

Preliminary Study Results Processor Commodity Risk Fee Contamination Management Fee

October 6, 2023
Second Draft



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Executive Summary

This First Draft of the Processor Commodity Risk Fee (PCRF) and Contamination Management Fee (CMF) Preliminary Study Results provides Crowe's initial calculations of the components of the PCRF and CMF and initial cost per ton values for the fees to be paid to commingled recyclable processing facilities (CRPFs). There are still several outstanding items to incorporate into the results as rulemaking continues and additional data is available. While the results are preliminary, they represent a compilation and analysis of thousands of data points drawn from interviews, research, and dozens of documents provided by facilities. We have created models and templates to allow for further refinement and sensitivity analyses as we move forward over the next two months. Following this Executive Summary, the report is divided into seven sections and two appendices, as follows:

1. *Introduction to PCRF and CMF Study*
 2. *Methodology*
 3. *Initial Fee Study Cost Results*
 4. *Current Processing Cost Components and Initial Calculation of the PCRF*
 5. *Anticipated Program Costs*
 6. *Average Market Pricing Data and Methodology*
 7. *Annual Adjustment Methodologies for Consideration*
- Appendix A: Recycling Modernization Act*
Appendix B: Anticipated Program Costs.

A. Study and Methodology Overview

Crowe was contracted by the Oregon Department of Environmental Quality (DEQ) in November 2022 to conduct this PCRF and CMF fee study. Between November and May, Crowe developed a study design that documented the data gathering and cost calculation process. The study design was updated based on feedback and recommendations provided by DEQ and the Commingled Recycling Processing Facilities Technical Workgroup. Crowe conducted initial information calls with facilities during Spring 2023, developed Excel cost model templates, and conducted facility site visits in June and early July. Between June and August, Crowe continued discussions with CRPFs and received financial, labor, depreciation, operations, and benefit program data. The data gathering, analysis, and review process was extensive, culminating in the preliminary results in this report.

B. Preliminary Results

Exhibit 1 provides an overview of initial study results. Note that these figures will change as we incorporate additional facility data and clarify tonnage information. “Total” refers to the totals across the participating facilities.¹ The initial eligible processing cost for purposes of determining the PCRf is \$34,478,294 or \$121 per ton for the initial estimate of 285,542 tons of total eligible processing of commingled recyclables and non-covered product contamination removed and disposed in 2022. The initial cost of covered product contamination removal and disposal for purposes of determining the CMF is \$2,973,473, or \$191 per ton of covered product contamination removed and disposed based on an initial estimate of 15,575 tons of covered product contaminants in 2022.

Exhibit 1 Summary of Initial Cost Results

Category	Total Costs	Total Tons	Cost per Ton
Total Oregon Recyclable Processing ^a	\$75,424,507	580,348	\$130
Total Oregon Commingled Recyclable Processing ^b	\$37,451,767	301,117	\$124
Total Covered Product Contaminant Removal and Disposal	\$2,973,473	15,575	\$191
Total Eligible Processing of Commingled Recyclables	\$34,478,294	285,542	\$121

^a These totals represent total CRPF costs and tons including Oregon-specific commingled recyclable processing, source segregated recyclable processing, and non-Oregon recyclable processing.

^b These totals represent total Oregon-specific commingled recyclable processing costs and tons, including total covered product contaminant removal and disposal and total eligible processing of commingled recyclables marketed and shipped.

¹ ORS 459A.923(4) states that a commingled recycling facility must participate in the study in order to be eligible for the PCRf.

C. Example Calculation of the PCRf

The starting point of the PCRf calculation is the total eligible processing cost of recycling Oregon commingled recyclables, \$34,478,294, or \$121 per ton based on 2022 cost and tonnage data. As described in Section 4, Crowe recommends a profit / financial return of 11% on an earnings before tax basis. In the example calculations we apply the 11% to both the current eligible processing costs and the anticipated program processing costs. With profit included, the eligible processing cost is \$38,270,906, or \$134.03 per ton of eligible processed commingled recyclables marketed and shipped.

To complete the hypothetical calculation, we add a placeholder for anticipated program costs of \$100 per ton, or \$28,554,200 (NOTE: the actual calculated anticipated program cost per ton will replace this hypothetical number in a future draft). Applying an 11% profit results in an anticipated program cost of \$111 per ton. The sum of eligible processing costs with profit and anticipated program costs with profit is \$69,966,068, equal to \$245.03 per ton. Subtracting the initial calculation of the Oregon average commodity value, described in Section 6, of \$67.49 results in a PCRf of \$177.54 per ton. The PCRf is very sensitive to market prices.² For example, if we increase the base OCC market price to \$106 per ton, equal to the average price from September 2021 to August 2022, the Oregon average market price increases to \$122 per ton and the PCRf decreases to \$110 per ton. **Exhibit 2** illustrates the complete calculation for this initial example using the hypothetical anticipated cost value and preliminary cost results.

Exhibit 2 Example Calculation of PCRf (with MOCK Anticipated Program Costs)

Category	Amount	Result
Total Eligible Processing Cost	\$34,478,294	
Profit / Financial Return on Processing Costs	× 11%	= \$38,270,906
Total Anticipated Program Cost (MOCK ONLY)	\$100 per ton × 285,542 tons	= \$28,554,200
Profit / Financial Return on Anticipated Program Costs	× 11%	= \$31,695,162
Sum of Processing Costs, Anticipated Costs and Financial Return	\$38,270,906 + \$31,695,162	= \$69,966,068
Total Processed Tons	285,542 tons	= \$245.03 per ton
Oregon Average Price		– \$67.49 per ton
PCRf (MOCK ONLY)		= \$177.54 per ton

² The law requires that DEQ periodically update, but no more frequently than once per month, the average commodity value per ton of commingled materials collected in Oregon.

D. Average Market Pricing Data and Methodology

Crowe researched published scrap market pricing data and obtained 2022 price data from Oregon CRPFs to utilize in determining the average market pricing data methodology and to calculate initial pricing results. As we describe in Section 6, we made a number of assumptions and also identified several issues that should be addressed as we further refine the approach. For example, while average Oregon market price per ton as well as the individual annual average scrap prices for most commodities were not significantly different from published market data, monthly prices were dramatically different (both higher and lower). It will be important to understand the reasons for these differences as we refine the average market pricing methodology.

E. Anticipated Program Costs

The primary outstanding component of the Fee Study is determining anticipated program costs. Information on capture and outbound contamination rates, permit requirements, and living wage and supportive benefits levels were undetermined and/or preliminary at the time of our facility site visits. Crowe conducted initial interviews and gathered information that will inform our calculation of anticipated program costs. We will build on these initial discussions when we conduct follow-up interviews with facilities in October and November to determine anticipated program costs, focusing on three key categories of future program-related costs: administrative requirements, equipment and capital investments, and living wage and supportive benefits.

1. Introduction to PCRFB and CMF Study

The State of Oregon enacted the Recycling Modernization Act (RMA), Senate Bill 582, in 2021. The RMA defines a set of covered products (packaging, printing and writing paper, and food serviceware) and establishes a shared producer responsibility system for responsible recycling of these and other materials. Among its many other requirements, the RMA requires local governments to direct or cause to be directed commingled recyclables to processing facilities that are permitted or meet similar standards. These standards will require effective contamination removal (outbound bale quality), material capture rate, and transparency and responsibility in disposition. In addition, the RMA requires DEQ, through the Environmental Quality Commission, to adopt two fees:

- Contamination Management Fee (ORS 459A.920) – to be paid by producer responsibility organizations (PROs) to compensate facilities for the costs of removing and disposing of covered products that are contaminants (e.g., that are not identified as accepted in commingled programs for recycling purposes).
- Processor Commodity Risk Fee (ORS 459A.923) – to be paid by PROs to commingled recycling processing facilities to ensure that producers share in the costs of fully processing commingled recyclables that are covered products and to allow local governments to reduce the financial impacts on rate payers.

The CMF and PCRFB are intended to shift the cost of processing commingled recyclables, and the separation and disposing of covered products that are contaminants, from rate payers to PROs. **Appendix A** provides text of Sections 24 (ORS 459A.920) and 25 (ORS 459A.923) of the RMA that define the CMF and PCRFB.

Crowe prepared a study design, to describe the methodology and approach for determining the CMF and PCRFB. This first draft report provides initial results for both fees. The fees will be further determined and refined over the next several months for presentation to DEQ's Rule Making Advisory Committee in January 2024. Below we describe the information and results that are and are not provided in this preliminary draft report.

Information and Calculations Included in this Draft

- Initial calculation of processing costs eligible for the PCRFB
- Initial calculation of rate of financial return/profit for PCRFB
- Market pricing methodology and initial calculation
- Initial calculation of anticipated program costs related to living wage and supportive benefits
- Initial calculation of cost of contamination and CMF
- Overview of current CRPF technologies
- Initial calculations of category and material-specific eligible processing costs.

Information and Calculations to be Included in Future Drafts

- Update calculations using DEQ's 2023 Inbound and Outbound Commingled Recycling studies (available in late October)
- Refine 2022 commingled recyclable tonnage data such as confirming non-sorted/partially sorted commingled tonnage that is received and passed through to another facility for further processing
- Refine market pricing methodology and source data
- Refine eligible processing costs
- Refine contamination management fee
- Incorporate additional facility data as it becomes available
- Calculate anticipated program costs based on updated information on supportive benefits, permit requirements, analyses of equipment costs and needs, and additional interviews with CRPFs (interviews to be conducted in early November)
- Conduct sensitivity analyses of PCRFB and CMF based on varying fee assumptions of the components of each fee
- Determine method to adjust tonnage totals to align with each phase-in period (July 2025, January 2027, and January 2028).

2. Methodology

Crowe utilized the study design as a guide in determining the PCRf and CMF. This methodology section provides an additional level of detail on Crowe's modelling methodology and tasks conducted between March 2023 and August 2023. Our approach, in roughly chronological order, is as follows:

- Conducting initial preparation and developing Excel models
- Conducting field work, follow-up discussions, and data gathering
- Compiling data and modeling.

A. Preparation and Model Development

While Crowe was developing the study design, we were also researching CRPFs and beginning to develop the Excel cost model for the study.

1. Initial Facility Interviews

Prior to conducting field work and during the months of February, March, and April, Crowe conducted a series of one-on-one Teams calls with CRPFs. The purpose of these calls was to obtain an initial understanding of the facility operations, flow of materials, employees, and financial data. Crowe followed a structured process for each interview. First, we provided an overview of the study and our approach leveraging the Study Design. Next, we walked through a series of questions covering topics such as:

- Facility location and hours
- Materials handled
- Sources of material
- Operational processes
- Equipment
- Residual levels
- End-markets
- Employees and temporary labor
- Financial document
- Questions or concerns.

Through these interviews, Crowe gained an understanding of the range of operations and confirmed the general study approach as described in this document. Crowe utilized this information in finalizing the study design and in planning for the on-site visits.

2. Data Requests and Sources

Following the initial interviews Crowe sent a data request to each facility. In addition, we established a ShareFile account for each processing facility to allow them to securely upload information. For those facilities that did provide information to Crowe prior to our site visits, we stored the files on a secure SharePoint site accessible only to Crowe project team members, reviewed the data, and began to compile the data.

Several CRPFs did not have the data Crowe required at the time of the site visit. Once we met with facilities, we reviewed available information and sent follow-up data requests to each facility to identify additional information required to meet the needs of the fee study. Crowe worked with each facility to obtain the required information, some of which was received in late August and early September.

3. Model Development

Crowe utilized our Labor Allocation Cost Model as a foundation for developing the Oregon CRPF Cost Model template. This model includes over a dozen worksheets to input, calculate, summarize, and QC numerous data elements. We added Oregon-specific worksheets for CRPF tonnage data, depreciation schedules, and a living wage differential calculator. From the base template for each facility, we created a PCRf model and a CMF model in order to appropriately allocate costs between processing and covered product contamination removal and disposal. Each facility-specific model is set up to allocate costs based on labor (sort line activities) and various combinations of tonnage in addition to directly assigning costs, as applicable, to specific activities or materials.

The PCRf and CMF models are directly linked to an aggregation model that combines key cost and tonnage information together and calculates the cost per ton of the Total Eligible Processing of Commingled Recyclables and other key results.

B. Field Work, Follow-up Discussions, and Data Gathering

The Crowe team conducted on-site visits to 12 CRPF facilities during June and July 2023. **Exhibit 3** identifies the facilities and site visit dates. The team conducted initial interviews by phone and then spent between two and eight hours touring each facility and meeting with site management, operations, and financial team members.

As we received the data from each facility Crowe conducted follow-up interviews to discuss the data and clarify any remaining questions. These meetings were typically held virtually. The data gathering effort was iterative, with multiple communications as we worked through our data needs and clarified each facility's data.

Exhibit 3 Commingled Recycling Processing Facility Site Visits

Company Name	City, State	Site Visit Date
1. EFI Recycling	Portland (North), OR	June 26
2. EcoSort (Waste Connections Inc.)	Eugene, OR	June 28
3. Far West Recycling	Portland (Northeast), OR	June 30
4. Far West Recycling	Hillsboro, OR	June 29
5. Garten Services Recycling	Salem, OR	June 6
6. International Paper	Springfield, OR	June 28
7. Kahut Waste Services/K.B. Recycling (Waste Connections Inc.)	Clackamas, OR	June 8
8. Pioneer Recycling Services	Clackamas, OR	June 5
9. REACH ^a	Klamath Falls, OR	July 12
10. Recology Eel River	Samoa, CA	July 14
11. West Vancouver Materials Recovery Center (Waste Connections Inc.)	Vancouver, WA	June 7
12. WestRock Recycling Facility	Portland (Southeast), OR	June 27

^a REACH provided initial financial data and participated in discussions but did not process commingled recyclables during the study period (2022) and was not included in the analyses. REACH may be eligible for future PCRf/CMF funding if the facility is permitted and chooses to receive and process commingled USCL material under the RMA.

C. Data Compilation and Modeling

Crowe prepared an Excel model for each facility, incorporating applicable data, calculations, and allocations. In this section we describe the flow of data and allocation approaches we applied at the various steps of the process. We customized the allocations and calculations for each facility based on the materials handled, equipment utilized, employees, and extent of other business, non-Oregon, and/or source segregated materials.

1. Overview of Allocation Methods

Crowe utilized several different allocation methods, selecting the approach that best reflected a facility's operations. In many cases, we utilized several layers of allocations to remove costs that were not components of eligible processing costs. As data from the DEQ's 2023 Inbound and Outbound Commingled Recycling studies and other sources is available, we may incorporate additional allocation methods and/or update existing allocations.

- **Direct costs** – where facilities identified line-item costs specific to source segregated material, other business, commingled sort line, and/or specific material types, we allocated those costs directly to the appropriate category. For example, we allocated depreciation of an OCC optical sorter to OCC and we allocated landfill disposal fees to contamination management.
- **Labor hours/employee based** – Crowe's Excel Labor Allocation Cost Model utilizes employee labor hours to allocate employee time to source segregated material, other business activities, commingled sort line, and/or specific material types. We also utilized labor hours to allocate indirect costs that couldn't be more accurately allocated by other methods.
- **Tonnage** – Crowe utilized facility-specific relative tonnage data to allocate several categories of costs. For example, we allocated the cost of baling wire based on the percentage of outbound tons of all baled material (essentially everything but glass and scrap metal). We also utilized the relative tons of non-Oregon and source segregated material away from the cost of processing commingled recyclables.
- **2023 Inbound and Outbound Commingled Recycling studies** – we utilized the percentage of covered product contaminants from the inbound and outbound study to separate costs of covered and non-covered contaminants (44.8% of contaminants are covered products based on preliminary data). We may evaluate additional allocation approaches for contaminants as more inbound and outbound studies data is available.
- **Contamination rates** – where applicable we utilized Oregon-specific contamination rates to identify residual tonnage specific to Oregon.

To determine eligible processing costs Crowe classified and removed costs that were not associated with processing commingled recyclables. In addition, we allocated costs to identify initial material specific costs, where possible. Crowe allocated the following categories of costs, as applicable for each facility:

- **Other business activities (in financials)** – we typically utilized direct costs and labor allocation to separate other business activity costs
- **Non-Oregon activities** – we typically utilized relative tonnage data to separate costs associated with non-Oregon recyclables
- **Source segregated activities** – we typically utilized relative tonnage data to separate costs associated with source segregated materials; we also utilized labor allocations depending on whether or not source segregated material was run through the commingled sort line
- **Labor** – we allocated labor based on specific work activities (for example, working on the paper sort line); for non-sort line workers we generally allocated labor based on relative tonnage data

- **Material specific costs** – we utilized a combination of labor allocations for sort line workers, direct costing of specific line items, and tonnage data to identify material specific costs. We will incorporate allocations based on the inbound and outbound studies, as appropriate, as more data is available
- **Covered vs. non-covered contaminants** – we utilized the initial inbound study results for inbound contamination to separate residual tonnage between covered and non-covered contaminants.

2. Overview of Models, Cost Calculations, and Allocations for PCRf and CMF

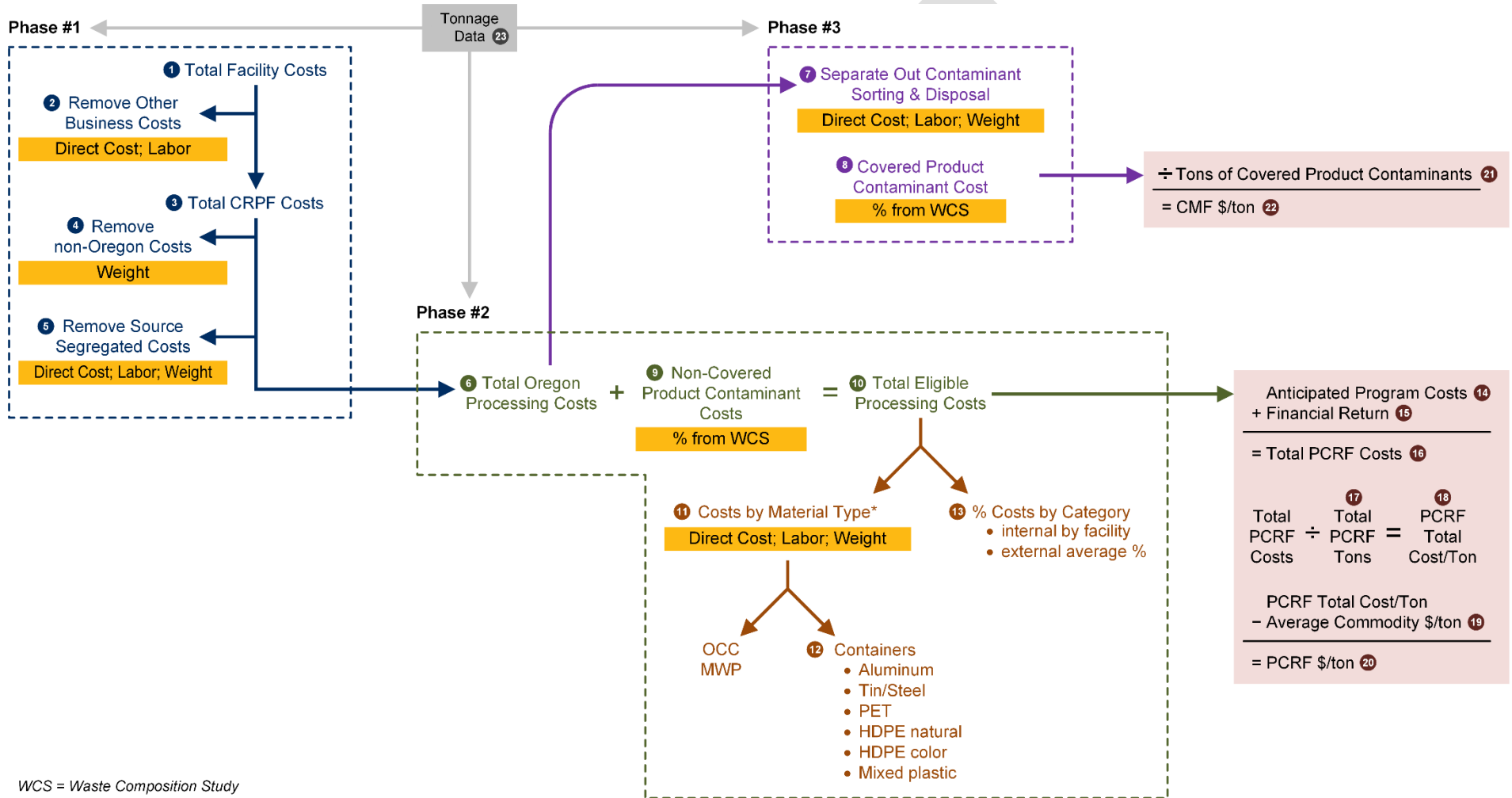
Within each facility's cost model and through the data compilation process, determining the PCRf, CMF, and more detailed results requires multiple layers of allocations and calculations. **Exhibit 4** provides an overview of the steps Crowe is utilizing in determining the two fees and additional cost category and material specific cost estimates. Our methodology essentially consists of peeling away layers of costs that are not part of processing commingled recyclables, aggregating costs across all facilities, and then, to the extent possible, splitting apart the total costs of commingled recyclables into smaller components.

For purposes of illustration, we divide the calculations into three phases, described below and illustrated by the dotted lines. Crowe utilized a customized Excel model for each facility. We followed a consistent methodology for each facility, preparing the model and allocating as applicable to each site. We then aggregated the data across the facilities to determine total costs associated with each phase and step.

The process starts with Phase #1, the purpose of which is to remove any facility costs not associated with processing Oregon commingled recyclables. Once we split away the other business, non-Oregon, and source segregated material costs, we utilize the remaining total Oregon Commingled Processing Costs in Phase #2. Crowe utilized Phase #2 to determine the total and component eligible processing costs for purposes of determining the PCRf, which includes the costs of contamination removal and disposal of non-covered products. In Phase #3 we determine the costs of contamination removal and disposal and to split contamination costs between covered and non-covered products in order to determine the CMF.

Throughout the exhibit we identify allocation methods for each calculation in the gold boxes. Following the exhibit, we provide a step-by-step description of the steps depicted by the circled numerals.

**Exhibit 4
Overview of Models and Cost Calculations**



WCS = Waste Composition Study
(DEQ's 2023 Inbound and Outbound Commingled Recycling studies)

* Costs by material will be approximate due to limited tonnage data.

1. **Total Facility Costs:** Total facility costs reflect the full set of costs in the financials provided by each CRPF. Depending on the facility, this could include costs associated with other business units as well as processing costs of non-Oregon and/or non-commingled recyclables.
2. Crowe removed “other business” costs using a mix of direct costing and labor allocations. For example, costs associated with equipment used in other business activities was direct costed to other business. If employees associated with the other business operations were included in the financial and labor data, Crowe categorized the labor hours and wages as other business and our labor allocation methodology separated out the associated wages and benefits plus allocated the relevant percentage of indirect costs to other business.
3. **Total CRPF Costs:** After removal of other business costs, the remaining costs reflect total CRPF costs. These include costs of processing both Oregon and non-Oregon materials and costs associated with recycling source segregated materials.
4. Crowe removed non-Oregon costs from total CRPF costs based on the percentages of inbound Oregon and non-Oregon recyclables at each facility in 2022. For example, if 85% of a facility’s incoming material is from Oregon and 15% is from other states, we multiplied total CRPF costs by 85% to determine the portion of CRPF costs associated with Oregon recyclables tonnage.
5. Crowe removed the costs associated with recycling source segregated material utilizing a combination of up to three allocation approaches: direct costs, weight (inbound tonnage), and/or labor hours allocation. We determined the appropriate allocation(s) based on how each facility handled source segregated material. For example, some facilities ran their source segregated material (primarily OCC) through the commingled sort line. For these facilities, we allocated a portion of OCC-specific sort line labor to source segregated material. In addition, we utilized the percentage of source segregated tonnage as compared to total Oregon processing tonnage to allocate a portion of indirect costs. If the facility incurred direct costs associated with source segregated material, such as a baler used only for this material, we split these costs away from the remaining costs of processing Oregon commingled materials.
6. **Total Oregon Processing Costs:** Once Crowe removed the three “buckets” of costs not related to processing Oregon commingled materials (other business, non-Oregon recyclables, and source segregated recyclables), the costs remaining in Phase #2 reflect the total cost of processing commingled recyclables from Oregon, including costs of contamination removal and disposal.
7. Crowe separated the cost of contamination removal and disposal from total Oregon processing costs using a combination of direct cost and labor allocations. We utilized direct cost allocations to capture transportation of residuals to landfill and landfill tip fees. These costs are specifically associated with residual from processing Oregon recyclables. Crowe utilized a labor allocation approach to identify direct labor costs and a relevant portion of indirect costs associated with contamination removal. We captured indirect costs such as rent using our labor allocation methodology. For example, if 10% of labor hours were associated with contaminant removal, then the model allocated 10% of rent costs to contaminant removal. We allocated 100% of labor associated with pre-sort to contaminant removal as these workers are primarily removing non-recyclables such as film from the sort line. In addition, we utilized a weight-based allocation (% of residuals as compared to total inbound Oregon recyclables in the sort line) to allocate a portion of workers on the OCC QC station because these workers are often removing additional film and contaminants that pass through the OCC screen. We assume that by the time recyclables have reached the paper line workers are primarily sorting out containers and by the time recyclables reach the container line the majority of non-recyclable residuals have been removed and the sorters are primarily positive sorting the appropriate container types.

8. Once we determined the cost of contamination removal and disposal in Phase #3, we split total costs of contamination between covered and non-covered products. Crowe utilized the percentage of inbound covered product contaminants as determined by DEQ's Inbound Commingled Recycling to identify the covered product component of contamination removal. Preliminary study results as of August 2023 identified that 44.8% of commingled contamination is covered product. We utilized this percentage to determine the cost of covered product contamination and the tons of covered product contamination for each facility that reported residuals. Where applicable, for facilities handling Oregon and non-Oregon material, we applied Oregon-specific residual rates.
9. Crowe determined the remaining cost of non-covered product contamination removal and disposal by multiplying the total cost of contamination removal and disposal by the percentage of non-covered product contaminants (100% minus 44.8% = 55.2%). This cost is included in total eligible processing costs.
10. To determine the total eligible processing costs, we took the total Oregon Processing costs minus the cost of covered product contaminant removal and disposal. The resulting figure reflects the total eligible costs of processing Oregon commingled recyclables based on 2022 facility data.
11. As a subset of Phase #2, we estimated, to the extent possible, material-specific processing costs per ton. We allocated total processing costs by utilizing direct costs (for example, depreciation of optical sorters used for a specific material), labor allocations (based on materials handled at sort line positions), and weight (based on weight of outbound materials).
12. At this point the material specific costs per ton should be viewed as best estimates. Crowe split costs first between fiber and containers. We split fiber costs between OCC and mixed paper. Not all facilities produce similar paper grades, so these two categories reflected the broader categories, understanding that not all OCC or mixed paper is the same. We split container costs into up to six categories: aluminum, tin and steel, PET, HDPE natural, HDPE color, and mixed plastic. In 2022, containers represented only 9.3% of total commingled recyclables. As the quantity of material decreases, it is more challenging to accurately determine costs. In addition, tonnage data reported by DEQ and the facilities do not necessarily align with sort line operations. For example, DEQ reports Other Plastic and Rigid Plastic Containers while facilities are sorting PET, HDPE natural, HDPE colored, and potentially a mixed plastic consistent of #3 to #7 plastic.
13. As a second subset of Phase #2, we calculated the percent of total eligible processing costs by our fifteen cost categories identified in the Study Design. In collaboration with the facilities, Crowe assigned cost categories to each line item on facility financials. We summed these across facilities to determine total and percent of total costs by category.
14. We will add total anticipated program costs to total eligible processing costs. We describe anticipated program costs further in Section 5.
15. Crowe identified a financial return percent as described in Section 4. In this step we multiplied sum of #10 (Total Eligible Processing Costs) and #14 (Anticipated Program Costs) by the financial return percentage of 11%.
16. The resulting value, Total PCRf Costs, reflects Oregon systemwide commingled recyclable processing costs, summing current (2022 costs), anticipated program costs, and incorporating a financial return.
17. To determine cost per ton, we divide total PCRf Costs by total outbound tons of Oregon systemwide commingled recyclables. We utilized 2022 tonnage data for this initial calculation.

18. The result is the PCRf Total Cost per Ton.
19. To determine PCRf payments to CRPFs, we must subtract the average commodity value per ton. This value, described in Section 6, reflects a weighted average value per ton, by end-market material type, and current market prices. DEQ will update the average commodity value monthly to determine the PCRf.
20. The PCRf, in dollars per ton, reflects the difference between the PCRf total cost per ton and the average commodity value, per ton. This is the payment CRPFs will receive, per ton, for the first tons of inbound commingled recyclables.
21. In order to determine the CMF, we divide the cost of removing and disposing of covered product contaminants by the tons of covered product contaminants as identified in DEQ's inbound study.
22. The CMF, in dollars per ton, will be paid to facilities based on tons of covered product contamination reported to the PRO.
23. This item reflects tonnage data, which informs all three models and various calculations. Crowe compared 2022 tonnage data as reported by CRPFs to DEQ and tonnage data within facility internal reports. Internal facility data generally was more detailed. We reconciled the two data sources and utilized facility data in most cases.

3. Initial Fee Study Cost Results

This section of the report provides initial costs associated with processing commingled recyclables in Oregon. Costs are based on facility data for 2022 and aggregated across the 11 facilities participating in the study. Tons are based on DEQ and facility data for 2022 and aggregated across the 11 facilities participating in the study. Tons partially processed in one facility and then shipped to a second facility for subsequent processing are only counted once in the overall system tonnage.

A. Total Processing and Contamination Management Costs

Exhibit 5 provides an overview of initial study results. Note that these figures will change as we incorporate additional facility data and clarify tonnage information. "Total" refers to the totals across the participating facilities.³ The initial eligible processing cost for purposes of determining the PCRf is \$34,478,294 or \$121 per ton for the initial estimate of 285,542 tons of total eligible processing of commingled recyclables and non-covered product contamination removed and disposed in 2022. The initial cost of covered product contamination removal and disposal for purposes of determining the CMF is \$2,973,473, or \$191 per ton of covered product contamination removed and disposed based on an initial estimate of 15,575 tons of covered product contaminants in 2022.

Exhibit 5 Summary of Initial Cost Results

Category	Total Costs	Total Tons	Cost per Ton
Total Oregon Recyclable Processing ^a	\$75,424,507	580,348	\$130
Total Oregon Commingled Recyclable Processing ^b	\$37,451,767	301,117	\$124
Total Contaminant Removal and Disposal	\$6,637,216	34,766	\$191
Total Covered Product Contaminant Removal and Disposal^c	\$2,973,473	15,575	\$191
Total Non-Covered Product Contaminant Removal and Disposal	\$3,663,743	19,191	\$191
Total Source Segregated and non-Oregon Costs	\$37,972,740	279,231	\$136
Total Eligible Processing of Commingled Recyclables	\$34,478,294	285,542	\$121

^a These totals represent total CRPF costs and outbound tons, including Oregon-specific commingled recyclable processing, source segregated recyclable processing, and non-Oregon recyclable processing.

^b These totals represent total Oregon-specific commingled recyclable processing costs and outbound tons, including total covered product contaminant removal and disposal and total eligible processing of commingled recyclables.

^c Crowe will evaluate additional allocation methods between covered and non-covered product contaminant removal and disposal when additional Inbound and Outbound studies data on residuals is available.

³ ORS 459A.923(4) states that a commingled recycling facility must participate in the study in order to be eligible for the PCRf.

4. Current Processing Cost Components and Initial Calculation of the PCRf

In this section we provide a preliminary build-up of the PCRf. These numbers are initial estimates and are based on partial data. We will be refining and finalizing the numbers over the next two months as additional information is available.

A. Profit / Reasonable Financial Return

ORS459A.923(1)(c)(A) of the RMA indicates that profit is an eligible processing cost. This section presents Crowe's assessment of a reasonable profit level for a commingled processing facility sorting materials from Oregon. As part of this analysis, we obtained and analyzed the following sources of comparable profitability data:

- Other states that provide a financial return for similar recycling subsidy programs
- Recent profit levels of publicly-traded companies providing service in the waste management/recycling industry
- Recent profit levels of small, medium, and large privately-held companies providing service in the waste management/recycling industry
- Regulated profit levels provided by State/local governments to waste management/recycling companies providing services under a contractual or franchise arrangement
- Actual profitability data from commingled recycling processing facilities we surveyed for this study.⁴

Analysis

Other states that provide a financial return for similar recycling subsidy programs

The State of California's beverage container processing fee program provides a reasonable financial return equal to 10 percent. This program charges beverage container manufacturers a fee to support recycling beverage containers in California.

Recent profit levels of publicly-traded companies providing service in the waste management/recycling industry

Over the past three years, the three largest publicly-traded waste management/recycling companies included WM (formerly Waste Management), Republic Services, and Waste Connections. On a combined weighted average basis, these companies had profit levels equal to 15.5% on an earnings before tax basis and 19.7% on an earnings before interest and tax basis.⁵ These companies are engaged in a variety of waste management activities, including collection, transportation, facility development/management, and disposal.

⁴ Note that there is not an available source of published financial return data for commingled processing facilities. As such, we relied on a variety of similar sources of financial return data for companies operating in the waste management/recycling industry.

⁵ Source: Published financial statements and 10-Ks.

Recent profit levels of small, medium, and large privately-held companies providing service in the waste management/recycling industry

Over the past three years, the Risk Management Association (RMA) reported the financial returns of between 150 and 158 waste management companies engaged in Administration & Waste Management Services - Solid Waste Collection (NAICS code 562111). On a combined weighted average basis, these companies had profit levels of 8.1% on an earnings before tax basis and 9.6% on an earnings before interest and tax basis. These companies are engaged in collection of refuse, recycling and organics materials.

Regulated profit levels provided by State/local governments to waste management/recycling companies providing services under a contractual or franchise arrangement

In Portland, Oregon, residential garbage rates are regulated by the City. The City provides haulers a target profit level equal to 9.5%.⁶ Washington County, Oregon sets rates using a target 10% profit level.

Based on an assessment of over 30 regulated waste management/recycling companies operating under a contract or franchise agreement with a city or county in California, the average profit level provided to these companies was approximately 11.1% on an earnings before tax basis and 11.5% on an earnings before interest and tax basis. These companies are engaged in a variety of waste management activities, ranging from collection, transportation, facility development/management, and disposal.

Actual profitability data from commingled recycling processing facilities we surveyed for this study

Weighted average financial returns, for those commingled recycling processing companies that were the subject of this study and provided data to determine their financial returns for 2022, were approximately 10.4% on an earnings before tax basis and 12.4% on an earnings before interest and tax basis. Financial returns for these companies ranged from approximately 8 to 18 percent.

Other Data Sources

According to IBIS World's Recycling Facilities industry report dated January 10, 2023, the average profit margin of recycling facilities will reach 7.2% in 2023.

Recommendations

We recommend that, for the purposes of setting the PCRPF, DEQ uses a reasonable financial return level equal to 11% on an earnings before tax basis.⁷ This financial return is essentially reflective of a middle point of the range of financial returns identified above and aligns closely with the predominant number of financial returns provided to waste management/recycling companies in a regulated environment.

We recommend that the DEQ allow for reasonable annual adjustments to the PCRPF and CMF such that this financial return level is not eroded over time (see Section 7). We also recommend that the DEQ revisit this financial return level within 5 years to determine that it continues to reflect a reasonable level commensurate with those experienced in the industry.⁸

⁶ Source: Residential Curbside Collection Service Rate Study, for rates effective July 1, 2023, City of Portland Bureau of Planning and Sustainability Solid Waste & Recycling.

⁷ There is no guarantee that a CRPF will earn a financial return in any given year.

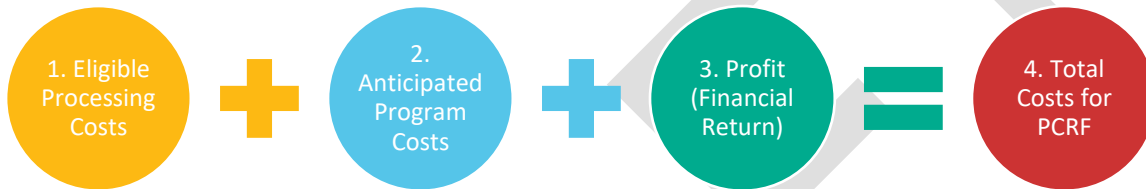
⁸ Per ORS 459A.920(5) and .923(6), DEQ reviews fees at least every five years but not more than annually. An exception exists for the PCRPF: if a study shows a more than 10% change in average per-ton processing cost since its last establishment, a revision is mandated.

C. Example Calculation of the PCRF

The total eligible processing cost of recycling Oregon commingled recyclables is \$34,478,294, or \$121 per ton based on 2022 facility cost and tonnage data. **Exhibit 6** illustrates the components of the PCRF and overall calculation process to sum the total processing costs for the PCRF.

As described above, Crowe recommends a profit / financial return of 11% on an earnings before tax basis. In the example calculations we apply the 11% to both the current eligible processing costs and the anticipated program processing costs as derived from this study. With profit included, the eligible processing cost is \$38,270,906, or \$134.03 per ton.⁹

Exhibit 6
Example Calculation of PCRF Total Costs



To complete the hypothetical calculation, and for illustration purposes only, we add a placeholder for anticipated program costs of \$100 per ton, or \$28,554,200 (NOTE: the actual calculated anticipated program cost per ton will replace this hypothetical number in a future draft). Applying an 11% profit results in an anticipated program cost of \$111 per ton. The sum of eligible processing costs with profit and anticipated program costs with profit is \$69,966,068, equal to \$245.03 per ton. Subtracting the initial calculation of the Oregon average commodity value, described in Section 6, of \$67.49 results in a PCRF of \$177.54 per ton. The PCRF is very sensitive to market prices. For example, if we increase the base OCC market price to \$106 per ton, equal to the average price from September 2021 to August 2022, the Oregon average market price increases to \$122 per ton and the PCRF decreases to \$110 per ton. **Exhibit 7** illustrates the complete calculation for this initial example using the hypothetical anticipated cost value and preliminary cost results.

Exhibit 7
Hypothetical Calculation of PCRF (with MOCK Anticipated Program Costs)

Category	Amount	Result
Total Eligible Processing Cost	\$34,478,294	
Profit / Financial Return on Processing Costs	× 11%	= \$38,270,906
Total Anticipated Program Cost (MOCK ONLY)	\$100 per ton × 285,542 tons	= \$28,554,200
Profit / Financial Return on Anticipated Program Costs	× 11%	= \$31,695,162
Sum of Processing Costs, Anticipated Costs and Financial Return	\$38,270,906 + \$31,695,162	= \$69,966,068
Total Processed Tons	285,542 tons	= \$245.03 per ton
Oregon Average Price		– \$67.49 per ton
PCRf (MOCK ONLY)		= \$177.54 per ton

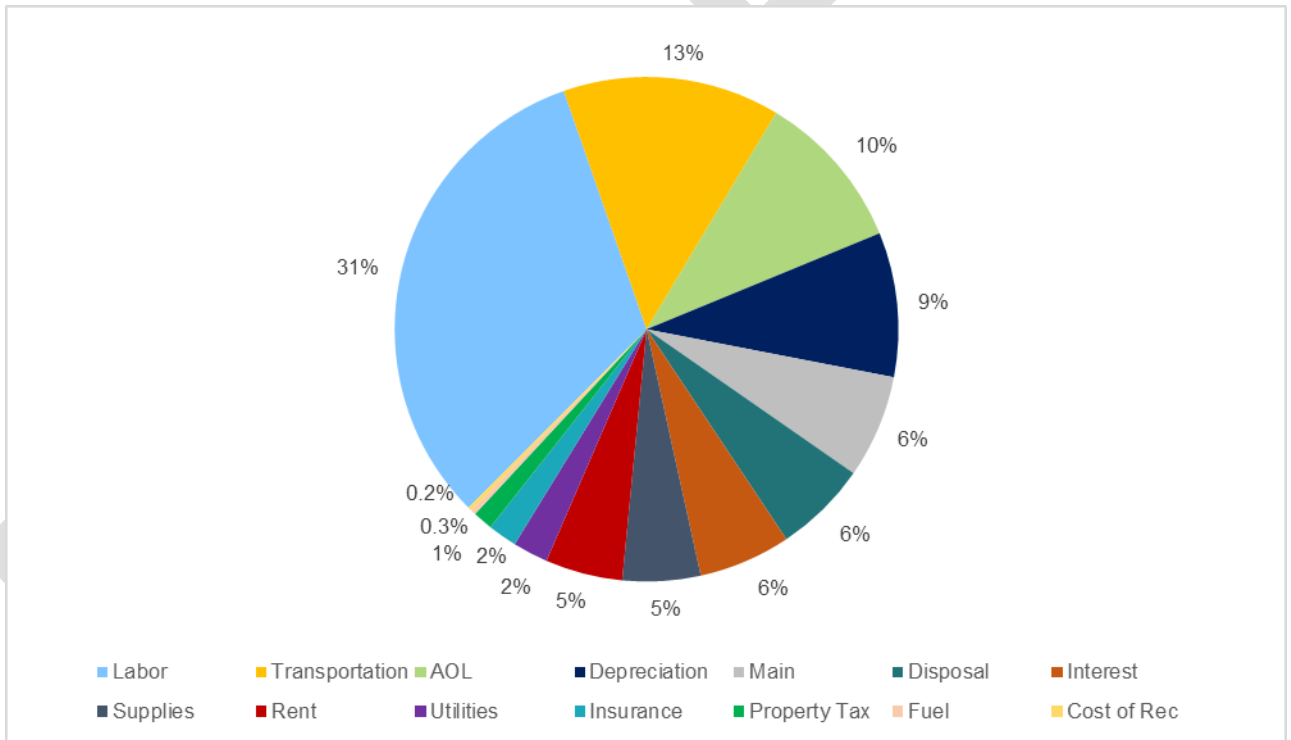
⁹ Reflects processing costs only in this report. Anticipated program costs will be incorporated as part of the total costs for PCRf in a future draft.

D. Costs by Category

Crowe calculated the percent of total costs for each of the fifteen cost categories we utilize in the cost model. While there were differences between facilities based on operational practices, the number of staff, and level of investment in equipment, the average percent of total costs by categories are reflective of the overall Oregon processing system. As illustrated in **Exhibit 8**, the categories contributing the greatest share to total processing costs are:

- Labor – at 31%, labor cost is the largest cost category
- Transportation – at 13% is the second largest cost category and reflects transportation to end market, and transportation of partially processed commingled recyclables for further processing at another CRPF.¹⁰
- All Other Labor (benefits and payroll taxes) – at 10% is the third largest cost category (41% when combined with the labor category)
- Depreciation and Maintenance are the next largest cost categories at 9% and 6%, respectively.

Exhibit 8
Percent of Total Eligible Processing Costs by Category



¹⁰ Transportation related to hauling to landfill is categorized as “Disposal,” along with tipping fees.

E. Initial Material-Specific Costs

Crowe calculated initial material-specific costs as part of the labor and cost allocation process. The material types used are consistent with the material types that the facilities report to DEQ on an annual basis. We then grouped the material types under three buckets: “Residual,” “Paper,” and “Containers.” For purposes of modeling, “residual” refers to materials that are generally not processed on the sort line but may not technically be residuals going to landfill (e.g., compacted recyclable material small enough to fall through paper screens into the residual stream). **Exhibit 9** provides initial material-specific costs, outbound tons, and cost per ton. These results combine both PCRf and CMF costs and outbound tons together to calculate a combined cost per ton by material type. The variability in cost per ton is driven by the combination of labor/indirect allocations and direct allocations as a result of our interview process with each facility. The variability within each material bucket is generally similar; “Residual” materials have higher costs, followed by “Containers,” then “Paper,” have the lowest costs.

Exhibit 9
PCRf and CMF Cost per Ton by Material

Material	Costs	Outbound Tons	Cost per Ton
“Residual”¹¹			
Landfill (Residual)	\$7,427,334	34,766	\$214
Glass (GL)	717,826	3,199	224
Scrap Metal (SCM)	592,432	2,734	217
Plastic Film (PF)	230,745	1,843	125
“Paper”			
Cardboard (OCC)	\$15,411,033	140,319	\$110
Paper Fiber (FIB)	8,850,949	92,645	96
“Containers”			
Tin and Steel Cans (TC)	\$774,553	4,051	\$191
Aluminum (AL)	395,704	2,310	171
Rigid Plastic Container (RPC)	1,470,284	9,627	153
OP (Other Plastic)	1,580,908	9,623	164
Total	\$37,451,767	301,117	\$124

¹¹ Glass and plastic film are not promoted for acceptance in any commingled collection programs in Oregon, but scrap metal is promoted for acceptance in some areas.

5. Anticipated Program Costs

Appendix D of the study design (included in this Draft as **Appendix B**) provides a description of Crowe's Anticipated Program Cost methodology. Much of the information required to calculate anticipated program costs had not been determined at the time of the facility site visits in June and permit requirements are still in the process of being finalized. Because many of the program requirements were still not defined, Crowe used the facility site visit as an opportunity to discuss anticipated program costs in general terms, to inform facilities about potential contamination rates and requirements, and to obtain facility's initial plans regarding changes to support program requirements. We informed all facilities that we would be conducting a second round of interviews regarding anticipated program costs in the fall.

For these reasons, Crowe's analysis of anticipated program costs is still a work in progress. This preliminary draft report provides initial estimates of the impact of the living wage and supportive benefits requirements and a general discussion of administrative and overall facility needs. Crowe will be conducting a more comprehensive assessment of anticipated program costs over the next two months.

A. Overview

Crowe will identify and include the following categories of costs, as we determine anticipated program costs. We discuss each of these in more detail in the remainder of this section.

- Administrative and reporting requirements necessary to comply with permits, including disposition reporting and responsible end market standards, for example:
 - Monthly tonnage reports to DEQ and invoicing to the PROs
 - Assessments and reporting related to customer-facing contamination
 - Potential reporting related to scrap pricing
 - Assessments and reporting related to verifying capture rates and contamination rates
 - Reporting associated with responsible end market requirements
 - Reporting associated with living wage and supportive benefits requirements.
- Operational changes necessary to add sorting capability for materials listed on the Uniform Statewide Collection List, for example:
 - Facility upgrades to sort cartons
 - Facility upgrades to sort additional PET, HDPE and PP bottles and containers (6 ounces to >2 gallons).
- Quality enhancements necessary to comply with permit requirements including costs associated with:
 - Re-running material through the sort line
 - Adding employees (or reducing employees)
 - Adding and/or upgrading equipment
 - Capacity expansions.
- Cost estimations to satisfy contamination standards currently proposed as 5% as of July 1, 2025, and 2% as of January 1, 2028.
- Cost estimates to satisfy the capture rates standards ultimately established during the rulemaking process, currently proposed at between 70% and 96%, depending on material type.
- Potential changes to material disposition, such as eschewing existing end markets that may not meet future standards for "responsible end markets" and/or sending partially-processed materials on to another commingled recycling processing facility (or other entity) for secondary processing.

- System-wide equipment costs based on varying assumptions of additional mechanical, optical, and robotic sorting equipment. For example, high-tech and low-tech upgrade scenarios and the Future System scenario identified in the RMA Modeling Study prepared by the Cascadia Consulting Group, Bell & Associates, and Circular Matters.
- Living wage and supportive benefits requirements, which take effect on January 1, 2027
 - Increases in wages based on current employee counts
 - Increases in wages based on potential future employee counts (reflecting increases and/or decreases from the current state)
 - Increases in benefits as compared to current levels (particularly for contract sort line workers)
 - Consideration of wage compression issues (this topic will be expanded upon in the second draft).

B. Summary of Initial Considerations Cited by CRPF Representatives

Below we provide a summary of CRPF's initial considerations, identified during facility visits in June, as related to anticipated program costs.

1. Contamination and Material Sorting Concerns:

- Concern that a lower contamination rate, such as 2%, would require re-running material, adding labor, and/or slowing down the sort line (leading to reduced capacity).
- Perspective that cartons are better collected at depots because they often end up on the container line; the additional cost of sorting cartons would be higher relative to the currently small volume of these containers.
- An opinion that receiving partially sorted material loose rather than baled would reduce contamination, as flattened containers are more likely to end up in paper bales.

2. Equipment and Technology:

- Perspective that while robots and optical equipment can replace sorters, facilities do not envision a complete elimination of people on the sort line. There will always be a need for roles such as presort, loading the metering bin, OCC post-sort, emptying bins, mechanics, equipment operators, etc.
- Perspective that one robot/optical sorter can replace at least two people, with a primary driver of the shift to optical sorters and robots being staffing challenges.
- Concern about the need for stronger magnets to capture metal cans.

3. Labor and Wage Concerns:

- Significant concerns regarding wage compression. When sorter wages are increased, positions requiring more responsibility, experience, skill, and/or risk will demand wage increases as well.
- Concerns about the ability to fill vacant positions currently and anticipated challenges in filling certain positions in the future.
- Concern that wage compression impacts are potentially greater for facilities with multiple business units (where workers in other areas may demand raises for parity) and CRPFs with operations in other nearby states.

4. Reporting and Compliance:

- Concern about the cost of measuring and tracking data to document compliance with capture and contamination rates.
- Perspective that monthly reporting could add an FTE (Full-Time Equivalent) and the likely need for an FTE person specifically for RMA-related reporting.

5. Specific Material Concerns:

- Concern about molded pulp packaging due to its low value.
- Concern about scrap metal due to problems it creates on the sorting line.

C. Administrative Costs

Anticipated program costs associated with administrative requirements will be linked to the permit requirements and associated reporting. Several of these requirements will be part of the November rulemaking. In our follow-up interviews with CRPFs, we will address items including but not limited to the items listed below. In initial discussions with facilities, several indicated they would likely need to hire an additional person to support various administrative requirements. These estimates did not consider staff time for measuring inbound contamination, capture rates, or contamination rates. Potential new administrative requirements include:

- **Fees and Permits:**
 - Paying permit fees associated with the new permit for Oregon CRPFs
 - Paying certification fees associated with out-of-state CRPF certification
- **Compliance and Inspections:**
 - Participating in inspections, assessments, and demonstrating compliance with capture rates and outbound contamination rate performance standards
 - Demonstrating compliance with responsible end market requirements, including accurately reporting the final end market of materials
 - Evaluating and reporting on inbound material quality and contamination
- **Reporting Requirements:**
 - Preparing and submitting monthly tonnage reports to DEQ and PROs
 - Reporting associated with living wage and supportive benefit requirements.

D. Equipment and Capital Investment Costs

In our upcoming research and discussions with CRPFs, Crowe will further evaluate individual and overall system requirements and facility upgrade options as they relate to equipment and capital investment costs to meet anticipated program requirements. The focus will be on additional investments required to meet the proposed capture and contamination rates and possible use of AI for assessment and automation purposes. Crowe will evaluate several scenarios and consider facility plans as well as overall system needs while excluding costs of facility upgrades that are part of regular equipment lifecycles. We will also consider the related impact to living wage and supportive benefit requirements that will result from replacing sort line workers with automated equipment.

Within our analysis we will consider a low-tech alternative (adding fewer/to no pieces of new equipment but adding more sort line workers) and a high-tech alternative (adding more new equipment and reducing or adding fewer sort line workers). We will be making the most appropriate assumptions about the mix of technology and labor that is most likely at each facility based on interviews, existing/planned modifications, and projected overall system needs. While we recognize that there is ongoing discussion regarding build out of one or more new state-of-the-art CRPFs in the state, our anticipated cost analysis will not consider the costs of a new facility. Our approach is generally to take a conservative perspective on the minimum that will be required by existing facilities to meet capture and contamination requirements for the materials currently on the USCL, for low-tech and high-tech scenarios.

The numbered sections below provide a insights on current systemwide equipment and staffing, a discussion of Oregon commingled recycles material flow, and example of equipment costs using the RMA Modeling Study.

1. Overview of Current Systemwide Equipment and Staffing

Exhibit 10 provides a summary of sort line equipment across 11 facilities currently recycling Oregon commingled recyclables. We will utilize this list as a starting point for considering the addition of sort line equipment to the overall system. This overview excludes rolling stock – forklifts, loaders, bobcats – which are utilized across all facilities.

Exhibit 11 provides a summary of existing staffing across the 11 CRPFs including in our cost analyses and a calculated tons processed per FTE. The exhibit summarizes total employees, by type, handling Oregon commingled recyclables. Overall, sort line workers include roughly 70% company staff and 30% contract staff. Warehouse and office workers are generally company staff. The overall mix of staffing, particularly sort line workers, will vary in the low-tech and high-tech scenarios, as workers are added to increase sorting capacity or replaced by optical sorters and robots. We expect that a higher tech CRPF would have a higher tons processed per FTE than a lower tech CRPF.

Exhibit 10 Summary of Total CRPF Sort Line Equipment in All Facilities Handling Oregon Commingled Recyclables

Equipment	Number in Operation	Notes
AI Vision System*	X	Potential for additional systems to increase quality and automating assessment
OCC Screen	9	Existing in most facilities
Paper Screens / Polishing Screens	18	Existing in all facilities; more screens could be added
Glass Screen/Nihot	3	Limited use in Oregon
Unders Recovery System	1	Potential for additional systems to increase capture rates
OCC and Paper Optical Sorters	4	Potential for additional systems to increase quality
Paper Robots	6	Potential for additional systems to increase quality and capture rates
Magnet	7	Potential for additional and/or stronger magnets
Eddy Current	5	Potential for additional if more container lines are added
Container Optical Sorters	3	Potential for additional systems to increase quality and capture rates and to sort additional plastics
Container Robots	5	Potential for additional systems to increase quality and capture rates and to sort additional plastics
Baler	16	Existing in all facilities; several have been upgraded in recent years

*Multiple facilities are in the process of obtaining an AI system

Exhibit 11 Summary of Total Employees by Category in All CRPFs Handling Oregon Commingled Recyclables

General Labor Categories	Number of FTEs (2022)
Sort Line	106.0
Warehouse	83.2
Office	61.3
Total CRPF Staffing	250.5
Sorted Commingled Tons	301,117
Tons Processed per FTE	1,202

2. Initial Discussion of Oregon Commingled Recyclables Material Flow

Understanding the existing flow of materials and status of facilities in Oregon will be important in informing the future scenarios and anticipated program costs. Within the current system of processing Oregon commingled recyclables there is a mix of facilities conducting full and partial sorts. Full sorts refer to facilities that are sorting and removing fiber (OCC and paper fiber) and containers (aluminum, tin/steel, PET, HDPE natural, HDPE colored, other plastics). Partial sorts refer to facilities that are accepting commingled recyclables and removing OCC and/or paper fiber, then transporting the remaining commingled recyclables to a full sort facility to remove any remaining fiber and containers. Some partial sort facilities also remove bulky plastics and some trash while others only remove fiber. Currently, about 10% of Oregon commingled recyclables are handled at partial sort facilities and 90% at full sort facilities. Roughly 25% of overall commingled tonnage is transported from partial to full sort facilities for additional processing.

Another way to evaluate current Oregon system capacity is through the low-tech/high-tech lens. Here, as a generalization, we consider facilities that are not utilizing optical sorters and/or robots as low-tech and those that have one or more optical sorters and robots as high-tech. Currently, approximately 40% of Oregon commingled recyclables are processed at a low-tech facility and the remaining 60% are processed at a high-tech facility. The low-tech and high-tech classification is not consistently aligned with the partial and full sort classifications. There are full sort facilities that do not utilize opticals or robots and partial sort facilities that do.

In our follow-up interviews with facilities, we will focus on the additional staffing and facility needs to meet capture and contamination rates. Outgoing bale contamination rates are currently proposed at 5% as of July 1, 2025, and 2% as of January 1, 2028. Initial proposed capture rates are identified in **Exhibit 12**. Capture rates may be updated based on data from the DEQ's 2023 Inbound and Outbound studies.

**Exhibit 12
Proposed Capture Rates**

Material	Initial (July 1, 2025) ¹²	Future (January 1, 2028) ¹³
OCC (includes Kraft paper)	96%	97%
Printing and writing paper (includes ONP, magazines, etc.)	96%	97%
Cartons	78%	88%
Polycoated cups	78%	88%
PET bottles and containers (6 ounces to 2 gallons)	85%	93%
HDPE bottles and containers (6 ounces to 2 gallons)	88%	95%
HDPE and PP tubs & pails (2 to 5 gallons) and PP bottles and containers (6 ounces to 2 gallons)	83%	93%
HDPE and PP flower pots (4 inches to 2 gallons)	70%	89%
HDPE and PP flower pots (>2 gallons)	85%	92%
Accepted aluminum (beverage and food)	88%	96%
Deposit and other steel cans accepted at curb	93%	98%
Other scrap metal (non-ferrous + mixed metal) accepted at curb	88%	98%

¹² As of the September 25, 2023, Technical Work Group Meeting.

¹³ As of the June 13, 2023, Technical Work Group Meeting. Subject to change.

3. Equipment Cost Example Utilizing RMA Modeling Study¹⁴

DEQ’s *Overview of Scenario Modeling* study analyzed and modeled a variety of different policy and program scenarios to inform development of material acceptance lists. The modeling included determining direct and indirect costs for 24 different options related to which materials to collect, how to collect them, and where to process them. The study identified equipment needs for a future system that would include higher quality standards and sorting of additional materials as compared to the current, system. Within the future system the study identified specific equipment to be added to different facilities, as well as fully installed equipment costs. **Exhibit 13** provides a summary of additional equipment, per unit costs, and total costs in Appendix B, MRF Capital Equipment Unit Costs from the study. Crowe estimated quantities of equipment to balance between optical sorters and robots, where applicable. This example future system provides one estimate of a high-tech scenario related to equipment. Based on 2022 commingled tonnage of approximately 300,000, this equipment cost, excluding interest on loans, would add \$71.75 per ton in anticipated program costs. Adding in an 11% profit, the additional equipment cost would be \$79.64 per ton. The assumption provides a rough estimate of the potential scale of additional equipment costs. If we instead assumed a ten-year depreciation and allocated only 1/10th of the costs per year to anticipated program costs, the per ton costs would be reduced ten-fold. In addition, it does not take into account potential reduction in labor and grants that might reduce overall costs incurred by facilities, additional interest costs that would be associated with borrowing to purchase equipment, and maintenance of new equipment.

Exhibit 13
Buildout of Anticipated Program Costs based on RMA Modeling Study Future System

Equipment	Number	Per Unit Cost ¹⁵	Total System Cost (One Time)
Fiber Line Upgrade - Screens	6	\$527,700	\$3,166,200
Fiber Line Upgrade - Robots	3	\$407,600	\$1,222,800
Fiber Line Upgrade – Optical Sorters	3	\$1,400,000	\$4,200,000
Metal Line Upgrade – Magnets	4	\$75,000	\$300,000
Metal Line Upgrade – Eddy Current	1	\$90,000	\$90,000
Metal Line Upgrade – Container Optical Sorters	3	\$869,000	\$2,607,000
Metal Line Upgrade – Container Robots	3	\$407,600	\$1,222,800
PET Thermoform Upgrade	1	\$869,000	\$869,000
Unders Recovery Systems	6	\$650,000	\$3,900,000
AI Visioning Systems (for QC)	8	\$106,000	\$848,000
Container Sort Line	1	\$3,178,000	\$3,178,000
Total Cost (One Time)			\$21,603,800

¹⁴ Overview of Scenario Modeling: Oregon Plastic Pollution and Recycling Modernization Act. Prepared for the Oregon Department of Environmental Quality by Cascadia Consulting Group, Bell & Associates, and Circular Matters. March 14, 2023.

¹⁵ Source: DEQ’s Overview of Scenario Modeling study dated March 14, 2023, Appendix B, MRF Capital Equipment Unit Costs

E. Living Wage and Supportive Benefits Costs

Starting January 1, 2027, ORS 459A.905(2)(c) prohibits local governments from sending their commingled recyclables to processing facilities unless the “processor provides workers at the facility with a living wage and supportive benefits, as defined by the rule by the Environmental Quality Commission”. On June 29, 2023, Oregon DEQ published a draft initial rule concept that proposes definitions for the terms “workers at the facility”, “living wage” and “supportive benefits” and proposes what data sources or other supporting information will be used to determine the parameters of these terms.

In this section, we are providing our initial results of the impacts of living wage component of ORS 459A.905(2)(c). Results for the supportive benefits component will be included in a future draft. For living wage, Oregon DEQ proposed to use the MIT Living Wage Calculator¹⁶ based on each facility’s county. The calculator is based on December 2022 dollars. We used a 3.1% annual CPI¹⁷ adjustment to calculate an estimated living wage rate as of January 2027. The rates vary throughout the state and includes two counties outside of Oregon to incorporate those facilities processing Oregon materials.

Exhibit 14 provides the calculated estimated living wage levels as of January 2027 using a combination of 1 working adult and 0 dependents (1/0) and 2 working adults and 2 dependents (2/2). Specifically, the living wage is weighted by summing the living wages using 35% of 1 working adult and 0 dependents and 65% of 2 working adults and 2 dependents. Below is a sample calculation using Multnomah county:

1 Working Adult, 0 Dependents at 35%	2 Working Adults, 2 Dependents at 65%	Combined Wage
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$$\text{Living Wage (Jan 2027)} = (35\% \times \$24.91) + (65\% \times \$32.03) = \$29.54$$

Crowe calculated an estimated PCRF costs to incorporate the January 2027 living wage rates. Our general methodology identifies all positions at a facility being paid lower than the estimated January 2027 living wage rates and increases the rates for those positions to match the requirement. Then, to address likely wage compression impacts, we calculated the average hourly rate difference between the lower wage workers and the living wage level and applied this per hour dollar amount increase to the remaining CRPF staff. We did not adjust benefits for facility staff nor the benefits and administrative fee for contract staff. Therefore, these adjustments represent a lower-end impact of the wage rate increases.

Exhibit 14
Estimated Living Wage Rates as of January 2027

#	State	County	1 Working Adult, 0 Dependents at 35%		2 Working Adults, 2 Dependents at 65%		Combined Wage	
			Dec 2022	Jan 2027	Dec 2022	Jan 2027	Dec 2022	Jan 2027
1	Oregon	Washington	\$21.85	\$24.91	\$28.09	\$32.03	\$25.91	\$29.54
2	Oregon	Multnomah	21.85	24.91	28.09	32.03	25.91	29.54
3	Oregon	Clackamas	21.85	24.91	28.09	32.03	25.91	29.54
4	Oregon	Marion	17.56	20.02	24.82	28.30	22.28	25.40
5	Oregon	Lane	17.46	19.91	25.89	29.52	22.94	26.16
6	Oregon	Klamath	15.75	17.96	24.12	27.50	21.19	24.16
7	California	Humboldt	16.41	18.71	25.76	29.37	22.49	25.64
8	Washington	Clark	20.94	23.88	26.98	30.76	24.87	28.35

¹⁶ Living Wage Calculator. Massachusetts Institute of Technology. <https://livingwage.mit.edu/>. June 2023.

¹⁷ CPI-U. All items in West urban, all urban consumers, not seasonally adjusted. Based on an average annual change in the index from 2013-2022.

Although calculations for this analysis are related to the PCRf, but the percent increase to the cost per ton would be the same or similar for the CMF. This impact would be more significant for a facility with a higher portion of labor as a percent of total costs and lower hourly rates (i.e., facilities that have higher hourly rates are less impacted than the facilities with lower hourly rates). **Exhibit 15** provides the initial PCRf costs per ton with the estimated living wage adjustment that includes additional compensation of higher-paid workers. These adjustments increase the labor category that currently represents 31% of total costs.

Exhibit 15
PCRf Costs per Ton with January 2027 Living Wage Adjustment (with compression)

	PCRf Costs	PCRf Tons	PCRf Cost per Ton
PCRf Costs	\$34,478,294	285,542	\$121
PCRf Costs with Living Wage Adjustment	\$38,003,405	285,542	\$133
Difference	\$3,525,111	–	\$12 per ton
% Difference			10% higher costs

Although the method we used to calculate these initial differences represents a relatively conservative approach (e.g., does not include proportional increases to benefits), it's important to note that because the PCRf and CMF fees will be implemented 1.5 years prior to the implementation of the living wage and supportive benefits requirements, actual differences between what it may be in January 2027 would likely be less than what can be calculated from today using 2022 data. Costs will naturally increase with the cost of living, which will offset the overall impact of increases in higher hourly rates.

We understand that every facility is managed and operated differently. Some facilities have additional lines of business that are co-located with the CRPF operations or have other operations with similarly skilled workers. Although we did not attempt to calculate potential 'ripple effect' beyond the CRPF operations, a required increase to living wage and supportive benefits to one subset of entry-level workers would likely disrupt pay equity throughout a company's operations in Oregon.

Another important factor to consider is to compare total compensation rather than keeping hourly rates and supportive benefits separate. One facility can have a lower than average hourly rate but provide a significantly above average level of supportive benefits. Ultimately, pay equity relates to the sum of these two components. These factors make calculating potential impacts complex.

F. PCRFB and CMF Phase-in Period

Oregon DEQ plans to phase the PCRFB and CMF between July 1, 2025, and January 1, 2028. The initial PCRFB and CMF will be effective starting July 1, 2025, which is when CRPFs are required to meet the initial performance standards (see Exhibit 12 for proposed capture rates) such as capture rates and combination rates. Starting January 1, 2027, the living wage and supportive benefits requirement comes into effect, which adds a new component to the fees set on July 1, 2025. Starting January 1, 2028, the higher performance standards come into effect, which further adds costs associated with the fees.

Exhibit 16 provides a summary of the how the fees will be phased in and the anticipated fee levels. The Anticipated Program Costs are applied to the costs associated with the PCRFB only, and thus, the increasing fee level for the PCRFB compared to a constant fee level for the CMF.

Exhibit 16
PCRFB and CMF Phase-in Schedule

Effective Date Range	CRPF Requirement	Anticipated PCRFB Level	Anticipated CMF Level
July 1, 2025, to December 31, 2026	Initial performance standards	\$	\$
January 1, 2027, to December 31, 2027	Living Wage and Supportive Benefits	\$\$	\$
January 1, 2028, and on	Living Wage and Supportive Benefits + Higher performance standards	\$\$\$	\$

G. Areas for Further Evaluation and Methodology for Finalizing Anticipated Program Costs

Crowe will continue work to determine anticipated program costs over the next two months. As part of this effort, we will evaluate the several areas, including but not limited to the following topics to be discussed in follow-up interviews with CRPFs:

- **Administrative and Reporting:** Obtaining detailed information where available on meeting permit administrative and reporting requirements, including additional staffing, software systems, and approaches to measuring capture and contamination rates and reporting on responsible end markets. Also, incorporating the permit and certification fees associated with operating as a CRPF.
- **Accepting and Sorting New Materials:** Identifying facility plans regarding sorting new materials such as cartons and various plastic containers in cases where they are not currently being sorted. Approaches could include adding sort line employees, adding storage bunkers, adding equipment, and/or transporting material to other CRPFs
- **Meeting Performance Standards:** Identifying facility plans regarding the need for additional equipment such as robots and optical sorters, in order to meet capture and contamination rates as of July 1, 2025, and January 1, 2028
- **Operational Changes:** Identifying any other operational changes that facilities are considering to meet RMA requirements and the potential cost implications of those changes
- **Meeting Living Wage Requirement:** Reviewing initial living wage calculations for each facility and discussing facility responses and decisions regarding staffing versus equipment purchases
- **Meeting Supportive Benefits Requirement:** Determining additional costs related to supportive benefits, as the requirements are specified. Crowe obtained baseline benefit information for employees and contract staff at each facility during the June interviews. We will utilize this information to determine additional costs required to meet future benefit needs.

To the extent possible, we will seek to obtain supporting documentation and a rationale for the approaches and costs cited by CRPF representatives. In addition to the information obtained during facility interviews, Crowe will conduct research on equipment procurement and installation costs to inform the anticipated program cost calculation. We will interview equipment manufacturers, conduct secondary research, and leverage data gathered during the initial facility site visits.

As we compile estimates of anticipated program costs, we will provide breakouts of costs in four key categories: administrative and requirements, equipment and capital investments, operational changes, and living wage and supportive benefits. In addition, we will conduct sensitivity analyses regarding the scale and scope of facility responses to provide a range of anticipated program costs to reflect several likely scenarios. We will identify specific scenarios based on our research and discussions with facilities.

6. Average Market Pricing Data and Methodology

Statute requires the processor commodity risk fee to be based on the eligible processing costs of facilities less the average commodity value of recyclable materials processed by CRPFs. DEQ is required to establish methods to determine and periodically update the average commodity value.¹⁸ As required by ORS 459A.923(2)(h) of the RMA, the methods to calculate average commodity value must include:

- The average composition of materials by percentage in each mix, multiplied by published market values
- The sources of the published market values used,
- Any adjustments to published market values for each commodity to reflect conditions in Oregon.

The overall composition of materials by percentage in each mix is being determined by DEQ's 2023 Inbound and Outbound Commingled Recycling studies, material-specific facility outbound tonnage data as reported annually to DEQ, and through internal data gathered from each CRPF. For the initial calculations we utilize the tonnage data from 2022 facility reports submitted to DEQ.¹⁹

A. Overview

Crowe provides a description of the methodology and initial results in this section. These data will be further evaluated and refined in the coming months. In developing the methodology and initial calculations, as discussed below we made a number of assumptions and also identified several issues that should be addressed as we further refine the approach:

- Initial 2022 tonnage data is based on DEQ reports of Oregon commingled recyclables from each CRPF and 2022 tonnage data as reported to Crowe by CRPFs. The DEQ and facility tonnage generally matched; when it did not, Crowe worked with the facility representatives to understand the differences and to determine the most accurate data. However, there are still some outstanding questions to resolve on tonnage data.
- There was no clear or consistent use of Other Plastic and Rigid Plastic Containers in the DEQ data. Some facilities reported under both categories, some reported under one or the other. Therefore, to determine plastic resin tonnage for purposes of the commodity pricing model, Crowe utilized the combined tonnage of both categories. We then further split apart the combined plastic total into PET, HDPE natural, HDPE color, and mixed plastic based on average splits across these resin types calculated using available facility data.
- Crowe will update and refine tonnage data as the additional Inbound and Outbound Commingled Recycling study results become available.
- CRPFs provided monthly material pricing reports for outbound bales of OCC, mixed paper (various grades), PET, HDPE natural, HDPE color, mixed plastic (of various types), tin or steel cans, and aluminum. These data reflected a wide range of prices within commodity types for several reasons:
 - Differences in quality and grade
 - Differences in timing (invoice date versus ship date)
 - Differences in end-markets (domestic versus export)
 - Differences in quantity of material shipped
 - Business relationships between facilities and buyers.

¹⁸ Per ORS 459A.923(2)(h), separate average commodity values are to be calculated for commingled materials collected from single-family residences in Oregon and from all other sources.

¹⁹ We obtained internal facility reports and, in some instances, tonnage data from internal records do not match what is reported to DEQ or a portion of the reported commingled tons were actually partially processed and sent to another facility for processing. In these instances, Crowe used internal facility reports as the most appropriate tonnage data for the study.

- Crowe utilized two different market pricing data sources, as described below. As we obtain better information on typical Oregon bale grades we will further evaluate market sources to find the best match. Note that as CRPFs may adjust their mix of outbound commodities over time and other factors such as rainfall can impact quality, there will be ongoing challenges in matching actual to published market bale prices.
- The result is that for some commodities, the average Oregon price is significantly different than the published market prices and the magnitude of these differences can be highly variable month-to-month. On an annual average basis, only paper fiber, tin and steel cans, and HDPE Natural had Oregon-specific prices within 5% of published market prices. The most significant difference is in mixed plastic, which represents less than 1% of outbound material, thus the impact is negligible.

Crowe recommends further analysis as additional Inbound and Outbound Commingled Recycling study results become available as well as after additional discussions with DEQ and the technical workgroup to resolve, to the extent possible, the issues identified above. It will be important to understand reasons for the differences between published and Oregon pricing data. We will also discuss inclusion of scrap metal, which we left out in this version of the calculation as it is often handled separately from materials on the commingled line. As we move forward with refining this methodology, Crowe will continue to look for better published pricing sources that may correlate more closely with Oregon CRPFs.

B. Scrap Price Data Sources

Crowe researched several recycled material scrap market indices in addition to obtaining market pricing data from the CRPFs. We recommend using blended market pricing data for both OCC and mixed paper, which represent the largest share of tonnage and sales revenue. In reviewing market pricing data, we considered factors such as frequency of publication, availability of region-specific data, availability of multiple materials and grades of material, consistency with material types and grades produced by Oregon CRPFs, data sources (if available), whether a subscription is required, and price. Below, we provide an overview of the two selected sources and several others that we evaluated.

- **RecyclingMarkets.net, Secondary Materials Pricing (SMP)** – This data source has been tracking commodity pricing for over 35 years and providing secondary material pricing information online since 2002. Buyers, end-users, recycling centers, and waste haulers confidentially provide pricing data to SMP and data is published weekly on Fridays. SMP reviews and analyzes weekly price reports, which are also weighted by volume. SMP aligns material grades with the Association of Plastic Recyclers (APR), Institute of Scrap Recycling Industries (ISRI), and National Association for PET Container Resources (NAPCOR). RecyclingMarkets.net is subscription based for historical data. Another advantage of SMP is that it summarizes data regionally and nationally. The Pacific Northwest region (Region 4) includes Oregon, Washington, Idaho, British Columbia, and the Yukon. Crowe has a subscription that covers both fiber and container pricing which currently costs \$465 per year. <https://www.recyclingmarkets.net/secondarymaterials/prices.html?cid=3&city=Pacific+Northwest#prices>.
- **Waste Paper Composite Index (part of Secondary Commodity Composite Index)** – The index tracks paper recycling and recovered paper fiber markets, providing an overall index and baled price data for hard white, kraft, mixed, OCC, ONP, and SOP (sorted office paper). The index is derived from current spot market prices originating from the Inter-Continental Paper Exchange (IPE), a proprietary data source that “may not reflect external market trends”. Crowe purchased a one-month subscription to evaluate this index. It appears to be closer to Oregon pricing for OCC, although pricing diverted in the latter half of the year. Crowe will continue to evaluate this index, in combination with SMP. The waste paper subscription is \$35 per month or \$350 for a year.

Other Scrap Pricing Indices Evaluated

- **Fastmarkets** provides pricing data for agriculture, metals and mining, energy, and forest products including a wide range of recovered paper grades and scrap ferrous and non-ferrous grades. Fastmarkets does not offer any pricing data on recycled plastic commodities, however. Fastmarkets is a large, global company that has acquired a number of smaller, independent pricing data suppliers over the years, including Pulp and Paper Week, formerly affiliated with RISI, which is the source of recovered fiber data. They offer limited pricing for the US Pacific region but nothing specific to Oregon or the Northwest. Fastmarkets prefers to work with large organizations with high-volume data needs and was reticent to provide a quote for limited data sets, and without knowing the exact number of users and ultimate customer. Crowe was given a quote of \$5,000 per sequence on a conditional basis, with limited users and time duration. For four separate commodities, for example, the price would be \$20,000 for the limited access. Given the high price, global market focus, and lack of Northwest specific pricing and plastics pricing, Crowe does not recommend this source. A few facility representatives noted that they have historically reviewed the Pulp and Paper International (PPI) as a reference to track trends (not specific prices), which we believe was historically part of Pulp and Paper Week's pricing newsletter. <https://www.fastmarkets.com/forest-products/recovered-paper>.
- **ScrapIndex.com** is a service of recycle.net. Data is generated from internal proprietary data from The Recycler's Exchange and Recycling Offset Credits (ROCs) reports. ScrapIndex.com includes prices for a broader range of recyclables including automobiles, batteries, iron and steel, exotic metals, rubber, and textiles in addition to waste paper, plastics, and glass. Subscriptions must be purchased for single materials, for example PET, for \$25 per month or \$250 per year. Given the potential duplication with SMP, lack of regional data, requirement to purchase individual materials, and higher cost, we do not recommend ScrapIndex.com.
- **Secondary Commodity Composite Index** (<https://www.secondarycommodity.com/>) tracks changing market prices across eleven sectors including scrap metals, exotic and precious scrap, waste paper (see above), plastic electronics, curbside recycling, and others. Data is derived from current spot market prices from a network of on-line exchanges. The web page notes that the source of data is proprietary in nature and may not reflect external market trends. The index does include a curbside recycling composite index which is a weighted basket of nine benchmark grades of scrap curbside materials (HDPE, OCC, ONP, PET, scrap glass, single stream minus glass, single stream plus glass, steel cans, and UBC). The curbside composite index provides a blended index and individual commodity process for loose material, which is not consistent with CRPF operations. The curbside composite subscription is \$35 per month or \$350 for a year. The recycled plastics subscription is \$125 per month or \$1,250 per year. The scrap metals subscription is \$200 per month or \$2,000 per year.
- **Resource Recycling** provides monthly pricing information in their free email and print publications. The data is summarized by RecyclingMarkets.net staff, thus is duplicative and less thorough than the original SMP data. <https://resource-recycling.com/recycling/2023/07/10/prices-drop-40-for-two-key-recycled-plastic-grades/>.
- **Plastics News** provides recycled plastics pricing as part of their annual subscription (\$169 per year). However, pricing data is for flakes and pellets rather than baled recyclables <https://www.plasticsnews.com/resin-prices/north-america#recycled-plastics>.

C. Average Commodity Value Methodology

The calculation of average commodity value (ACV) involves two components: (1) an initial calculation to determine the percent differential between published market data and Oregon-specific data and (2) the monthly calculation to determine the average commodity value for purposes of the PCRf.

Calculation of Oregon Specific Average Commodity Value Differential

As illustrated in **Exhibit 17**, the initial determination of the average commodity value methodology was a multi-step process. DEQ will utilize the resulting differential, 2.77%, for calculation of the monthly average commodity value. DEQ will apply this percentage to market average commodity values in determining the monthly PCRf payments. This percentage may need to be adjusted in the future if there are significant changes in share of outbound commodities. **Exhibit 18** provides additional descriptions for each of the 13 steps. **Exhibit 19** provides an example of the calculation of the Oregon price adjustment. **Exhibit 20** illustrates the calculation of the Oregon price adjustment of 2.77%.

Monthly Calculation of Oregon Specific Average Commodity Value

On a monthly basis, DEQ will utilize the sources identified to determine the published average commodity value. This calculation, illustrated in **Exhibit 21**, determines the ACV to be used in determining the monthly PCRf payments. DEQ will multiply the weighted average per ton market commodity price by the Oregon-specific differential of 2.77% to determine the Oregon specific ACV for a given month.

Exhibit 17**Overview of Initial Oregon-Specific Average Commodity Value Differential**

1. Compiled selected scrap market data for 2022 for the selected commodities (OCC, mixed paper (various grades), PET, HDPE Natural, HDPE color, mixed plastic (various mixes), aluminum cans, tin and/or steel cans)
2. Compiled monthly scrap data from CRPFs for the selected commodities
3. Evaluated DEQ 2022 material-specific tonnage data and determine percent of total for each facility, by commodity
4. For plastics, utilized resin-specific split from selected facilities to separate DEQ plastic tonnage data
5. Determine percent of total 2022 outbound tons for each material type based on DEQ data; For plastics, utilize resin-specific split from selected facilities to separate DEQ plastic tonnage
6. Determine the market data commodity price for the target month (August 2023) for each commodity
7. Determine a weighted average market data commodity price for the target month
8. Determined a weighted average Oregon price for each month for each commodity
9. Calculate an annual Oregon-specific differential between the market price data and the weighted average Oregon price for 2022
10. Multiply the current source market price by the Oregon adjustment factor for each commodity
11. Multiply the percent of outbound tons by the Oregon price to determine a pro-rated tonnage price
12. Sum the pro-rated tonnage prices to determine an Oregon specific price per ton of commingled recyclables
13. Calculate the overall differential between the Oregon ACV and the market data ACV (currently 2.77%)

Exhibit 18
Description of Initial Oregon-Specific Average Commodity Value Differential and Considerations for Each Step

Process Step	Considerations
1. Compiled selected scrap market data for 2022 for the selected commodities (OCC, mixed paper (various grades), PET, HDPE Natural, HDPE color, mixed plastic (various mixes), aluminum cans, tin and/or steel cans)	Crowe researched scrap market sources as described above and identified two sources. For purposes of comparison with facility data we determined average monthly scrap prices. Where there were multiple grades and/or sources, we calculated a simple average of market data.
2. Compiled monthly scrap data from CRPFs for the selected commodities	Facilities provided an average per ton price for the commodities sold each month. Some facilities provided more detail on specific commodities and end-markets (export versus domestic), although often the data was aggregated into an overall price per ton.
3. Evaluated DEQ 2022 material-specific tonnage data and determine percent of total for each facility, by commodity	Crowe compiled and analyzed the DEQ 2022 commingled recycling facility outbound data to determine overall percent of total by material type and percent of total by material type for each facility. We compared and reconciled this data with tonnage data provided by the facilities.
4. For plastics, utilized resin-specific split from selected facilities to separate DEQ plastic tonnage data	DEQ's tonnage data combined plastic resins and was not used consistently by the facilities. We leveraged facility-provided data broken out by resin type to determine an average tonnage for PET, HDPE natural, HDPE color, and mixed plastic. Facilities did not consistently report mixed plastics. The mix of outbound plastics by resin will need to be refined as Outbound Commingled Recycling study results are available.
5. Determine percent of total 2022 outbound tons for each material type based on DEQ data; For plastics, utilize resin-specific split from selected facilities to separate DEQ plastic tonnage	Crowe utilized the 2022 DEQ tonnage data, as validated with facility data, to determine the percent of total 2022 outbound tons for each material type. We utilized these percentages to calculate the weighted average bale prices. These data will be updated from the results of the Outbound Commingled Recycling study.
6. Determine the market data commodity price for the target month (August 2023) for each commodity	Crowe identified or determined market prices for each commodity for August 2023 based on the identified sources (recyclingmarkets.net and Waste Composite Index for baled OCC, mixed paper, and sorted office papers).
7. Determine a weighted average market data commodity price for the target month	Crowe utilized the percent of total 2022 outbound tons for each material type multiplied by the August 2023 market commodity price to determine an average market commodity price for comparison purposes. This average market commodity price as shown in the next exhibit is \$65.67
8. Determined a weighted average Oregon price for each month for each commodity	Crowe utilized the facility-specific pricing data and percent of annual tonnage data for each facility to determine a weighted average price for each commodity for each month. Using this methodology, we weighted the price of facilities with a higher proportion of tonnage more heavily than a facility with only a small share of total annual tons of that commodity.

Process Step	Considerations
9. Calculate an annual Oregon-specific differential between the market price data and the weighted average Oregon price for 2022	Crowe computed a simple average of the monthly market prices and a simple average of the weighted average Oregon specific monthly prices to determine average annual prices for 2022. We then determined the difference between the market data and Oregon pricing. As noted above, these differentials were in some cases very high, particularly on a month-to-month basis, and will require further validation.
10. Multiply the current source market price by the Oregon adjustment factor for each commodity	This calculation determines the Oregon specific price per ton for the selected time period. In this example, we utilized August 2023 market data.
11. Multiply the percent of outbound tons by the Oregon price to determine a pro-rated tonnage price	This calculation determines the contribution to the total price per ton for each commodity type. In the example, OCC contributes \$23.41 to the total value of a ton of commingled recyclables (\$67.49).
12. Sum the pro-rated tonnage prices to determine an Oregon specific price per ton of commingled recyclables	The final result is a per-ton price for Oregon commingled recyclables. Based on August 2023 market prices and the current iteration of the model, the blended price per ton is \$67.49.
13. Calculate the differential between the Oregon ACV and the market data ACV	This calculation $(\text{Oregon price} - \text{market price}) / \text{market price}$ determines the percent differential to apply to market data for purposes of calculating the monthly ACV. The percent difference is 2.77%. For an average market data price of \$100.00 per ton, the Oregon ACV would be \$102.77.

Exhibit 19
Example Calculation of Market Data and Oregon-Specific Scrap Prices for HDPE Natural (dollars per ton)

Month (2022)	HDPE Natural Bale Price, Northwest, recyclingmarket.net	Oregon Weighted Average HDPE Natural Bale Price	Percent Difference (Oregon as compared to Market Data)
January	\$945	\$798	-15.6%
February	903	886	-1.9%
March	850	995	17.1%
April	906	1,026	13.3%
May	975	1,010	3.6%
June	1,050	1,221	16.2%
July	950	1,001	5.4%
August	880	824	-6.4%
September	730	744	1.9%
October	765	789	3.1%
November	987	1,037	5.1%
December	1,020	1,068	4.7%
Annual Average	\$913	\$950	4.0%

Exhibit 20
Example Calculation of Oregon Specific Price per Ton for Commingled Recyclables (dollars per ton)

Material	Total Outbound Tons (2022) ²⁰	Percent of Tons (2022)	Source Market Price August 2023	Weighted Average Market Price	Adjustment Between Market and Average Oregon Price ²¹	Calculated Oregon Price	Ton Price Share (Percent of Tons × Oregon Price)	Source Market Price Description/Calculation
Cardboard (OCC)	140,319	54.3%	\$37.50	20.35	15.0%	\$43.14	\$23.41	Blended average between recyclingmarkets.net* OCC PS11 and Waste Composite baled OCC.
Paper Fiber (FIB)	92,645	35.8%	\$49.32	17.67	2.9%	\$50.73	\$18.18	Blended average between recyclingmarkets.net PS54 and PS56 and Waste Composite baled mixed paper and baled sorted office papers.
PET	9,170	3.5%	\$130.00	4.61	25.4%	\$162.99	\$5.78	Recyclingmarkets.net baled PET picked up.
HDPE Natural	3,413	1.3%	\$498.33	6.58	4.0%	\$518.27	\$6.84	Recyclingmarkets.net baled HDPE Natural picked up.
HDPE Color	5,474	2.1%	\$91.67	1.94	35.8%	\$124.46	\$2.63	Recyclingmarkets.net baled HDPE Color picked up.
Mixed Plastic	1,193	0.5%	-\$36.67	-0.17	-152.2%	\$19.13	\$0.09	Recyclingmarkets.net baled #3-#7 baled, picked up.
Tin/Steel Cans (TC)	4,051	1.6%	\$225.00	3.53	-1.4%	\$221.94	\$3.48	Recyclingmarkets.net steel cans, sorted, baled, picked up.
Aluminum (AL)	2,310	0.9%	\$1,250.00	11.16	-36.6%	\$792.36	\$7.08	Recyclingmarkets.net aluminum cans, sorted, baled, picked up.
Total	258,575	100.0%		\$65.67	2.77%		\$67.49	

* All Recyclingmarkets.net prices are for the Pacific Northwest.

²⁰ Excludes residual tonnage: disposal, glass, scrap metal, and plastic film

²¹ Calculated based on an annual Oregon-specific differential between the selected market prices and weighted average Oregon price for 2022. This differential serves as the adjustment factor between Oregon-specific market prices and Oregon market prices

Exhibit 21

Example Calculation of Monthly Market Price Commodity Value and Oregon Average Commodity Value (dollars per ton)

Material	Total Outbound Tons (2022) ²²	Percent of Tons (2022)	Source Market Price August 2023	Weighted Average Market Price	Adjustment Between Market and Average Oregon Price	Calculated Oregon Price	Source Market Price Description/Calculation
Cardboard (OCC)	140,319	54.3%	\$37.50	20.35			Blended average between recyclingmarkets.net* OCC PS11 and Waste Composite baled OCC.
Paper Fiber (FIB)	92,645	35.8%	\$49.32	17.67			Blended average between recyclingmarkets.net PS54 and PS56 and Waste Composite baled mixed paper and baled sorted office papers.
PET	9,170	3.5%	\$130.00	4.61			Recyclingmarkets.net baled PET picked up.
HDPE Natural	3,413	1.3%	\$498.33	6.58			Recyclingmarkets.net baled HDPE Natural picked up.
HDPE Color	5,474	2.1%	\$91.67	1.94			Recyclingmarkets.net baled HDPE Color picked up.
Mixed Plastic	1,193	0.5%	-\$36.67	-0.17			Recyclingmarkets.net baled #3-#7 baled, picked up.
Tin/Steel Cans (TC)	4,051	1.6%	\$225.00	3.53			Recyclingmarkets.net steel cans, sorted, baled, picked up.
Aluminum (AL)	2,310	0.9%	\$1,250.00	11.16			Recyclingmarkets.net aluminum cans, sorted, baled, picked up.
Total	258,575	100.0%		\$65.67	2.77%	\$67.49	

* All Recyclingmarkets.net prices are for the Pacific Northwest.

²² Excludes residual tonnage: disposal, glass, scrap metal, and plastic film

7. Annual Adjustment Methodologies for Consideration

There will be a three-year gap between the cost data Crowe utilizes to determine the PCRf and CMF and when the fees are first paid (2022 to 2025). The RMA provides for the fees to be determined by similar study at least once every five years and no more than once every year. There is also a provision that if a study demonstrates that the average per-ton eligible processing cost has changed by more than 10 percent since the commission last established the PCRf, the commission shall by rule review the PCRf.

During the interim, any separate process to update the fee between studies must be clearly defined and documented in the rulemaking process. As part of this study, Crowe will examine two potential approaches to updating processing costs and costs of removing and disposing of contaminants outside of completing an entirely new study and undertaking a new rulemaking. The first is to simply apply a cost-of-living adjustment (COLA), the second is a more comprehensive adjustment methodology utilizing data from the study and published economic indicators. These adjustments could occur annually or at another predetermined interval, for example every two years.

Below, we provide example calculations of the two approaches. We will work with the DEQ to determine whether to incorporate an adjustment methodology into the rulemaking. Should DEQ decide to move forward with an adjustment, Crowe recommends applying a COLA in the near term and to consider a more comprehensive category-based adjustment in the future. While CRPFs are in the midst of making investments in technology, adding staff, and reducing staff, the spread of costs across the 15 cost categories is likely to change. For example, the labor percentage could decrease while interest, depreciation, and maintenance could increase. In addition, the living wage and supportive benefits requirement, although not in place until January 1, 2027, will alter the percentages across categories. Thus, the category percentages we have calculated in this study of 2022 costs are not likely to be representative of the category percentages over the next two to three years.

1. Application of a Cost-of-Living Adjustment (COLA)

Utilizing a COLA to yearly adjust fees and payments is standard across many programs. California applies a COLA to the cost of recycling to determine processing payments and applies a COLA to handling fees paid to recyclers. This provides a mechanism to adjust the cost of recycling that is measured two years before the payment is applied (costs of recycling in 2022 will inform recycler payments in 2024). **Exhibit 22** provides the CPI (CPI-U, Western Region) for the last 10 years, between 2013 and 2022. Below provides a hypothetical example over four years, with adjustments starting at Year 2. This example shows how a COLA adjustment using CPI could be implemented. For purposes of illustration, we use a projected 3.1% annual adjustment consistent with the living wage calculation.

Exhibit 22
Consumer Price Index (CPI-U) Western Region
2013 to 2022

Year	Annual Index	YoY %Δ	Cumulative %Δ
2013	235.824		
2014	240.215	1.9%	1.9%
2015	243.015	1.2%	3.0%
2016	247.705	1.9%	5.0%
2017	254.738	2.8%	8.0%
2018	263.263	3.3%	11.6%
2019	270.350	2.7%	14.6%
2020	275.057	1.7%	16.6%
2021	287.494	4.5%	21.9%
2022	310.509	8.0%	31.7%
Ave		3.1%	

Source: U.S. Bureau of Labor Statistics, Series ID – CUUR0400SA0

Hypothetical COLA Adjustment using CPI-U:

- **Year 1 (2022, Survey Year) Cost per Ton Results (with Profit)**
 = \$134 per ton
- **Year 2 (2023) Adjustment**
 Year 1 Cost per Ton * (1 + % Δ CPI between 2022 and 2023)
 = \$134 per ton * (1 + 3.1%) = \$138.15 per ton
- **Year 3 (2024) Adjustment**
 Year 2 Cost per Ton * (1 + % Δ CPI between 2023 and 2024)
 = \$138.15 per ton * (1 + 3.1%) = \$142.43 per ton
- **Year 4 (2025) Adjustment**
 Year 3 Cost per Ton * (1 + % Δ CPI between 2024 and 2025)
 = \$142.43 per ton * (1 + 3.1%) = \$146.85 per ton

2. Category-Specific Adjustment Methodology

A second approach to adjusting the fees to account for the lag between study periods and fee implementation is to leverage study data on the costs of processing (or contamination). Within our cost model, we have classified facility costs into one of 15 categories. Crowe’s work on prior recycling cost surveys in California, Hawaii and for carpet recycling has demonstrated that the split of costs across categories is generally consistent based on the type of recycling facility. For example, labor (employee wages and temporary labor) typically accounts for approximately 50% of total costs in a “traditional recycler”. For CRPFs, labor-related costs are still the highest percentage, but closer to one-third of total costs. Given that CRPFs utilize more equipment, it is reasonable that depreciation, maintenance, and interest categories are higher and labor is lower.

This proposed adjustment methodology would leverage category costs, standard metrics in a few key categories, and a COLA (using CPI) to more precisely adjust costs to reflect current time periods. Crowe developed a model utilizing this methodology for the State of Hawaii’s Deposit Beverage Container Program (HI5) handling fee payment. **Exhibit 23** provides an example of how this approach would work. We multiply each average percent of category costs by the relevant published indicator to determine an adjusted percentage. In this example, the adjustments result in an increase. If the calculated processing cost with profit was \$134 per ton, the updated cost would be $\$134 \times 105.6\% = \141.50 .

Exhibit 23
Illustration of Category-Specific Adjustment Methodology

Category	Average Percent of Costs	Example Adjustment Indicator (Annual Percentage Change)	Hypothetical Indicator	Adjusted Percentage
Direct labor	31%	Quarterly census of employment and wages (or living wage requirements)	4%	$31\% \times (1 + 4\%) = 32.2\%$
Indirect labor	10%	Average cost of health insurance data	10%	$10\% \times (1 + 10\%) = 11.0\%$
Transportation	13%	Weekly West Coast No. 2 Diesel Retail Prices	15%	$13\% \times (1 + 15\%) = 15.0\%$
All other costs	46%	COLA (CPI)	3%	$46\% \times (1 + 3\%) = 47.4\%$
Total	100%			105.6%

Appendix A: Recycling Modernization Act – ORS 459A.920 and 459A.923

Exhibit 24

Text from ORS 459A.920 and .923 of the Recycling Modernization Act

ORS 459A.920. Contamination management fee. (1) The Environmental Quality Commission shall by rule adopt and periodically revise a contamination management fee to be paid by producer responsibility organizations to commingled recycling processing facilities to compensate the facilities for the costs of removing and disposing covered products that are contaminants. The amount of the fee shall be based on the result of the study conducted under subsection (2) of this section. Rules adopted under this section must:

(a) Provide that payment of the fee may not be required more frequently than once per month and must be paid within 45 days of a request for payment;

(b) Provide that the fee may not be based on commingled recycling originating outside of Oregon; and

(c) Establish a review process to ensure that the fee is appropriately charged.

(2) The Department of Environmental Quality shall contract with an independent organization to conduct the study under this subsection. The study must:

(a) Estimate the cost to commingled recycling processing facilities of removing and disposing of covered products that are contaminants, reported as the cost per ton of covered products; and

(b) Estimate the costs to commingled recycling processing facilities of removing and disposing of all contaminants, reported as the cost per ton of all contaminants.

(3) A commingled recycling processing facility that does not participate in the review process described in subsection (1) of this section or the study described in subsection (2) of this section is not eligible to receive a contamination management fee.

(4) Any proprietary information provided to the department under subsection (1) of this section or to a person conducting a study under subsection (2) of this section may be designated confidential by a commingled recycling processing facility. Information designated confidential is not subject to public disclosure under ORS 192.311 to 192.478, except that information may be disclosed as summarized or aggregated data if doing so does not directly or indirectly disclose the proprietary information of any specific facility.

(5) The department shall review the contamination management fee at least once every five years. The department may not review the contamination management fee more frequently than once per year.

ORS 459A.923. Processor commodity risk fee. (1) As used in this section:

(a) “Anticipated program cost” means all additional costs related to any new requirements of sections 1 to 43 of this 2021 Act that are anticipated prior to the next review of the processor commodity risk fee under subsection (6) of this section.

(b) “Average commodity value” means the average revenue paid by brokers or end markets, after processing by a commingled recycling processing facility, for a composite ton of commingled material collected for recycling in Oregon.

(c)(A) “Eligible processing cost” means all costs associated with owning and operating a commingled recycling processing facility as determined by the study conducted under subsection

(3) of this section, including but not limited to sorting, handling, storing, disposal, marketing and shipping, administration, rent, fees, depreciation, fixed costs, profit, the target price paid for commingled recycling collected from Oregon as described in subsection

(2)(d) of this section and anticipated program costs.

(B) “Eligible processing cost” does not include revenue from the sale of recyclables and any costs that are reimbursed by producer responsibility organizations or other parties, including the contamination management fee established under section 24 of this 2021 Act.

(2) The Environmental Quality Commission shall by rule adopt and periodically revise a processor commodity risk fee to be paid by producer responsibility organizations to commingled recycling processing facilities to ensure that producers share in the costs of fully processing commingled recyclables that are covered products and to allow local governments to reduce the financial impacts on ratepayers. The processor commodity risk fee shall be based on the eligible processing costs of facilities less the average commodity value of recyclable materials processed by facilities. Rules adopted under this section must:

(a) Provide that payment of the fee may not be required more frequently than once per month and must be paid within 45 days of a request for payment.

(b) Provide that the fee may not be based on commingled recycling originating outside of Oregon.

(c) Establish a review process to ensure that the fee is appropriately charged.

(d) For purposes of calculating the processor commodity risk fee, allow the average fee charged by commingled recycling processing facilities for acceptance of commingled recyclables collected from Oregon to target a price of \$0 per ton, expressed on the basis of compensation per ton of delivered material.

(e) Provide that the fee is to be paid on the basis of recyclable material received by or sold from a commingled recycling processing facility.

(f) Ensure that materials handled by more than one commingled recycling processing facility are not double counted for purposes of calculating the fee.

(g) Allow local governments to protect ratepayers from cost increases associated with the volatility of commodity markets.

(h) Establish methods to determine and periodically update, but no more frequently than once per month, the average commodity value per ton of commingled materials collected from single-family residences in Oregon and from all other sources in Oregon. The methods developed under this paragraph must include:

(A) The average composition of materials by percentage in each mix, multiplied by published market values;

(B) The sources of the published market values used; and

(C) Any adjustments to published market values for each commodity to reflect conditions in Oregon.

(3) Subject to subsection (6) of this section, the Department of Environmental Quality shall contract with an independent organization to conduct the study under this subsection. The study must:

(a) Estimate the average eligible processing cost at commingled recycling facilities that process commingled recycling generated in Oregon; and

(b) Report the costs on the basis of tons of commingled recycling received and materials shipped to end markets.

(4) A commingled recycling facility that does not participate in the review process described in subsection (2) of this section or the study described in subsection (3) of this section is not eligible to receive a processor commodity risk fee.

(5) Any proprietary information provided to the department under subsection (2) of this section or to a person conducting a study under subsection (3) of this section may be designated confidential by a commingled recycling processing facility. Information designated confidential is not subject to public disclosure under ORS 192.311 to 192.478, except that information may be disclosed as summarized or aggregated data if doing so does not directly or indirectly disclose the proprietary information of any specific facility.

(6) The department shall contract for the study under subsection (3) of this section to be performed at least once every five years. The department may contract for the study under subsection (3) of this section to be performed no more than once per year. If a study under subsection (3) of this section demonstrates that the average per-ton eligible processing cost has changed by more than 10 percent since the commission last established the processor commodity risk fee, the commission shall by rule revise the processor commodity risk fee.

Appendix B: Anticipated Program Costs

This Appendix describes Crowe's Anticipated Program Cost methodology. ORS 459A.923(1)(a) defines Anticipated Program Costs as "all additional costs related to any new requirements of sections 1 to 43 of this 2021 Act that are anticipated prior to the next review of the processor commodity risk fee". There are significant unknowns related to anticipated program costs. First, many of the requirements are not yet formally defined. Many of the requirements are currently under active discussion as part of proposing performance standards and other permit conditions as part of rule concept development. As a result, there will be some give-and-take between development of permit rules and estimation of anticipated program costs. This will be an iterative process and will include scenarios or options reflecting potential performance standards, permit conditions, and differing levels of capital investment. Another uncertainty is that there is no set date for the next review of the Processor Commodity Risk Fee (PCRF), other than within the next five years (although likely this review would be sooner).

Crowe will prepare and ask a series of questions related to categories of anticipated program costs during the facility visits. In addition, we will conduct follow-up telephone interviews with commingled recycling processing facilities (CRPFs) in late 2023 to identify anticipated program costs that may be identified as the rulemaking requirements are further defined (e.g., defining living wage and supportive benefits for CRPF workers and permit standards). Anticipated costs could include, but are not limited to, the following:

- Administrative and reporting requirements necessary to comply with permits, including disposition reporting and responsible end market standards
- Operational changes necessary to add sorting capability for materials listed on the Uniform Statewide Collection List
- Quality enhancements necessary to comply with permit requirements including costs associated with:
 - Re-running material through the sort line
 - Adding employees (or reducing employees)
 - Equipment
 - Capacity expansions
- Cost estimations to satisfy contamination standards ultimately established during the rulemaking process (which may vary by bale type, e.g., 5%, 2%)
- Cost estimates to satisfy the capture rates standards ultimately established during the rulemaking process.
- Living wage and supportive benefits requirement, though requirement does not take effect until January 1, 2027.
- Potential changes to material disposition, such as eschewing existing end markets that may not meet future standards for "responsible end markets" and/or sending partially-processed materials on to another commingled recycling processing facility (or other entity) for secondary processing.

A. Approach

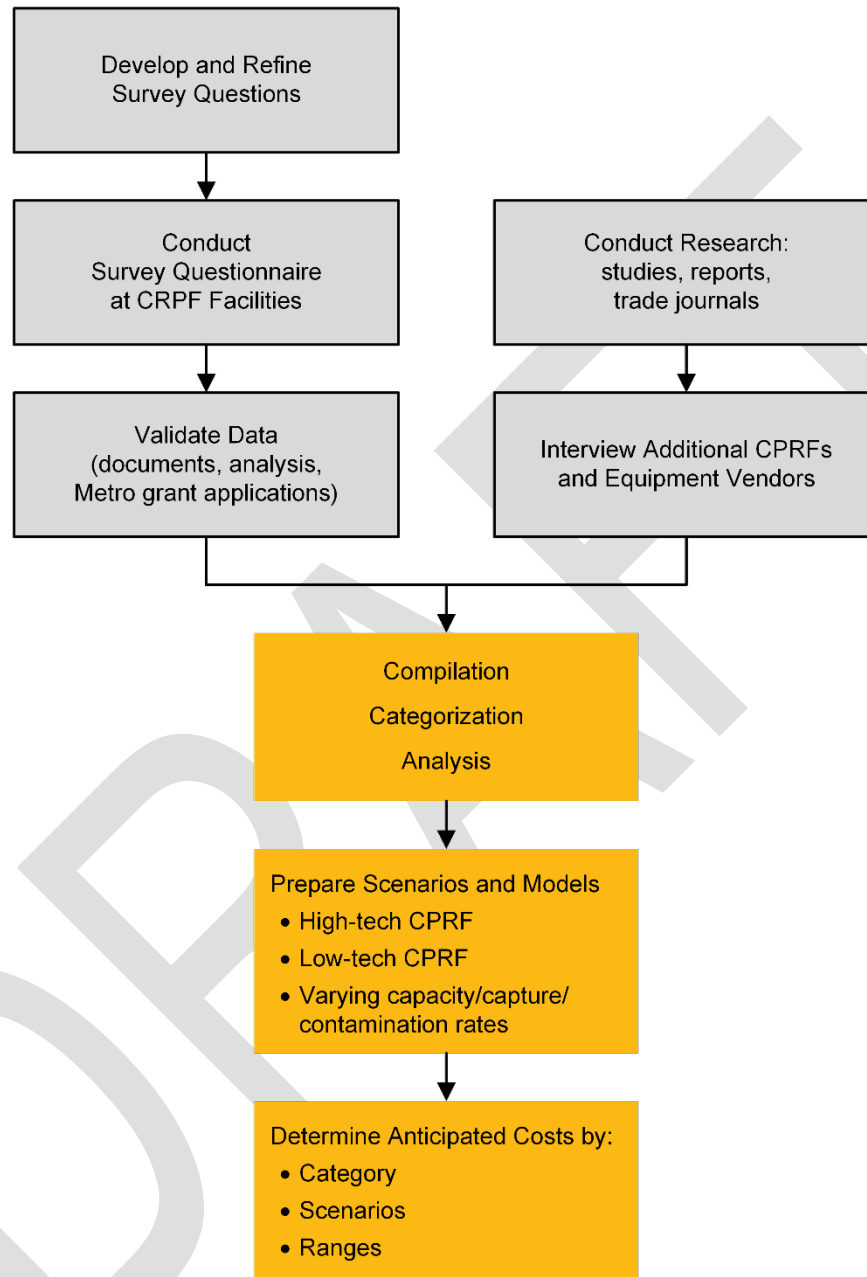
Crowe's approach to identifying anticipated program costs for CRPFs will include the following activities:

- Development of a questionnaire to be completed during the CRPF facility visits. The questionnaire, provided below, will include the following categories:
 - Administration and reporting
 - Living wage and supportive benefits
 - Employment changes
 - Equipment updates
 - Operational/quality changes
 - Capacity and material acceptances changes
- Validation of survey data
- Research on facility upgrades and equipment prices through:
 - Existing studies and reports
 - Trade literature
 - Equipment vendors
 - Interviews with out-of-state processors (beyond the Oregon CRPFs)
- Follow-up meetings with CRPFs in Fall 2023
- Compilation and categorization of survey data
- Development of models and scenarios that depict high-tech and low-tech approaches to upgrading facilities
- Presentation of aggregated results across RMA cost categories, Crowe's methodology categories, and separately for high-tech and low-tech scenarios.

Exhibit 25 provides an overview of Crowe's approach to conducting the anticipated program costs activities. In conducting this work, our overall goal is to be:

- Comprehensive in capturing and evaluating a wide range of costs and cost trade-offs
- Transparent in describing our methodology, data inputs, categories, scenarios, and assumptions
- Consistent in following our general methodological approach and categorization of costs
- Conservative in determining the minimum costs required to meet proposed RMA requirements and/or scenarios
- Focused on capturing costs supported by documentation, where possible (e.g., equipment price quotes)
- Distinguishing anticipated costs required to comply with the RMA from costs that a CRPF would otherwise have to incur to run its business absent the RMA.

Exhibit 25
Overview of Anticipated Program Costs Methodology



Crowe will present anticipated program costs in several categories. First, we will determine total anticipated program costs across each of the broad RMA areas outlined above (administration/reporting, living wage and supportive benefits, capacity/material acceptance, and capture rates/contamination rates). Utilizing this approach will more easily allow for updates to any of these categories as rulemaking proceeds. The second set of categories will align with the 15 cost categories described in our methodology. The cost categories most likely to apply for the anticipated cost analysis are:

- Direct labor
- All other labor/overhead
- General business overhead²³
- Depreciation
- Disposal
- Supplies; and
- Maintenance.

Where it is possible without revealing proprietary information, Crowe will summarize the current and planned capabilities of Oregon's CRPFs related to sorting capabilities, degree of automation, and capacity.

B. Anticipated Program Costs Survey

As a component of each CRPF facility site visit, Crowe conducted a survey to identify potential anticipated program costs. Crowe followed the same confidentiality procedures with anticipated program costs as with facility cost and associated data provided during this study. The remainder of this section provides the anticipated program costs survey. We completed the anticipated program cost survey with the CRPF after we conducted the site tour and reviewed financial and labor information. At this point, we had a good understanding of the facility's operations and ability to meet future performance standards. The first two questions framed the conversation and allowed our team to focus questions on the types of anticipated costs most applicable to each CRPF. For example, if a facility stated that they will not be upgrading equipment in response to question #2, we did not ask the questions related to new equipment.

In order to target the quality levels that will be required for permit compliance, we started with two assumptions: a 5% or a 2% outbound contamination rate on average (for all materials combined), with corresponding capture rates that support the facility meeting the 5% or 2% targets.²⁴ Should a different contamination rate be determined during the rulemaking process, Crowe will reach out to reevaluate the estimates CRPFs provide. We expect that we will be following up with each CRPF to further discuss anticipated costs in the Fall of 2023.

Exhibit 26 provides the initial anticipated program costs survey. It is important to emphasize that Crowe understands and expects that the initial responses to these questions will be just that, initial responses, and estimates. Responses to this survey provided a starting point for the iterative process that will unfold over the remainder of 2023.

²³ We will compute an overhead rate based on current costs and apply an overhead percentage as other costs change.

²⁴ There is ongoing discussion around outbound contamination rate targets to be incorporated into performance standards. Proposals under discussion include, but are not limited to 5%, APR or ISRI Grade A, a 20% improvement over ISRI or APR standards, and commodity specific versus average rates.

**Exhibit 26
Anticipated Program Costs Survey**

Section	Question No.	Question
1. Primary Concerns	1a	What are your primary concerns in meeting new requirements for Materials accepted?
	1b	Capture rates?
	1c	Contamination rates?
	1d	Living wage and supportive benefits?
	1e	Other requirements of the RMA?
2. Considerations Meeting RMA Requirements	2a	What are your facility's considerations related to meeting the RMA requirements through: Moving materials to another CRPF?
	2b	Adding employees?
	2c	Adding equipment/technology? What documentation do you have related to future equipment purchases (quotes, plans, proposals, etc.)?
	2d	Other?
3. Administration and Reporting	3a	How much time does your facility currently spend on reporting to Oregon DEQ? To Metro (if applicable)?
	3b	Of that time, how much time is spent on tonnage reporting?
	4	Are there any other reporting categories you currently report on? If yes, please specify and provide the amount of time spent on each.
	5a	How much additional labor cost or other expenses do you anticipate incurring for administration and reporting for permit /certification compliance?
	5b	Reporting related to the living wage and supportive benefits wage compliance?
	5c	Responsible end-market compliance?
	5d	Tonnage and contamination reporting?
	5e	Participation in audits and inspections?
	5f	Fee invoicing?
5g	Other (please specify)?	
4. Living Wage and Supportive Benefits	6	PTO - How many days of paid time off (including holidays, sick days, and vacation) are provided to workers in a year?
	7a	Does your facility provide health benefits? (If yes, provide specifics on premium levels, co-pays, deductibles)
	7b	Dental benefits? (Yes/No)
	7c	Vision benefits? (Yes/No)
	7d	Retirement benefits? (Yes/No)
	7e	Training and education benefits? (Yes/No)
	7f	Other benefits? (Yes/No, please specify)
	8	Estimate the total annual cost per employee for all benefits provided by your facility. Provide by employee category or job classification if there are differences.
	9	Estimate the current average percentage that benefits represent of salaries and wages by worker category.
	10	Do you expect an increase in temporary agency staffing use and related administration fees? If yes, how are benefits calculated for these temporary laborers? Will their benefits increase? How will temporary agency fees be increased?
	11	Have you considered wage compression implications? If yes, describe how they will impact your labor costs across all employees, on average, using a hypothetical 25% increase from current entry-level rates (e.g., \$20/hour to \$25/hour).

Section	Question No.	Question
5. Capacity and Material Acceptance	12	What changes will be required to accept additional materials as part of the Uniform Statewide Collection List (USCL), as currently proposed?
	13	What is your current daily capacity in tons per day (all materials combined)? Please provide documentation.
	14	Can you provide documentation of any planned capacity increases?
	15	What are the reasons for any planned capacity increases?
6. Current Quality Levels	16	What is your current average bale contamination rate (all materials combined)? Please provide documentation. Please provide average contamination rates for each commodity (OCC, mixed paper, HDPE (natural/color), PET, tin/steel, aluminum, etc.)
7. Operational Changes	17	Are you planning additional sorting procedures? If yes, will they be primarily manual or automated?
	18	What other procedural changes do you anticipate?
	19	What changes do you expect in the number of employees due to reductions from automation?
	20	What changes do you expect in the number of employees due to increases in manual labor needs?
	21	How do you expect your residual/ disposal costs to change due to higher quality outputs?
8. Equipment Changes	22	Are you planning to invest in new equipment to meet the materials on the USCL and/or performance standards starting July 1, 2025 (assume 5% and 2% contamination rates)? If yes, please identify the types and quoted prices for each equipment.
	23	Are you planning to apply for grants (matching or otherwise) from Metro, Carton Council, or other organizations for new equipment?
	24	If new equipment is being or will be purchased, do you plan to perform facility upgrades to incorporate the new equipment? If yes, describe the upgrades needed and estimated costs. Provide quotes if possible.
	25	Are there any staffing changes which would result from adding new/upgraded equipment?
	26	If certain processes will be automated, how do you anticipate reallocation of resources with automation?
	27	Will equipment maintenance costs be impacted? If yes, provide an estimate of the additional costs or cost savings.
	28	If new equipment is being purchased, does it require ongoing subscription costs (for example, monthly software/support for advanced equipment)? If yes, provide an estimate of how much monthly costs would be.