |
| Pat Kaufman | SPU |
| Kevin Kelly | Recology |
| Danny Kermode | WUTC |
| Alli Kingfisher | WA Dept. of Ecology |
| Linda Knight | City of Renton |
| Paulina Leung | Emterra Group |
| Vivian Leung | Emterra Group |
| Emmie Leung | Emterra Group |
| John MacGilivray | City of Kirkland |
| Ellen Martin | Closed Loop Fund |

DOMESTIC PROCESSING OF MIXED PLASTICS:
MEETING SUMMARY

| | |
|---------------------|---|
| Pat McLaughlin | King County Solid Waste |
| Polagaya McLaughlin | Snohomish County |
| Tony Moucachen | Merlin Plastics |
| Angela Pietschmann | SPU |
| Mike Range | Waste Management |
| Derek Ruckman | Recology |
| Stephanie Schwenger | City of Bellevue |
| Lisa Sepanski | King County Solid Waste |
| Jeff Sichmeller | Republic Services |
| Ken Snipes | SPU |
| Peter Spendelow | Oregon Dept. of Environmental Quality |
| Matt Stern | Waste Management |
| Don Tibbets | Republic Services |
| Heather Trim | Zero Waste Washington |
| Hans VanDusen | SPU |
| Angela Wallis | SPU |
| Pete Chism-Winfield | City of Portland Assc. Of OR Recyclers Board Member |
| Mike Young | WUTC |
| Brian Young | Department of Commerce |
| Don Zimmerman | Republic Services |