Report to the Joint Standing Committee on Environment and Natural Resources
131st Legislature, Second Session

Maine Materials Management Plan:

2024 State Waste Management and Recycling Plan Update and 2022 Waste Generation and Disposal Capacity Report

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Executive Summary

38 M.R.S. § 2122, requires the Department of Environmental Protection ("Department") to update a Statewide Waste Management and Recycling Plan ("Plan") every five years. This update includes an analysis of, and a plan for, the management, reduction, and recycling of solid waste for Maine. While not required, this year's Plan also includes information about existing disposal capacity in order to plan for projected capacity needs. Information in this Plan includes the 2022 data normally included in the Waste Generation and Disposal Capacity Report (38 M.R.S. § 2124-A) which is not due again until January 15, 2026. While this Plan includes the key elements required by statute, many additional elements are included in this Plan to paint a broader picture of how solid waste is managed, handled, and disposed of in Maine. All of these factors combined are complicated and intertwined with geography, transportation and logistics, business and economics, and policy. This report evaluates some of those intertwined factors and also highlights steps that are being taken to better understand these complexities, and what the Department can do to enhance management of waste streams in Maine.

Maine is currently faced with difficult challenges regarding waste management, ranging from the sufficiency of long-term disposal capacity to infrastructure gaps and inconsistent access by Maine communities to programs such as recycling or composting. All of these challenges play an important role in Maine's ability to meet statutory goals of the solid waste management hierarchy including waste reduction and waste diversion. As a path forward to finding solutions to these challenges, multiple comprehensive assessments are currently underway that will provide significant insight into Maine's waste streams, the results of which will lend certainty and credibility to future planning efforts. These studies are described in greater detail within the Plan and include a comprehensive analysis of food loss and waste, the components of municipal solid waste and construction and demolition debris, and sludge capacity and management solutions. It is critical the comprehensive data from these studies allow for appropriate solutions to be identified for Maine's challenges.

The key takeaways from this Plan include the following:

- Maine is currently grappling with a shortage of waste disposal options for the Eastern Maine Region.
- The expansion of Juniper Ridge Landfill ("JRL") in Old Town will be necessary to ensure there is adequate capacity for the entire State of Maine over the next 10 years.
- Assuming an expansion of JRL takes place, Maine has between 15-20 years of capacity left for its statewide waste disposal (with the exception of Aroostook County which has about 40 years capacity remaining).
- To best manage the waste disposal capacity concerns the Department will plan for enhanced waste reduction and diversion programs as well as evaluate key infrastructure needs for waste disposal.
- Increases in waste disposal capacity for Maine will likely need to include expanding landfill space, full operation of incineration and waste processing facilities, and/or implementing new technologies to treat waste streams to either reduce volume or prevent the need for landfilling.

- Current assessments underway will help inform the Department of how to best enhance waste reduction and diversion programs. One of these assessments is complete, while the others are anticipated to be completed in 2024, 2025 and 2026.
- Implementation of the product stewardship program for packaging materials will play an important role likely beginning in 2026 in waste reduction and reuse, while simultaneously supporting recycling efforts at municipalities by 2027.

This Plan is based on the best available data at the time of its release, including input provided by the public, and other publicly available information. Prior to development of this Plan, the Department hosted a series of five regional stakeholder meetings seeking input for updating this Plan. The meetings were held from late June to early August of 2023 in Presque Isle, Machias, Orono, Augusta, and Portland. Meetings were accessible both in-person and remotely, ensuring all interested parties were able to participate. As a result, the Department received valuable feedback that is discussed in this Plan.

I. Introduction

This 5-year update to Maine's Materials Management Plan has been prepared in accordance with 38 M.R.S. § 2122, which states: "The department shall prepare an analysis of, and a plan for, the management, reduction and recycling of solid waste for the State." 38 M.R.S. § 2123-A requires that, "[t]he State Plan [to] include the following elements:

1. Waste characterization. The state plan must be based on a comprehensive analysis of solid waste generated, recycled and disposed of in the State. Data collected must include, but not be limited to, the source, type and amount of waste currently generated; and the costs and types of waste management employed including recycling, composting, landspreading, incineration or landfilling.

2. Waste reduction and recycling assessment. The state plan must include an assessment of the extent to which waste generation could be reduced at the source and the extent to which recycling can be increased.

3. Determination of existing and potential disposal capacity. The state plan must identify existing solid waste disposal and management capacity within the State and the potential for expansion of that capacity.

4. Projected demand for capacity. The state plan must identify the need in the State for current and future solid waste disposal capacity by type of solid waste, including identification of need over the next 5-year, 10-year and 20-year periods."

38 M.R.S. § 2122 also requires that each plan update must be based on the priorities and recycling goals established in 38 M.R.S. §§ 2101 and 2132 and must provide guidance and direction to municipalities in planning and implementing waste management and recycling programs at the state, regional and local levels. The Department published its initial statewide Materials Management Plan in January 2014, and updates it every 5 years to incorporate changes in waste generation trends, changes in waste recycling and disposal technologies, development of new waste generating activities and other factors affecting solid waste management.

The Department views this Plan as an opportunity to comprehensively evaluate and provide information regarding materials management throughout the state. Stakeholder meetings were convened in Presque Isle, Machias, Orono, Augusta, and Portland to assist in this Plan's development and content. Recordings and transcripts for the stakeholder meetings are available on the Department's Materials Management Plan for Solid Waste and Recycling webpage. The Department thanks all stakeholders who attended these meetings virtually or in person for their participation and input to this Plan.

Based on an analysis of current waste management practices in Maine and guided by Maine's Solid Waste Management and Food Recovery Hierarchies (see Appendix A), this 5-year update includes strategies and actions focused on:

1. Increasing waste reduction, food rescue, goods repair (electronics, clothing, furniture, etc.), and reuse initiatives;

2. Continued focus on increasing the diversion of organics from disposal;

3. Diverting materials from landfill disposal;

4. Exploring potential pathways to broaden the economic feasibility and appeal of materials recovery such as green jobs training programs or small business opportunities not yet widely developed in Maine; and

5. Evaluating strategic needs for expansion of waste disposal capacity (landfilling and incineration) and waste processing technologies.

This Plan highlights key challenges with meeting Maine's statutory solid waste disposal reduction and diversion goals and suggests areas of potential exploration and action to determine their suitability for implementation in Maine. Such action will require investments in additional waste management and recycling infrastructure.

II. Waste Generation and Characterization

A. Waste Generation

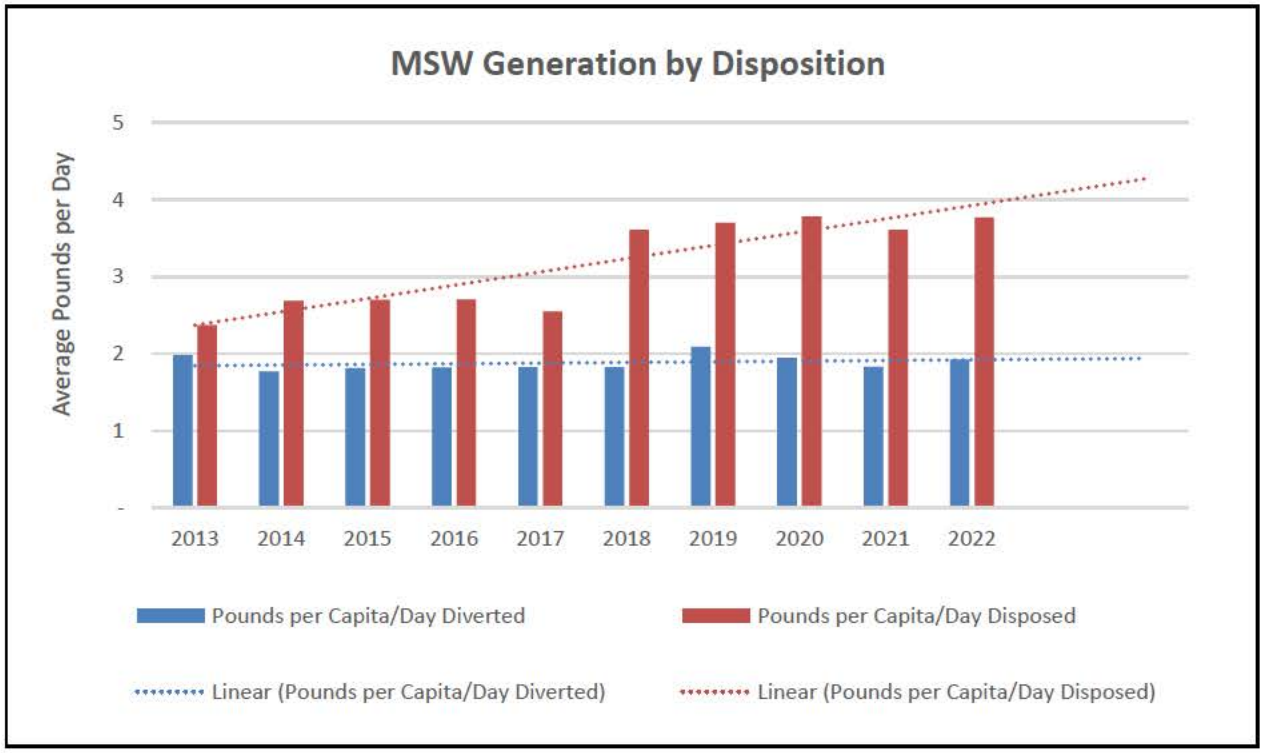
Solid waste, defined by 38 M.R.S. § 1303-C(29) as "useless, unwanted or discarded solid material with insufficient liquid content to be free-flowing," is generated by Maine's households and industrial, commercial, and institutional sectors. 38 M.R.S. § 1305 assigns responsibility for the management of the municipal solid waste ("MSW") to each municipality specifying that "[e]ach municipality shall provide solid waste disposal services for domestic and commercial solid waste generated within the municipality." As there is no specific guidance provided, each municipality chooses how to meet its own responsibility by managing MSW through a combination of municipal and commercial waste handling services, facilities, and systems. Industrial and institutional generators manage the solid waste they generate through their own privately-owned facilities or through contracting with commercial services. While this market-based approach has provided municipalities and other entities with control over how to manage their waste materials, it has become increasingly clear that market failures are contributing to systemic issues such as increased disposal; limited competition among service providers that can increase costs for municipalities; underdeveloped infrastructure, particularly for waste diversion programs; and pricing structures that strongly favor disposal over diversion across much of the state.

Every two years, the Department develops and submits a Waste Generation and Disposal Capacity Report ("WGDC Report") to the Joint Standing Committee on Environment and Natural Resources pursuant to 38 M.R.S. § 2124-A. The WGDC Report provides an overview of Maine's solid waste generation, diversion, and disposal activities during the previous two calendar years, and an evaluation of Maine's progress toward our waste reduction and recycling goals, some of the same reporting requirements for this Plan. It also includes a projection of the solid waste disposal needs of Maine for the next 5, 10, and 20 years, and how the fill rate at each solid waste landfill could affect the expected lifespan of that landfill. Recent years' WGDC reports can be found online at https://www.maine.gov/dep/publications/reports/index.html.

For the past several years, the WGDC report has been a biennial report. However, 38 M.R.S. § 2124-A was amended in 2023[1] to modify the frequency for the WGDC Report to an annual basis. Since reporting requirements for both reports are similar, the Department has combined the 2024 WGDC Report for the 2022 reporting year with this Plan.

Review of the WGDC Reports from the past several years shows that the amount of MSW disposed in Maine has been trending up, while diversion (including all tracked food rescue, animal feed, repair and reuse, recycling, composting, anaerobic digestion, etc., for which data is available[2]) has remained roughly constant although this data is limited. The per capita disposal and diversion rates are depicted in Figure 1 below.

Figure 1. Municipal Solid Waste Generation Per Capita

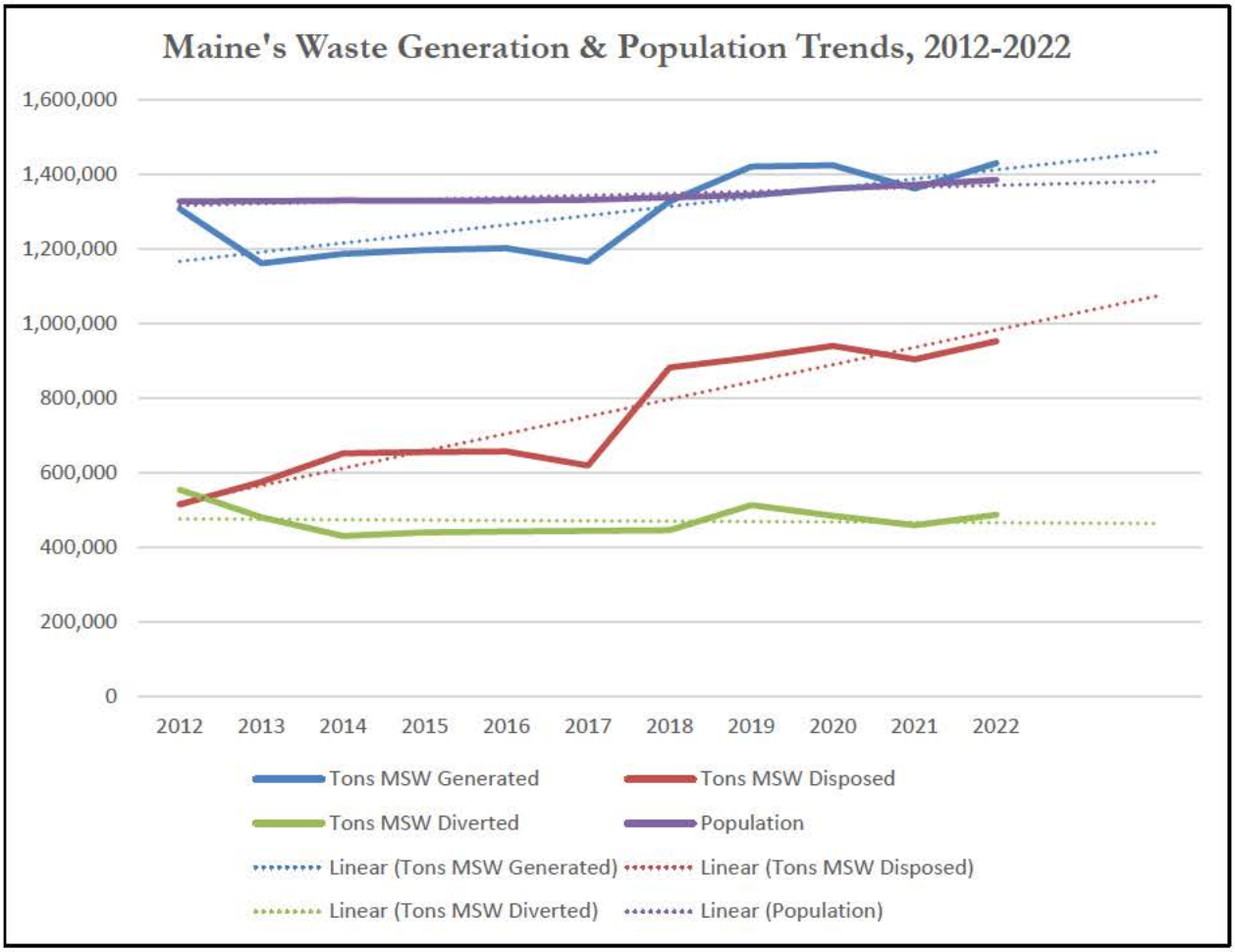


Maine's population is growing but the per capita data suggests that the increase in disposal tonnage is not simply a factor of increased population. As shown in Figure 2 below, Maine's disposal tonnage is trending upward faster than the population is growing, while tracked diversion activities remains flat. Subsequently, additional waste disposal capacity will be needed in the long-term, unless there is additional infrastructure in place as well as robust implementation of statewide diversion programs to recover recyclables and organics, and other materials that could

[1] 38 M.R.S. § 2124-A was amended in 2023 by L.D. 1172 – *An Act to Reestablish Annual Reporting on Solid Waste in Maine.* This law requires submittal of the WGDC Report on or before January 1, 2026 and annually thereafter.
[2] Data for food rescue, animal feed, and repair and reuse is extremely limited; this likely represents only a small subsection of the total quantity of material diverted through such activities.

be diverted from waste disposal. Systemic changes and infrastructure investments will be necessary to reverse this trend.

Figure 2. Waste Management and Population Trends 2012-2022[3]



B. Waste Characterization

1. Studying Waste in Maine

As described in more detail below, the Department is in the process of moving forward with several different studies to better characterize and understand waste streams in Maine. These studies will be utilized by the Department to assist in long-term waste management planning by providing a comprehensive understanding of the composition of waste currently being disposed. This will allow the Department to target majority components of the waste stream

[3] MSW disposed includes MSW incinerated, landfilled, and exported for disposal. It does not include MSW incinerator ash, which is a special waste that was included with MSW totals until 2018, when the Department decided to include that material with special waste totals. While incinerator ash is a residue of incinerating MSW, it is classified as a special waste ("SPW") in Maine.

for future reduction, diversion, recycling, composting, and anaerobic digestion, and reduce the overall amount of material requiring disposal. It will also aid in planning for the best management of the available space in our landfills and the capacity of Maine's other waste management facilities. Below is a discussion of each of the studies that will be providing critical information that will be necessary in the next phase of solid waste management planning for Maine.

a. General/All Waste Stream Study

The composition of waste generated in Maine and disposed in Maine's facilities can be quite varied. As an example, Table 1 presents the waste types disposed at the Juniper Ridge Landfill ("JRL") in Old Town. The sort categories for a waste characterization study being conducted (discussed later in this Report) on behalf of the Department in 2024 can be found in Appendix B.

Although the Department has not conducted a formal waste characterization study, the Department has evaluated the data provided by various waste management facilities in annual reports submitted to the Department. To supplement this evaluation, the Department is also in the process of contracting a comprehensive statewide audit called a Waste Characterization Study ("WC Study") to begin in 2024. The data gathered from this statewide WC Study will provide a baseline of data for Maine's waste streams and by sector to include the types, amounts and sources of materials generated and destined for disposal. In addition, the WC Study will provide the state with an improved understanding of the sources, content, and condition of construction and demolition debris ("CDD"). It is anticipated that this WC Study will be completed by the beginning of 2025. Funding for the WC Study was provided by the United States Environmental Protection Agency ("USEPA") Solid Waste Infrastructure for Recycling ("SWIFR") grant. This SWIFR grant program includes funding specifically to states for waste characterization studies. Once the WC Study is completed, it will be appended to this Plan and will include additional recommendations based on the study's findings.

Table 1. Summary of Wastes Accepted at Juniper Ridge Landfill in 2022

MSW & CDD Wastes	Total (tons)
Bypass MSW	276,619
CDD/MSW Processing Residue - OBW (Disposed of in the Original 2004 Permitted Footprint)	4,222
CDD/MSW Processing Residue - OBW (Disposed of in the Expansion Permitted Footprint)	74,950
CDD Processing Residue - Fines	73,689
Mixed CDD	332,290
Wood from CDD	147
Residue/Trash from Single Stream	7,064
Total MSW & CDD	**768,981**[4]
Special Wastes (SPW)	**Total (tons)**
Burn Pile Ash and/or Hot Loads Area Ash	239
Burnt Structure Debris/Ash	1,828
Catch Basin Grit & Street Sweeping	680
Coal, Oil & Multi-fuel Boiler Ash	4,259
Contaminated Soil & Debris	20,977
Industrial (Miscellaneous)	525
Industrial WWTP Sludge	15,888
Leather Scraps	70
Lime Mud/Grit	4,784
MSW Incinerator Ash	29,502
Municipal WWTP/POTW Sludge	78,383
Non-Friable Asbestos	561
Non-Hazardous Chemical Related	1,033
Oil Spill Debris	1,037
Polyethylene & Cellulose Trimmings	1,917
Pulp Mill Waste	751
Sandblast Grit	533
Spoiled Foods	458
Sulfur Scrubbing Residues	545
Water/Air Filtration Media	10
WWTP Grit Screenings	692
Total SPW	**164,672**

[4] Totals for Waste Types (MSW, CDD, and SPW) in Table 1 are based on adding the individual tonnages by material type and vary slightly from the table provided within Juniper Ridge Landfill's annual report most likely due to rounding.

b. Food Waste Stream Study

In addition to the WC Study, the Department is also conducting a Food Loss and Waste Generation Study ("FLWG Study") funded by a Climate Pollution Reduction Grant from USEPA[5], which will provide extensive insight into the locations, types, and quantity of food loss and waste, as well as the quality of that food, across the state. Information gathered from studies in other states and municipalities have shown that food scraps, food-related wastes, and other organic materials may comprise roughly 40% of Maine's solid waste stream and are for the most part suitable for diverting into higher and better uses in a range of activities from feeding hungry people or animals to being transformed into valuable soil amendments that may improve the health and vitality of agricultural land and soils.

To strategically plan for addressing food loss and waste, it is imperative that the Department gather reliable data on how much food is generated and wasted and how that waste is currently managed, as well as characterizing the quality of the surplus food to identify higher and better uses. The FLWG Study will provide comprehensive data on the quantity, quality, types, and sources of surplus food and food scraps currently generated by geographic location. Additionally, data collected will be broken down by generating sector and geographic location, providing a robust source of information about surplus food generation by entities such as grocers, farmers, restaurants, food pantries, schools and universities, prisons, hospitals, and other businesses generating food-related wastes. The data collected from this study will allow the Department to prepare an informed analysis, and a plan for moving food up the food recovery hierarchy within the entire State in an effort to mitigate hunger as well as reduce greenhouse gas emissions and conserve the energy, water and financial capital embedded in wasted food, with an added benefit of improving soil health by recovering nutrients and returning them to agricultural land and soils.

This assessment is the first phase in the state's movement towards developing a comprehensive plan for addressing food loss and waste in Maine. Initially, the results of this assessment will be used as the basis for an assessment of the greenhouse gas emissions impact from food loss and waste. This assessment will also be used as the baseline for an initial assessment of the current waste management infrastructure's ability to meet Maine's greenhouse gas emissions reduction goals and waste reduction and diversion goals and provide recommendations for infrastructure improvements.

c. Sludge/Biosolids Waste Stream Study

A significant issue that has come to the forefront in recent years which will likely influence multiple aspects of materials management from recycling to landfilling to organics management in the future is the presence of per- and polyfluoroalkyl substances ("PFAS"). Used in household products, industrial settings, and firefighting foam since

[5] In collaboration with the Governor's Office of Policy Innovation and the Future ("GOPIF"), which is passing grant funding through to the Department to conduct the FLWG Study.

the early 1950s, these chemicals are persistent and bioaccumulative in the environment.[6] The Maine Legislature has enacted a number of laws relating to PFAS including a ban on the land application, distribution or sale of sludge and sludge-derived products, effective August 2022[7], a ban on carpets, rugs, and fabric treatments with intentionally added PFAS, effective January 2023, as well as a ban on products with intentionally added PFAS effective January 2030.[8] Rulemaking is currently underway to prohibit PFAS in certain food service packaging.[9]

With the passage of the ban on the land application of sludge and sludge-derived products, this material is being almost exclusively driven toward Maine's landfills because there is a dearth of other options for economically viable disposal in both the state and region.[10] The physical nature of this material complicates landfill operations requiring the use of bulking material, sometimes at a high ratio, to provide landfill stability. The use and type of sludge bulking material is generally landfill-specific and can consist of various types of wastes like CDD (including bulky wastes), ash, and soil, although bulky wastes are preferred. Adding more wastes in the form of both sludge and bulking materials increases the overall rate at which Maine landfills will reach maximum capacity.

In response to the marked increase in municipal Wastewater Treatment Plant ("WWTP") sludge and associated bulking materials disposed in Maine starting in 2022, as well as challenges to landfill operations that occurred in early 2023, the Department, in collaboration with the Maine Water Environment Association ("MWEA"), commissioned a study to evaluate sludge management practices in Maine and make recommendations for the future. It is intended that this study will provide important information that may be useful for policy decisions moving forward. This study, An Evaluation of Biosolids Management in Maine and Recommendations for the Future, was completed on December 15, 2023. The study assesses current sludge generation rates, limiting factors at landfills (for example, limits on wet wastes and the need for bulking agents), uncertainty of future landfill capacity in Maine, and different types of sludge management strategies. The strategies recommended include volume reduction by dewatering, anaerobic digestion, thermal drying, as well as PFAS destruction technologies for piloting in Maine. The study also provides information relating to both costs and feasibility of each of the recommendations.

[6] See EPA's guide to PFAS for more information: https://www.epa.gov/pfas/pfas-explained.
[7] See 38 M.R.S. § 1306(7).
[8] See 38 M.R.S. § 1614.
[9] See 32 M.R.S. § 1733(3-B).
[10] In March 2023, the Department investigated alternative outlets other than in-state landfill disposal for sludge generated from municipal WWTPs. It became clear that Maine had no other alternatives available within the state for disposal of this waste stream. Operators of Sewage Sludge Incinerators ("SSIs") and landfills in the entire northeast region had no additional capacity to take Maine's sludge. As a result, options remaining were to ship the waste stream to a company in New Brunswick, Canada to use to make sludge derived compost or to ship the waste to landfills as far away as Ohio or South Carolina. Sending to Canada proved to be the most economically viable outcome despite a steep rise in costs to WWTPs. More background information is available in this report An Evaluation of Biosolids Management in Maine and Recommendations for the Future.

As volume reduction and PFAS destruction strategies are developed and implemented for managing sludge, the need to rely solely on landfills for disposal will shift. Across the country, researchers are working on technologies that will allow for treatment and destruction of PFAS in several types of media including sludges.[11] Should any of these technologies become feasible to scale up and deploy in a cost-effective manner, the door might be reopened for a cautious return to agronomic utilization, with proper sampling and monitoring to ensure that the treated materials are safe for such use. Because these technologies are still in pilot phase, the return to agronomic utilization is likely several years in the future and will not provide a short-term solution for Maine's landfill capacity challenges. Until these technologies become economically viable and scaled to work in Maine, landfill capacity will need to be managed to include disposal of sludges and necessary bulking materials.

d. Packaging Material Waste Stream / Recycling Needs Assessment Study

38 M.R.S. § 2146 enacted in 2021, requires the Department to establish a new product stewardship program for packaging materials. The overall intent of the program is to reduce the amount of packaging from consumer products that go into the landfill and to provide a mechanism to compensate municipalities for handling these packaging materials. The legislature determined that a significant volume of waste going into landfills is in part due to the amount of packaging materials that are used in consumer products (and that are used in shipping of products by third party sellers). The intent of this new law was to create a new program using a producer responsibility model to incentivize producers to reduce the generation and use of unnecessary packaging materials, and thus lower the overall volume of these materials needing a place for waste disposal. Rules for this new program are currently being developed. As part of this program a statewide needs assessment for recycling will be conducted. This assessment will not be completed until the new program is in place and will likely be completed sometime after 2026. This study, which will be funded by producers of packaging, will provide valuable information regarding gaps in Maine's recycling programs with respect to packaging.

[11] See PFAS Disposal and Destruction Research | US EPA and DEP's website on Treatment and Disposal for PFAS - PFOA and PFOS, Maine Department of Environmental Protection.

2. Current Understanding of Maine's Waste Streams

This section of the report will focus on Maine's current understanding of its waste streams. As explained in Section 1, the Department is looking forward to amassing new information about its waste streams so that it can better plan into the future. Until information is obtained from the completed studies, the Department is relying on other sources of existing information including Annual Reports from waste disposal and waste processing facilities, Recycling Establishment Reports, and Municipal Recycling Progress Reports submitted to the Department.

a. Construction and Demolition Debris ("CDD")

Using the existing information listed above, the Department prepares a biennial WGDC Report outlining the waste generated and ultimately disposed of in Maine. Providing a delineation of waste by type and sector is beyond the statutory scope of the WGDC Report, however, the report provides a basic analysis of the following waste streams: MSW, CDD and similar material, SPW, and wood wastes. As shown in Figure 3 below, MSW comprises the majority of waste generated in Maine, followed by CDD, with other materials making up a smaller proportion of the overall waste managed. Also illustrated in the figure is the amount of material that landfill owners received for cover material and other uses by the landfill, which may include a wide variety of permitted materials, including CDD, processing residues from CDD, and other special wastes. As CDD is the second largest category of waste, this Plan will focus on its generation and disposal in more detail. Future addendums to this Plan will incorporate the results and recommendations of the WC Study and the FLWG Study once completed. Figure 3 below includes total Maine-generated wastes disposed within Maine landfills and incinerators, and wastes generated within Maine and exported to out-of-state landfills for disposal. Waste tonnage used as cover material is included as this material also takes up valuable space within landfills.

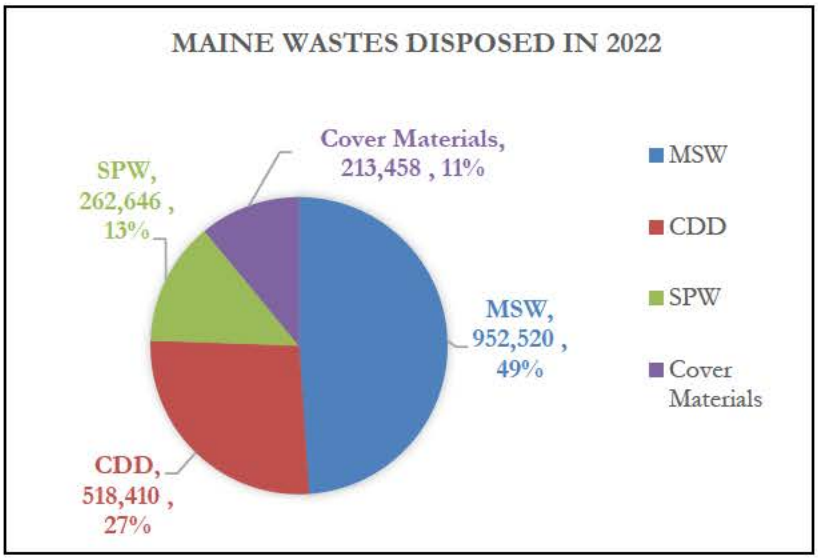
For comparison, while CDD makes up nearly 30% of Maine's waste stream, not including the significant amounts of cover material comprised of CDD, Vermont's 2018 waste characterization study showed that CDD makes up just 16% of its waste.[12] Like Maine, New Hampshire and Vermont are both in the process of conducting waste characterization studies that will be available in the beginning of 2025. Study results from Vermont and New Hampshire will provide a valuable and interesting comparison to the composition of Maine's waste stream.

Several facilities in Maine receive CDD or other wastes and process them to recover materials such as metal, wood chips, or plastics. After processing, much of the residue or waste that cannot be recovered is then sent to disposal facilities. Some of these

[12] See: https://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/2018-VT-Waste-Characterization.pdf.

processing residues can be used for landfill cover and shaping, while some materials are not suitable for an alternate use within the landfill and must be managed as waste.

Figure 3. Maine Generated Wastes Disposed in 2022



Once processed by a Maine facility, any outgoing material from the facility is considered to be a waste generated within the state.[13] Processing facilities are required to be licensed by the Department. As permitted, these facilities may receive material from both within and outside of Maine as well as send disposal material to facilities within or outside of Maine.

As an example, Table 2 depicts the origin of material received by ReSource Waste Services of Lewiston LLC ("ReSource Lewiston") and WIN Waste Innovations in Eliot (formerly Aggregate Recycling Corporation), the two largest processing facilities in Maine by volume for 2022. The total amount of material sent to Maine landfills from these facilities in 2022 was 130,580 tons. Tables 3 and 4 specify the destinations of the materials leaving these facilities after processing. There are other smaller processing facilities that operate in a similar manner but are not highlighted here.

[13] Waste generated within the state is defined at 38 M.R.S. § 1303-C(40-A)(C).

Table 2. Origin of Materials Received at Large Maine CDD Processing Facilities in 2022

Facility	ME	MA	NH	CT	RI	Unknown[14]	Total
ReSource Lewiston (Tons)	36,563	87,991	40,123	-	-	-	164,677
% of Total	22%	53%	24%	-	-	-	-
WIN Waste Innovations (Tons)	11,586	6,279	18,552	2	501	20,083	57,003
% of Total	20%	11%	33%	0.004%	1%	35%	-
Total Tons by State	**48,149**	**94,270**	**58,675**	**2**	**501**	**20,083**	**221,680**
Overall % of Total	**22%**	**43%**	**26%**	**0%**	**0%**	**9%**	-

Table 3. ReSource Lewiston Material Disposition

	Recycling (Non-Landfill Use)	Landfill Use (shaping, grading, cover, etc.)	Maine Landfill Disposal	Total to Maine Landfill	Total Tons
Percent of Total Tons by Disposition	9%	44%	47%	91%	-
Amount from Maine[15] (Tons)	3,470	16,331	17,519	33,850	37,320
Proportional Amount from OOS[16] (Tons)	12,158	57,222	61,385	118,607	130,765
Total Tons	**15,628**	**73,553**	**78,904**	**152,457**	**168,085**

[14] These materials were received prior to when the facility began tracking the origin of received material.

[15] The proportional amount for Maine is based on the percent of waste materials received at the facility originally generated in Maine. For example, approximately 22% of the materials received at ReSource Lewiston was from Maine in 2022.

[16] The proportional amount for OOS ("Out-of-State") is based on the percent of waste materials received at the facility originally generated in another state. For example, approximately 78% of the materials received at ReSource Lewiston was from Massachusetts and New Hampshire in 2022.

Table 4. WIN Waste Innovations Material Disposition

	Recycling (Non-Landfill Uses)	Ash Landfill (Ground Cover) - Exported to MA	Maine Landfill Disposal	Total Tons
Percent of Total Tons by Disposition	3%	15%	81%	-
Proportional Amount from Maine[17] (Tons)	429	1,925	10,335	12,689
Proportional Amount from OOS[18] (Tons)	1,716	7,701	41,341	50,758
Total Tons	**2,145**	**9,626**	**51,676**	**63,447**

Materials diverted from a landfill by ReSource Lewiston's processing included 11,572 tons of various materials including CDD wood chips sent for particle board production, plastics, sheetrock, tires, and aggregate sent for fill or further processing. According to the Annual Report submitted to the Department by Resource Lewiston, 73,553 tons were sent to the JRL for shaping, grading, cover, or use in landfill venting systems in 2022. WIN Waste Innovations similarly accepted a larger quantity of materials from other states than from within Maine and sent a larger quantity of waste to Maine landfills than it received from within Maine, as shown in Tables 2 and 4. For example, WIN Waste Innovations received approximately 11,586 tons of waste from Maine in 2022, during which time the facility received approximately 25,334 tons from other New England states, and, prior to tracking the state from which material was received, took in about 19,235 tons of mixed construction and demolition debris and 848 tons of ground asphalt shingles for which the origins are unknown. WIN Waste Innovations took in approximately 57,003 tons of material in total and sent just over 50,000 tons of debris to Maine landfills, with the majority (46,457 tons) going to JRL. In some cases, the amount of outgoing waste or recyclable material reported for a calendar year may be greater than the amount accepted by a facility during that year due to materials that had been stored on-site from the previous year's activity.

b. Problematic Material[19]

Some wastes that are not present in the waste stream in large quantities are still challenging for waste handling, processing, and disposal facilities. These wastes are

[17] The proportional amount for Maine is based on the percent of waste materials received at the facility originally generated in Maine; for example, approximately 20% of the materials received at WIN Waste Innovations was from Maine in 2022.

[18] The proportional amount for OOS is based on the percent of waste materials received at the facility originally generated in another state; for example, approximately 80% of the materials received at WIN Waste Innovations was from Massachusetts and New Hampshire in 2022.

[19] Problematic materials are unwanted materials that are difficult to manage in household and commercial waste such as mercury-containing auto switches, thermostats, and bulbs; rechargeable batteries; and paint. These materials can be challenging to manage due, in part, to their chemical composition, fire potential, or detriment to the environment if spilled.

described in more detail in this section. Some of these waste types are managed through product stewardship programs in Maine, as described in the Department's Annual Product Stewardship Report. Other waste types in this category require more robust handling, processing and disposal measures. Once the WC Study has been completed, the Department may evaluate further whether any special measures should be taken for wastes that fall into this category.

i. Producer Responsibility Programs

Maine currently has product stewardship programs, which aid in diverting the following materials from disposal:

- Mercury auto switches (38 M.R.S. § 1665-A);
- Specific electronic devices (38 M.R.S. § 1610);
- Cell phones (38 M.R.S. § 2143);
- Mercury thermostats (38 M.R.S. § 1665-B);
- Mercury-added lamps (38 M.R.S. § 1672);
- Paint (38 M.R.S. § 2144);
- Rechargeable batteries (38 M.R.S. § 2165); and
- Pharmaceuticals (38 M.R.S. § 1612).

Maine is currently in the process of establishing an Extended Producer Responsibility Program for Packaging ("EPR Packaging Program") to meet the requirements set forth in 38 M.R.S. § 2146. It is anticipated that this program will begin operation in 2026 with municipalities receiving reimbursements for some of the costs related to handling packaging materials in 2027.

ii. Beverage Redemption Container Program

Maine has a returnable beverage container program pursuant to 38 M.R.S. §§ 3101 - 3119, which is a type of product stewardship program as it places some responsibility on entities other than consumers and municipalities to recover materials. All material collected as part of the returnable beverage container program is required to be recycled.

iii. Household Hazardous Waste ("HHW") and Waste Pesticides

In recent years, Department staff have noticed an increase in inquiries about Household Hazardous Waste ("HHW") and Waste Pesticides. HHW is a term used to describe any hazardous waste material excluded from identification as a hazardous waste by 06-096 C.M.R. ch. 850, § 3(A)(4)(vii) because it is generated by households, including single and multi-family residences, hotels and motels, bunkhouses, picnic grounds, and day-use recreational facilities. These materials are exempt from the precautionary handling requirements that apply to commercially generated hazardous waste. Many waste pesticides are banned from landfilling while some are not, meaning that some may be disposed of in a landfill.

Options to manage pesticides and other types of HHW are extremely limited in many regions of Maine. This results in more items being disposed of in Maine's landfills that could be diverted.

For waste pesticides, the Maine Board of Pesticides Control conducts a program each October to collect and properly dispose of banned and unusable pesticides from homeowners and farms. Pre-registration is required, registration numbers are limited, and collections are held at just four sites across the state one day per year, so the program, while important, is limited in scope and capacity.

For HHW, there are only two permanent collection sites open to all Maine residents; however, they are only open on a seasonal basis (not in winter) and are both located in the Southern part of the State (Lewiston and Portland). Disposal at these facilities is expensive and often inconvenient for many Maine residents.[20] While some municipalities provide one-day collection events for HHW, these are not consistent or routine, and due to the costs, many municipalities have ceased holding HHW collection events altogether.

iv. Consumer Electronic Products and Batteries

With the proliferation of consumer electronics, more electronic devices and batteries are making their way into the municipal waste stream, from laptop computers and tablets to vape pens. Many of these products are recycled through Maine's product stewardship program for electronic wastes. Non-covered products are likely to end up in the landfill or to be managed at a waste processing facility. The Department anticipates further information about these types of wastes in the upcoming WC Study and will also be addressing these wastes in the 2024 Product Stewardship Report.

III. Waste Reduction, Diversion, and Recycling Assessment

A. Laws Addressing Recycling and Diversion Goals

Maine has several relevant laws addressing recycling and waste diversion. 38 M.R.S § 2101 establishes a Solid Waste Management Hierarchy to be used as guiding principles in decision-making for the management of solid waste. 38 M.R.S. § 2101 sets forth an integrated approach to solid waste management with waste reduction as the highest priority, followed by reuse, recycling, composting, waste processing to reduce waste volume including waste-to-energy, and landfilling as the management option of last resort. 38 M.R.S. § 2101-B, the Food Recovery Hierarchy, provides additional guidance on the management of food waste within the context of the Solid Waste Management Hierarchy. It prioritizes reducing surplus food generation at the source, donating surplus food to feed hungry people, diverting food scraps for use as animal

[20] Fee structures vary from $3.50 per pound or $6.50 per gallon to $33-$40 per unit, depending on the facility and whether the person dropping materials off is part of a municipality that has arranged for reduced fees.

feed, composting of food scraps and diversion to waste utilization technologies to create fuels and recover energy, and finally, incineration or land disposal.

Additionally, Maine's laws have established specific recycling and waste reduction goals including:

- 38 M.R.S. § 2132(1) A goal to recycle or compost50% of the MSW tonnage generated each year within the State by January 1, 2021.

- 38 M.R.S. § 2132(1-B) A goal to reduce the statewide per capita disposal rate of MSW tonnage to 0.55 tons disposed per capita by January 1, 2019 and to further reduce the statewide per capita disposal rate by an additional 5% every 5 years thereafter. This incremental goal of reducing waste by 5% every 5 years provides a mechanism to measure progress at the municipal level.

- 38 M.R.S. § 2133(1-A) Municipal responsibilities for meeting the goals above. Municipalities are not required to meet the state recycling goal in 38 M.R.S. § 2132, but they must *demonstrate* reasonable progress toward that goal, and the Department shall *determine* reasonable progress. While reasonable progress is not specifically defined in statute, the Department notes that the goals set in statute are used as criteria for determining progress.

It is important to clarify that composting, anaerobic digestion, and any waste reduction, reuse, or recovery of materials to prevent them from becoming waste is considered a municipal diversion effort. For example, communities hosting repair cafés or annual yard sales may use the estimated diversion amounts from such events to support their traditional recycling program or other established municipal programs to divert materials from disposal. This information may be reported by a municipality in their Municipal Recycling Report.

38 M.R.S. § 2133(7) outlines reporting requirements for municipalities to provide data to the State for evaluating progress toward the goals outlined above. Municipalities are required to report biennially on forms provided by the Department, on their solid waste management and recycling practices. The biennial report must identify the options available to residents and businesses within the municipality for managing solid waste, including any provisions for the separate management of reportable recyclable materials and organic waste and the disposal of other MSW, including CDD.

B. Reducing the Amount of Waste Generated

The Department's 2019 Plan identified that market conditions for solid waste management in Maine created significant drivers that worked against managing wastes higher up Maine's Solid Waste Management Hierarchy. Today this is still true. Simply put, it is expensive to start up a program where specific waste materials are separated out from other waste streams for recovery, even if such a program has the potential to save money and conserve disposal capacity in the long run. Additionally, given the constraints for the Department as discussed later, landfilling material is still currently the less expensive option. Table 5 below outlines Maine's progress toward waste reduction goals.

Table 5. Assessment of Progress Towards Per Capita Waste Reduction Goal

Maine MSW Disposal vs. Goal	2022
Tons MSW Generated and Disposed	952,520
Pounds MSW Generated and Disposed	1,905,039,782
Population	1,385,340
Tons per Capita	0.69
Pounds per capita	1,375
Tons per Capita Disposal Reduction Goal	0.55
Tons per Capita Short of Goal	(0.138)
Pounds per Capita Short of Goal	(275)
Per Capita Pounds Disposed per Week	26
Per Capita Pounds Disposed per Day	3.8

It is important to distinguish between waste generation and waste disposal. Waste generation includes the generation of all waste materials, even materials that are diverted from disposal and managed through an alternate pathway such as recycling or composting. These materials are still a waste that has been generated and requires management, but there is significant potential to improve processes and provide economic incentives to recover the resources in waste. Managing waste sustainably reduces the extraction of virgin natural resources, and often the energy use and other impacts related to extraction, processing, and transport of natural resources to produce new products.[21]

When we dispose of an item, we may not consider the waste that was generated in that item's production, or the resources that were consumed to produce the item. A way to better grasp the complete impacts of our waste is to consider the full lifecycle of goods, from resource extraction, processing and energy and water use to emissions. For example, disposing of food is a waste of the resources that go into producing food, including agricultural land, water, pesticides, fertilizers, and energy. The production, transport, storage, and other management of food generates significant greenhouse gas emissions that are wasted when the food goes uneaten. Surplus food or food scraps that end up in landfills generate methane, a potent greenhouse gas.

Capturing surplus food and food scraps prior to entry into the disposal pathway provides an opportunity to reduce reliance on disposal options while providing Maine's communities with an opportunity to prevent hunger or reuse these valuable nutrients to enrich soil while reducing greenhouse gas emissions.

EPA's Waste Reduction Model ("WARM")[22] is a tool designed to compare waste management scenarios, such as landfill or incineration of materials versus recycling, composting, or anaerobic digestion, to determine the potential greenhouse gas emissions reductions, energy savings, and economic impacts from different waste management practices. The WARM tool can also be

[21] https://www.epa.gov/warm/basic-information-about-waste-reduction-model-warm.
[22] The WARM tool may be accessed online at https://www.epa.gov/warm.

used to compare diversion activities higher up the waste and food recovery hierarchies, including food rescue, reuse, and waste reduction. Using Maine-specific data and a high-level summary of 2022's diversion activities, Table 6 provides an estimate of the greenhouse gas emissions reductions related to Maine's statewide food rescue, recycling, composting, and anaerobic digestion activities.

The WARM tool provides the estimated greenhouse gas emissions reductions in Metric Tons of Carbon Dioxide Equivalents ("MTCO2E"), along with a simple equivalent measure to understand the environmental impact by translating the metric tons of carbon dioxide into the equivalent avoided emissions of passenger vehicles[23] driven for a year.[24]

Table 6. Estimated Greenhouse Gas Reductions Based on 2022 Diversion Activities

Diversion Pathway (Compared to Landfill Disposal)	Greenhouse Gas Emissions (MTCO2E) Reduction[25]	Equivalent Annual Passenger Vehicle Emissions	Tons of Material Diverted from Disposal	Greenhouse Gas Emissions (MTCO2E) Reduction Per Ton Diverted
Food Rescue[26]	16,082.26	3,414.49	3,829.75	4.20
Traditional Recyclables	526,858.83	111,859.62	188,061.20	2.80
Scrap Metal Recycling	1,110,367.07	235,746.72	251,975.14	4.41
Compost (Food/Yard Waste)	2,742.26	582.22	7,663.77	0.36
Anaerobic Digestion	11,561.46	2,454.66	21,520.57	0.54
Total/Average (per Ton)	**1,667,611.87**	**354,057.72**	**473,050.43**	**3.53**

Traditional recyclables included in the scenario above include typical household packaging and paper, such as cardboard, paper, glass, beverage containers, plastic jugs, tubs, and film, and metal cans. The "food waste" and "yard trimmings" categories were used to calculate emissions reductions related to composting. The "food waste" category was also used to model food rescue, with a 1-3% (used 2% as the average) loss rate factored in, as per the EPA WARM tool guidance. The food rescue tonnage data sources are limited, and this tonnage data comes from just a few large chain retailers for which information was readily accessible by the Department. It is likely the actual food rescue quantities are significantly greater. The food wastes diverted via

[23] Passenger vehicles are defined as 2-axle 4-tire vehicles, including passenger cars, vans, pickup trucks, and sport/utility vehicles. The WARM tool is based on average U.S. vehicle mileage of 11,520 miles per year and a weighted average fuel economy of 22.9 across all vehicle types. See EPA's reference page for details: https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references#vehicles.

[24] The WARM tool is not intended to be used as a Greenhouse Gas Emissions annual inventory tool as it reflects the full lifecycle of a waste. See the EPA Life-Cycle GHG Accounting Versus GHG Emissions Inventories fact sheet for details: https://www.epa.gov/sites/default/files/2016-03/documents/life-cycle-ghg-accounting-versus-ghg-emission-inventories10-28-10.pdf.

[25] Modeling in WARM is comparing diversion to landfill disposal.

[26] This includes food donation as well as animal feed donated to farms; uses that still resulted in the food being consumed rather than managed as waste.

anaerobic digestion include milk and brewery wastes, food waste, and other source-separated organics; the food waste category was also used to model their diversion in the WARM tool.

1. Recycling Assessment

Table 7 presents Maine's current recycling rate, including a breakdown of CDD and MSW disposition during 2022.

Table 7. MSW and CDD Disposition During 2022

Maine MSW Disposition	**Tons**
Maine MSW landfilled in state	515,474
Maine MSW disposed via waste-to-energy	382,609
Maine MSW disposed of out-of-state	54,437
Subtotal Maine MSW (exclusive of CDD) Disposed	**952,520**
Paper; cardboard; plastic, metal, and glass containers, textiles; and white goods recycled	188,061
Other MSW recycled (ferrous and non-ferrous scrap metal, and vehicle batteries)	255,142
Estimates for MSW reused (textiles, packaging, etc.)	9,523
Reported food rescue (food donation for human consumption)	3,565
Reported food rescue (animal feed)	1,223
Reported MSW composted (includes yard waste and food scraps, food processing waste; does not include backyard composting and <60 yds^3/month)	7,664
Anaerobic digestion (not including non-food commercial wastes such as de-icer, distillate or fats, oils, and grease)	21,521
Subtotal Maine MSW Reused, Rescued, Recycled & Composted/Digested	**486,698**
Total Maine MSW (exclusive of CDD)	**1,439,218**
Maine's MSW Recycling Rate (exclusive of CDD)	**33.8%**
Maine CDD Disposition	**Tons**
Mixed CDD disposed of in-state	505,282
Mixed CDD disposed of out-of-state	13,128
Processed CDD sent to a landfill for daily cover, shaping, and grading	76,664
Processed CDD recycled into new wood products	7,589
Processed CDD beneficially used as fuel	6,842
Subtotal Maine CDD recycled & beneficially used as fuel	14,431
Total CDD generated	609,506
Maine's CDD Recycling Rate (all non-landfill uses)	**2.37%**
Total MSW & CDD generated	2,048,723
Total MSW & CDD disposed (includes materials used in landfill for cover, shaping, and grading)	1,547,594
Total MSW, CDD, and organics recycled and composted (including wood waste used as fuel chips)	501,129
Maine's Combined MSW, CDD & Organics Recycling Rate	**24.46%**

The global economic impacts from changes in recycling policies discussed in our 2019 Plan[27] continue to have a lingering effect on recycling in the United States and across the world. Generally, recycling outlets continue to require higher quality bale specifications than in years past, which results in materials recovery facilities needing to invest more time and labor in sorting single-stream recycling to create bales of materials acceptable to available markets.[28]

The changed economics of recycling have caused many municipalities in Maine to consider curtailing or eliminating their programs. Some communities have faced steep increases in costs for recycling services from private sector companies. When these costs are greater than the cost of disposal some are opting to suspend recycling services, at least until recycling is less costly than disposal. As shown in Table 8 below, there is much greater variability and higher costs associated with recycling than with disposal fees for MSW or CDD.

Decreased market values have caused some towns that operate facilities which collect source-separated materials to stop collecting mixed plastics, redirecting this recycling stream to disposal. For example, in 2022 only 176 municipalities out of nearly 500 submitted recycling progress reports. Approximately 130 indicated that they offer some form of recycling program, but these vary greatly in terms of what materials can be recycled from a cardboard-only drop-off program to curbside recycling for commingled materials.

Table 8. Municipal Costs Reported for Recycling and Disposal

Cost Comparison Per Ton - Recycling vs. Disposal[29]				
	Recycling (Hauling)	Recycling (Processing)	Disposal (MSW)	Disposal (CDD)
Min	$55.00	$ -	$0.50	$17.00
Max	$900.00	$384.00	$225.00	$225.00
Median	$391.43	$85.00	$82.70	$95.86
Average	$440.80	$99.25	$86.90	$96.64

2. Current Diversion Programs

Maine has two programs that are specifically designed to assist with waste diversion; the Solid Waste Diversion Grant Program ("Waste Diversion Grant Program"), and the recently enacted EPR Packaging Program.

The Waste Diversion Grant Program provides grants to public and private entities to assist in the development, implementation or improvement of programs, projects, initiatives or activities designed to increase the diversion of solid waste from disposal in the State. The

[27] See the 2019 Plan update for additional information: https://www.maine.gov/dep/publications/reports/index.html.
[28] See: https://resource-recycling.com/plastics/2022/04/06/study-national-sword-increased-us-landfilled-plastic/.
[29] The majority of municipalities specified the tip fee per ton. For municipalities that did not specify, it is assumed that the amount they provided is the tip fee rather than the total cost.

Department offers these grants twice annually. The Department seeks proposals that will take advantage of regional economies of scale to increase organics management and recycling infrastructure in underserved areas of the state; promote waste reduction through reuse, repair and sharing economy initiatives (i.e., tool lending libraries or other equipment sharing programs); reduce wasted food through donation or other sharing initiatives; expand the types of materials managed through composting, recycling, and reuse; and address a statewide need.

The EPR Packaging Program's goal is to divert packaging material from disposal towards recycling and reuse. Producers of products will pay into a fund based on the amount and recyclability of packaging associated with their products. These funds will be used to reimburse municipalities for eligible recycling and waste management costs, make investments in recycling infrastructure, and help Maine citizens understand how to recycle. This program is currently in development and is expected to be operational in 2026 with the first payments to municipalities anticipated in 2027.

Aside from Maine's new EPR Packaging Program, most of the other product stewardship programs the Department administers handle waste materials that pose challenges for disposal rather than materials that make up a large portion of the waste stream. Not counting the EPR Packaging Program, there are currently eight active product stewardship programs administered by the Department.

Generally, the Department would benefit from a better understanding of municipal roadblocks to diversion programs and welcomes public feedback on the items below, which include comments received during the course of stakeholder meetings and written comments received for consideration in this Plan.

3. Steps to Assist with Waste Reduction and Increase Recycling Opportunities

The Department currently lacks in-depth knowledge about precisely what is in Maine's municipal solid waste stream, which makes it challenging to come up with an effective and comprehensive plan to divert waste materials by type. The statewide WC Study and FLWG Study will provide a great level of detail regarding what materials are being managed as waste, which will in turn allow the Department to prioritize materials for diversion.

IV. Determination of Existing and Potential Disposal Capacity

A. Increasing Need for Disposal Capacity

Over the past five years since the previous Plan update, Maine residents, businesses, and institutions have generated roughly 1,700,000 to nearly 1,900,000 total tons of waste per year, averaging approximately 1,790,000 tons for the five-year period. This accounts for all types of waste generated within the state, such as MSW, CDD, SPW, and cover materials that are often comprised of processed waste materials, and while necessary, still take up valuable landfill space (see Table 9). This total also includes waste generated within the state that was exported outside of Maine for disposal.

Table 9. Maine Generated Wastes

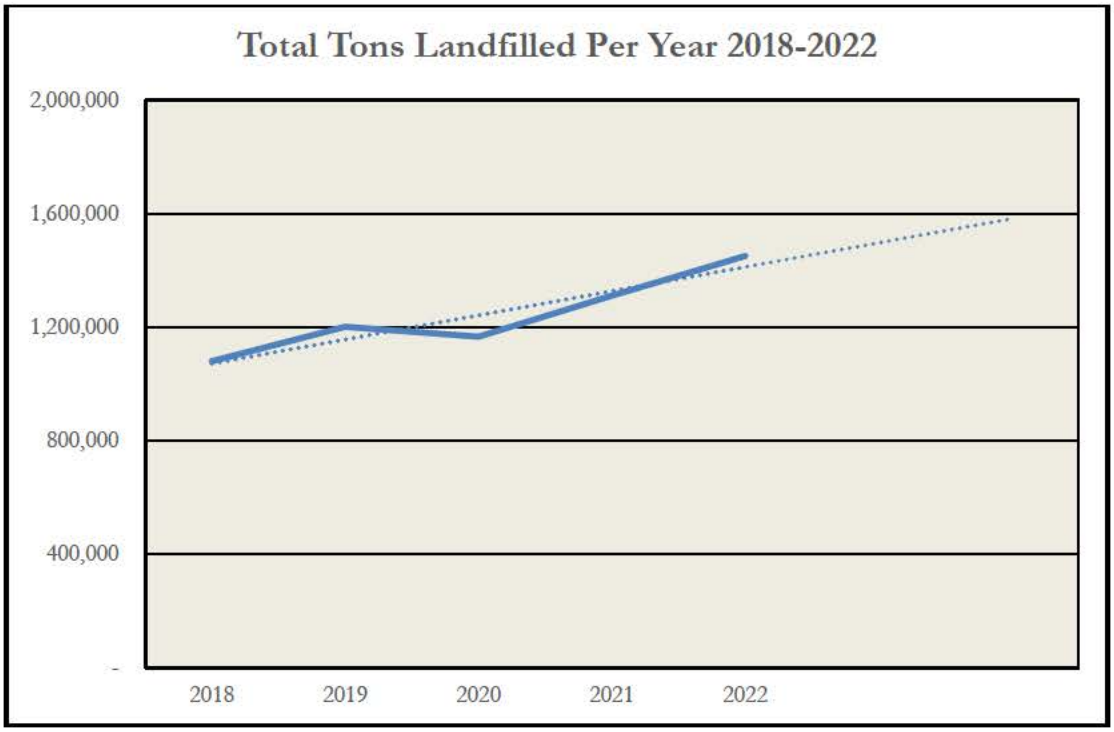
Year	MSW Landfilled[30]	MSW Incinerated	CDD Landfilled	SPW Landfilled	Cover Landfilled	Total Disposed
2018	388,629	434,652	485,362	244,706	145,128	1,698,477
2019	423,408	420,687	446,135	257,216	217,679	1,765,126
2020	498,013	441,804	461,299	308,309	153,665	1,863,089
2021	535,648	365,941	474,805	284,866	161,113	1,822,373
2022	569,911	382,609	518,410	262,646	213,458	1,785,505

The annual amount of waste generated within the state has increased by an average rate of 1.3% per year in the past five years, with a change of 5.1% when comparing 2018 to 2022. Using the year with the highest amount of waste generated during the past five years (2020) and the current rate of increase in waste generation (5.1%), the Department estimates that Maine will generate approximately 1,960,000 tons of waste in 2029, 2,060,000 tons in 2034, 2,160,000 tons in 2039, and 2,270,000 tons in 2049.

Since 2018, the total amount of waste landfilled, including the minimal amount of waste shipped to out-of-state landfills, has grown even more significantly by 34.28%. When comparing 2018 to 2022, the rate of increase was 7.8% annually. This is most likely due to several factors including: the idling of the waste-to-energy facility in Orrington; the idling of the Hampden waste processing facility, and the resultant shift of waste and recycling from those communities (as is discussed later in the report); the increase in WWTP sludge being landfilled due to the sludge land application ban; and the increase in CDD and other similar wastes being generated. Figure 4 reflects Maine-generated waste disposed in Maine landfills only.[31]

[30] This total includes Maine-generated MSW exported to landfills located in other states or Canada.
[31] This figure does not include out-of-state waste accepted at the Crossroads Landfill.

Figure 4. Total Tons of Material Landfilled in Maine from 2018-2022



Maine has eight landfills currently accepting MSW, three waste-to-energy incinerators, and one MSW waste processing facility (now called Municipal Waste Solutions). These facilities are briefly described below, including the average amount of waste received over the five-year period since the previous Plan was published.

Since generators and haulers will seek to find the most cost-effective disposal facility for their material, MSW is treated as a commodity by waste disposal facilities (including landfills and incinerators). Landfill operators will take into account market conditions for various wastes and their ability to use waste as cover material. Therefore, estimates of capacity or life beyond 5 to 10 years may not be accurate, as the volume of material accepted at a given facility can vary significantly from year to year as generators and haulers seek more cost-effective facilities and landfills change their operations. As transportation of waste is a significant factor in the overall cost of waste management, the locations and size of waste management facilities should be considered as a part of statewide waste management decision making. Figure 5 provides the location of these waste disposal facilities.

Figure 5. Landfills and Waste-to-Energy Facilities Accepting MSW in Maine

B. Current Waste Disposal and MSW Processing Facilities

1. Waste-to-Energy Facilities

There are three waste-to-energy incinerators in Maine: ecomaine in Portland, Mid-Maine Waste Action Corporation ("MMWAC") in Auburn, and the Garbage Recycling and Clean Energy facility ("GRACE")[32] in Orrington. However, the Orrington waste-to-energy facility hasn't incinerated waste since May 2023 and has bypassed significant amounts of waste due to maintenance issues over the past several years. It has instead been sending its waste for landfilling or storing it on-site. The GRACE facility will likely require significant investment to restart operations. All three waste-to-energy incinerators are licensed to accept both in-state and out-of-state waste. The total amount of waste accepted by these facilities in 2022 is shown in Table 10, and their annual licensed capacity in Table 11. The two operational waste-to-energy facilities are currently meeting their air quality emission standards and are being operated and maintained in accordance with applicable State laws, rules and Department licenses. Future capacity of these facilities is expected to remain stable, as currently licensed and constructed. As can be seen when comparing the charts, the two currently operating waste-to-energy facilities are operating at levels near their licensed capacity.

Table 10. 2022 Solid Wastes Managed by Maine's Waste-to-Energy Facilities by Origin

Facility	Maine MSW	Recycling Residue	Other Waste	Total Maine Tons	Out-of-State Waste (NH & MA)	Total Tons
ecomaine	183,654	3,2789	4,962	191,894	1,879	193,774
MMWAC	83,603	-	4,004	87,607	-	87,607
GRACE	98,162	-	4,946	103,108	547	103,655
Totals	**365,419**	**3,2789**	**13,912**	**382,609**	**2,426**	**385,035**

[32] GRACE purchased the Orrington Waste-to-Energy facility (formerly called Penobscot Energy Recycling Corporation) in November 2023.

Table 11. Available Licensed MSW Disposal Capacity at Maine's Waste-to-Energy Facilities

Waste-to-Energy Facilities	Annual Capacity	2020	2025	2030	2035
	Tons/year				
MMWAC	70,000	70,000	70,000	70,000	70,000
ecomaine	170,000	170,000	170,000	170,000	170,000
GRACE[33]	310,000	210,000	210,000	210,000	210,000
Total Capacity	**550,000**	**450,000**	**450,000**	**450,000**	**450,000**

With the waste-to-energy facility in Orrington not currently operating, approximately 210,000 tons of capacity has been lost. The majority of this material has been diverted to the JRL. As will be discussed in more detail further in this Plan, efforts to restart the Orrington waste-to-energy facility are currently underway, which would reduce the volume of waste going to Maine landfills.

2. Landfills

There are eight landfills that are licensed and currently operating that accept MSW or "MSW bypass," which is defined as MSW originally destined for a facility but diverted due to temporary capacity issues (i.e., during maintenance activities). Of these eight, six are municipally owned, one is owned by the State but managed by a contracted operator, and one is commercially owned and operated (Waste Management Disposal Services of Maine, or "Crossroads Landfill"). Also, there are 19 smaller landfills operated by municipalities that accept wood waste and CDD, and a small secure landfill that in addition to wood waste and CDD accepts WWTP sludge and other special wastes. Additionally, two municipal landfills (Rockland and Mid-Coast Solid Waste Corporation landfill in Rockport) accepted MSW during their operational history but now only accept nominal amounts of CDD, and one (Rockland) is in the process of closing and will soon no longer accept any material.

There are approximately eight generator-owned landfills that are associated with a specific manufacturing facility which are licensed to take waste only from that facility. Since the wastes disposed at these generator-owned landfills are specific to those facilities, they are not discussed in the Plan.

The amount of material each landfill accepted annually since the previous Plan was published is detailed in Table 12. The eight landfills that accept MSW or MSW bypass are

[33] GRACE's original design capacity was 310,000 tons per year which is the capacity of its two boilers operating full time. In 2020, GRACE changed its boilers' operating time, resulting in an operational reduction in waste incineration capacity to 210,000 tons annually. It is unknown whether the new owners will operate at the design capacity of 310,000 tons/year once the facility is restarted and fully operational.

discussed below, with an average amount of material the landfill received annually during the last five years. It should be noted that of the eight landfills, two, JRL and Crossroads Landfill, receive the majority of material, JRL accepting 52% and Crossroads Landfill accepting 27% of the total amount of waste landfilled in Maine. Additionally, Crossroads Landfill, as a privately owned and operated commercial landfill, can and does accept waste from out of state. The total amount of waste managed at Maine's landfills for the past five years is shown in Table 12 and illustrated in the pie chart that is Figure 5. The amount of material disposed in these landfills since the 2018 report has grown by 34.28%.

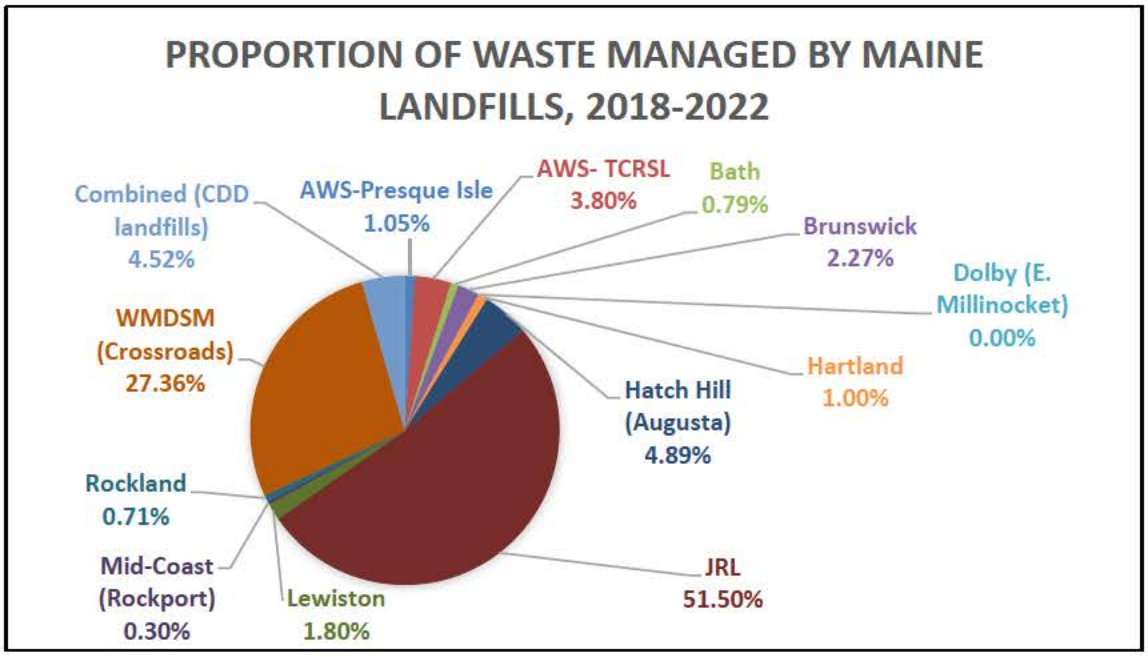
In most cases, the landfill capacity used and capacity remaining is calculated by the facility from annual physical surveys of the landfill. Therefore, capacity estimates include capacity that may have been gained by the landfill through settlement of previously disposed waste as well as capacity used by waste that was utilized as daily cover.

Landfills are frequently licensed to use a specific waste material as alternative daily cover ("ADC"). As examples, in 2020, 2021, and 2022, Crossroads Landfill used the following wastes as ADC: processed utility poles, crushed glass, CDD wood chips, ashes, contaminated soil, WWTP sludge, auto shredder fluff and some other special wastes. During the same three-year period, JRL used CDD fines and processing residues and wood as ADC. JRL is also licensed to use other wastes as ADC including ashes and contaminated soils. Some of the wastes suitable for cover, and other types of waste such as bulky wastes, are also utilized for stabilizing material like sludge. Table 12 outlines the total amount of all material that was received by these landfills for either disposal, use as ADC, or other useful purpose by the landfill. However, the ability to use material for landfill operations and for stabilizing sludge does require a more nuanced view of waste disposal. Since JRL received over 50% of material landfilled in Maine, JRL will be discussed later in more detail.

Table 12. Total Amount of Material Landfilled

Total Amount of Material Landfilled in Tons at Municipal, Commercial and State-Owned Landfills Includes MSW, CDD, and SPW (and ADC)					
	2018	2019	2020	2021	2022
AWS - Presque Isle	11,320	23,604	25,699	32,111	15,502
AWS - Fort Fairfield	41,087	29,139	37,080	31,079	47,381
Bath	8,585	7,578	5,389	15,859	23,412
Brunswick	24,580	25,062	3,966	458	-
Dolby (East Millinocket) [34]	-	-	-	416	-
Hartland	10,797	12,166	17,622	10,861	4,336
Hatch Hill (Augusta)	52,819	51,211	53,745	52,289	53,723
JRL (Old Town)	556,446	624,121	672,570	726,192	933,653
Lewiston	19,419	559	17,419	17,000	17,445
Mid-Coast (Rockport)	3,283	2,910	4,694	2,006	2,629
Rockland	7,642	1,712	6,069	18,260	1,288
WM Crossroads (Norridgewock)	295,621	370,203	263,265	332,038	301,175
Combined (CDD Landfills)	48,856	52,922	59,508	72,450	50,307
TOTAL	**1,080,456**	**1,201,187**	**1,167,026**	**1,311,015**	**1,450,850**

Figure 6. Maine Landfill Tonnage by Percent Managed



[34] Dolby is a state acquired landfill that served the papermills in Millinocket and East Millinocket that stopped accepting waste in 2021.

a. Hatch Hill, Augusta

The Hatch Hill Landfill is owned and operated by the City of Augusta. In addition to the landfill, the City of Augusta also operates a transfer station at the facility and operates as a regional solid waste facility for eight other communities. Over the past five years, Hatch Hill has received an average of approximately 52,757 tons of waste per year and is expected to reach its currently licensed capacity in approximately four to five years at current fill rates. The City of Augusta plans to apply for a vertical increase, which, at current fill rates, would provide an additional 12 to 15 years of capacity for approximately 500,000 tons of material. The City plans to submit this application to the Department in 2024 and hopes to begin construction in 2026. The City has also discussed the possibility of putting a cap on how much waste is landfilled annually if the vertical increase is constructed.

b. Presque Isle and Fort Fairfield Landfills

The Presque Isle and Fort Fairfield (formerly called Tri-Community Recycling & Sanitary Landfill) Landfills are both owned and operated by Aroostook Waste Solutions ("AWS"). AWS is operating the landfills in a manner that will reduce redundancy and provide AWS with waste disposal options for the next 40 years. Over the past five years, both landfills have received an average of approximately 29,400 tons of waste per year. The Presque Isle Landfill stopped receiving waste in 2023 and will be temporarily closed with an interim cover while AWS diverts all waste intended for landfilling to Fort Fairfield. At current waste generation rates, the Fort Fairfield Landfill is expected to provide AWS with disposal capacity until approximately 2041. After the Fort Fairfield Landfill reaches capacity, it will be permanently closed and AWS will reopen the Presque Isle Landfill, which is expected to provide an additional 17 years of disposal capacity.

c. Bath Landfill

The Bath Landfill is owned and operated by the City of Bath. It receives waste from Bath and 15 to 20 surrounding municipalities. It has received an average of 12,165 tons of material annually over the past five years, and at current fill rates is expected to reach capacity in approximately 21 years.

d. Lewiston Landfill

The Lewiston Landfill is owned and operated by the City of Lewiston. Although licensed to accept MSW, currently the Lewiston Landfill has chosen to only accept ash from the MMWAC in Auburn and smaller amounts of special waste such as grit and screenings from various sewage treatment facilities, crushed glass, and CDD. It has received an average of 14,368 tons of material annually over the past five years, and at current fill rates is expected to reach capacity in 33 years. The City of Lewiston has recently approached the Department to discuss the potential landfilling of sludge from

the Lewiston-Auburn Water Pollution Control Authority. The City intends this to be a contingency plan in case other disposal outlets are not available or feasible.

e. Crossroads Landfill, Norridgewock

The Crossroads Landfill in Norridgewock is owned and operated by Waste Management, a private company. As a privately owned and operated commercial landfill, it receives waste from outside Maine in addition to in-state waste. Over the past five years, Crossroads has received an average of approximately 312,460 tons of waste per year and was previously expected to reach constructed capacity in 2024. However, an expansion has recently been approved and Waste Management began using the expanded area in 2023. This expansion is expected to add approximately 7,757,000 cubic yards of additional capacity and expand the life of the landfill by 17 years.

f. Juniper Ridge Landfill, Old Town

The Juniper Ridge Landfill ("JRL") is owned by the State's Department of Administrative and Financial Services Bureau of General Services ("BGS") and is operated by Casella Waste Systems, a private company. JRL is licensed to accept MSW when it is bypassed ("MSW bypass") from the three Maine waste-to-energy incinerators and the Municipal Waste Solutions MSW waste processing facility in Hampden (discussed later in this report) and front-end processing waste generated by a waste-to-energy incinerator. It also accepts a variety of special wastes such as sludge, CDD and CDD processing residue, some of which it utilizes as daily cover and as a bulking agent for other wastes as discussed later in the report. It has received an average of 702,597 tons of material annually over the past five years. JRL has approximately five years of remaining capacity and has just initiated the licensing process for a proposed future expansion by submitting a Preliminary Information Report ("PIR").[35] JRL's history and waste disposal trends will be discussed in greater detail in Section IV(C) of this report.

g. ecomaine Landfill, Portland

In addition to its waste-to-energy incinerator, ecomaine operates a landfill for disposal of its incinerator ash. It previously received baled MSW before the incinerator began operation. A small portion of the landfill is used to temporarily store MSW during summer periods of higher waste generation, and the stockpiled MSW is then incinerated during periods of lower incoming waste volume. ecomaine occasionally sends MSW bypass to Crossroads or to JRL. The ash landfill has received an average of 46,832 tons of material over the past five years and is estimated to have over 50 years of capacity at current disposal rates.

[35] Required under 06-096 C.M.R. ch. 401, § 1(E).

3. MSW Processing Facility

Municipal Waste Solutions, LLC ("MWS") and the Municipal Review Committee, Inc. ("MRC") own an MSW processing facility in Hampden which is designed to process 650 tons per day of MSW from 115 municipalities that are part of the MRC. However, due to financial and technical issues that developed during construction and start-up, the facility only operated for a short period of time and has been idle since May of 2020, requiring the waste to be bypassed.

Until April 2018, MSW from the MRC municipalities was disposed at the waste-to-energy incinerator in Orrington. When construction of the waste processing facility was not completed by April 2018, MRC redirected the MSW from its member communities to the privately-owned Crossroads Landfill. MRC had negotiated an exclusive contract with Crossroads Landfill for the disposal of "bridge capacity" and bypass waste during construction, start-up, and initial operation of the facility, as applicable. Through a waste swap agreement that addressed logistical waste handling constraints to minimize waste transportation distances, some waste from the MRC communities was also diverted to JRL. Subsequent to this, some of this waste destined to be landfilled was also diverted to the waste-to-energy facility in Orrington to promote higher priority uses on the state's waste management hierarchy.

The waste from the MRC communities is still being bypassed to Crossroads Landfill or to JRL. Since April 2019 when the processing facility began accepting waste, some of the municipalities contracted to deliver their MSW to the Hampden waste processing facility began altering their recycling methods to utilize the Hampden facility's sorting process, reducing or eliminating recycling programs that separated out recyclable material from household trash. Since the recyclable portion of the waste was not collected separately or sorted out from the trash, it has been landfilled, although a small portion of recyclable material delivered to the Orrington waste-to-energy facility was pulled out from the mixed MSW before incineration.

The MRC formed Municipal Waste Solutions, LLC ("MWS") in 2022 for the purpose of purchasing the processing facility. It purchased the processing facility in 2022, and in 2023, sold 90% of the membership interest in MWS to Innovative Resource Recovery. MWS has been working on a plan for facility improvements and currently expects to restart the facility by early 2025. Until the MWS facility is fully operational for a complete calendar year, it will not be possible to assess whether the amount of bypass and processing residue resulting from its operations will significantly alter the amounts of solid waste destined for landfilling.

4. Materials Recovery Facilities

It should be noted that two materials recovery facilities ("MRFs") operate in Maine. A MRF is a facility that processes single stream recycling materials to be sold to end buyers. ecomaine operates a MRF in Portland, and Casella operates a MRF in Lewiston. These facilities are also an integral part of Maine's solid waste infrastructure.

C. Juniper Ridge Landfill's Role in Maine's Waste Disposal Arena

As shown in Figure 5 above, the State-owned Juniper Ridge Landfill has received slightly over 50% of all waste material landfilled in Maine since 2018. Given its significant role in waste management in Maine and the fact that it is a State-owned resource, the Department has provided the following information regarding its history and role in waste management for the State to assist with decision making.

P.L. 1989, Chapter 585, *An Act to Promote Reduction, Recycling and Integrated Management of Solid Waste and Sound Environmental Regulation* established a comprehensive framework for solid waste management in Maine. Included were provisions that established the Solid Waste Management Hierarchy, a ban on new commercial disposal facilities, public sector responsibility for ensuring disposal capacity for MSW, and state authority to develop and operate state-owned solid waste disposal facilities. These provisions were intended to provide the State with tools to encourage diversion of solid waste from landfilling and minimize the need for the development of additional landfill capacity.

Since the enactment of this law, the State has established ownership of three licensed landfills: the yet-to-be-developed Carpenter Ridge Landfill with a design capacity of 1.8 million cubic yards, the inactive Dolby Landfill in East Millinocket which is in the process of final closure, and JRL in Old Town. When obtained by the State, the licenses for each of these landfills were focused on providing disposal capacity for special wastes associated with the paper mills that operated them at the time. In April 2004, the State, acting through the State Planning Office, received a license amendment (Department License #S-020700-WD-N-A) that provided for the acceptance of additional waste types at JRL (then known as the "West Old Town Landfill" or "WOTL"), including: front-end process residue ("FEPR") from the then-owned PERC and the Maine Energy Recovery Company ("MERC") waste-to-energy incinerator in Biddeford (now closed); oversized bulky wastes ("OBW"); MSW bypass from any waste-to-energy incinerator located in Maine; CDD; ash from any waste-to-energy incinerator located in Maine; and water/wastewater treatment sludge. Finding of Fact 13 in that license states that "[t]he yearly quantity of solid waste to be accepted at the landfill is not expected to exceed 540,000 tons per year." This amount is inclusive of up to 50,000 tons per year of mill wastes from the Old Town papermill, 120,000 tons of FEPR and 70,000 tons of ash from two waste-to-energy incinerators (then operating PERC and MERC), and 190,000 tons of CDD. In December 2013, WOTL (now known as JRL) was licensed (Department License #S-020700-WD-BC-A) to accept up to 81,800 tons of non-bypass MSW generated in Maine into its existing permitted landfill area. This amendment was sought to provide a temporary alternative (through March 31, 2018) for disposal of MSW generated in municipalities that had been sending their MSW to the MERC facility in Biddeford prior to it ceasing operations in December 2012. In June 2017, the State, acting through BGS received approval for a 9.35-million-cubic-yard expansion. In 2018, the approval to accept up to 81,000 tons of non-bypass, in-state MSW was extended through March 31, 2020, to account for the near-term uncertainty in disposal capacity due to operational adjustments at the Orrington waste-to-energy facility and the delay of operations of the MSW waste processing facility in Hampden.

The data show significant changes in the types of waste being landfilled at JRL in 2022 compared with 2012. There has been a substantial drop in FEPR and MSW incinerator ash due

to the closure of the MERC facility and the curtailing of operation at the Orrington Waste-to-Energy facility, as well as industrial WWTP sludges and papermill wastes due to the closure of the papermills in Old Town and Lincoln. However, the fill rate at JRL has climbed due to significant increases in the disposal of MSW and more recently municipal WWTP sludge. For example, MSW increased from 729 tons in 2012 to 283,683 tons in 2022 and CDD[36] increased from 369,069 tons in 2012 to 485,298 tons in 2022. Likewise, the disposal of municipal WWTP sludge from 53,023 tons in 2018 to 94,271 tons in 2022 has also increased the fill rate at JRL. Although waste volumes fluctuate year-by-year, the overall trend is a marked increase in material accepted for disposal.

Much of the large volume of CDD landfilled at JRL comes from processing facilities located in Maine. Although 38 M.R.S § 1310-N(11) prohibits the disposal of waste generated from out of state directly into state-owned waste disposal facilities, it allows "waste generated within the State" to include "residue and bypass generated by incineration, processing and recycling facilities within the State," all of which may include waste originating from locations out of state before it gets to the processing/recycling/incineration facilities. Notably a significant amount of Maine's CDD originates in Massachusetts due to a ban on the disposal of CDD in Massachusetts.[37] This has resulted in a large volume of out-of-state CDD being processed by waste processing facilities in Maine with the processed fines being placed in the landfill as shaping, grading or alternative daily cover materials, and residual CDD being disposed of into JRL as in-state waste.

To better address the issue of JRL using up capacity to accept wastes that are not originally generated in Maine, the legislature enacted several requirements for processing facilities. First, the definition of "waste generated within the state" under 38 M.R.S. § 1303-C(40-A) was modified. Under this definition, the total weight of residue generated in a calendar year by a solid waste processing facility that is disposed of or otherwise placed in a solid waste landfill in that calendar year cannot exceed the total weight of the solid waste initially generated in state for processing at the facility. Any excess residue generated by that facility is not considered waste generated within the State. In addition, 38 M.R.S. § 1310-N(5-A)(B)(2) requires that all processing facilities that generate residue for disposal must recycle at least 50% of the CDD they accept. In doing so these facilities are allowed to count the following toward recycling: "reuse of waste as shaping, grading or alternative daily cover materials at landfills; aggregate material in construction; and boiler fuel substitutes." Once this 50% goal is met, the processing facility is then required to demonstrate that of the material characterized as recycled, at least 50% of it must have been recycled or reused "other than being placed in a solid waste landfill," unless the processing facility qualifies for specialized criteria allowing for alternative percentages under 38 M.R.S. § 1310-N(5-A)(B)(2)(a-e).

[36] These numbers may be higher than those reported in the past as they include a more complete array of construction and demolition debris and processing residues: OBW, wood, mixed CDD, CDD processing residue and fines, mixed MSW/CDD processing residue, and crushed glass.

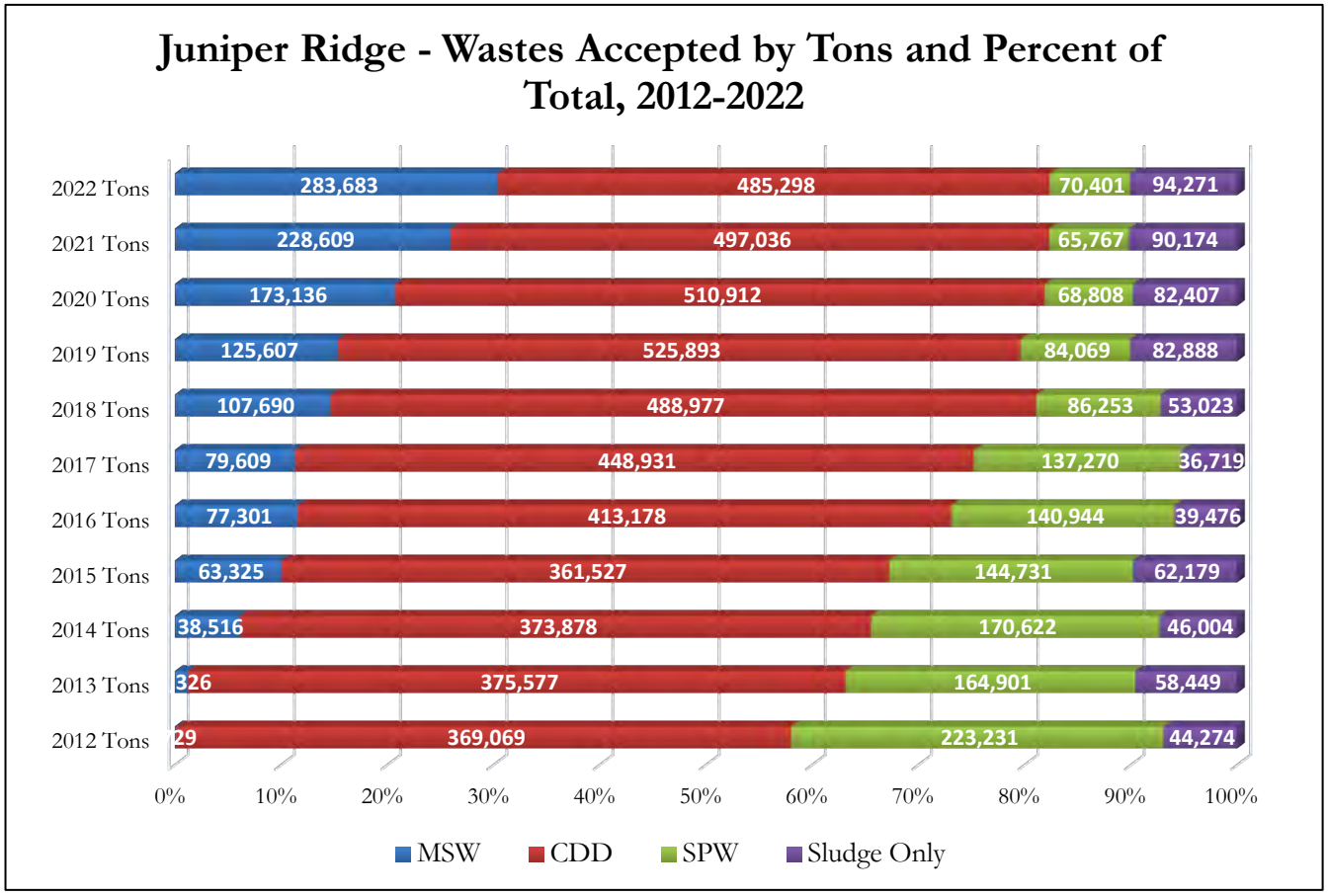
[37] https://www.mass.gov/doc/frequently-asked-questions-construction-demolition-materials-waste-ban/download.

The discovery of PFAS in municipal WWTP sludges and other sludge-derived products banned from land application in Maine have made JRL the landfill of choice for final disposition of this material, which has had a significant impact in recent years on its capacity. Beginning in August 2022, most municipal WWTP sludge generated in Maine was disposed of at JRL. The physical nature of sludge makes landfill disposal challenging and can affect both the short-term and long-term stability of a landfill. Stabilizing materials need to be mixed with the sludge, adding an additional volume of material for disposal and taking up valuable landfill space. CDD, CDD residue and other similar material, and OBW have been utilized as bulking material for stabilization. These additional bulking materials compounded by sludge volumes have shortened the timeframe by which JRL is expected to reach its maximum capacity.

While Crossroads Landfill also takes sludge from Maine's WWTPs (albeit a smaller volume), it also has concerns about the quantity of sludge it takes in relation to moisture and the need for operational stability. As a result, Crossroads Landfill has determined the best path forward to maximizing capacity is to invest in sludge drying. Sludge can be dried to reduce its volume and its need for bulking agents for stability. On September 15, 2023, Crossroads Landfill submitted an application to the Department for a waste processing (sludge drying) facility which, if approved, will be licensed to receive approximately 200 tons of municipal WWTP sludge daily, greatly reducing the overall volume of this waste stream for disposal down to roughly 50 tons. The dried material will then be landfilled without the need for significant bulking materials. The proposed new facility is planned to run on heat pump technology and utilize the biogas generated at the nearby landfill, reducing the energy demand needed for processing sludge. This model, if successful could serve as a model or prototype for other facilities accepting WWTP sludge including other landfills. Investing in sludge dewatering facilities and/or focusing on PFAS treatment and destruction technology as identified in the Bureau of General Service's Study to Assess Treatment Alternatives for Reducing PFAS in Leachate from State Owned Landfills may be a far more sustainable option in the long run than continuing to landfill larger amounts of CDD in order to accommodate landfilling of sludge. The current trajectory of sludge and CDD disposal encourages the expansion and use of landfilling, and without alternative options, Maine's landfills will likely fill up more quickly than originally planned for.

The following figures provide an overview of waste material types received at JRL and how they have changed over the past 10 years. Figure 7 provides an outline of waste material types as a percentage of total waste received per year since 2012, Figure 8 provides an outline by tonnage received per year since 2012, and Figure 9 provides an overview of total amount of waste received by tonnage and percentage since 2012.

Figure 7 – Wastes Accepted at Juniper Ridge Landfill by Percent of the Total Accepted[38]



[38] While sludge is a special waste, this graph depicts it as its own category pulled out from the rest of the special waste (SPW) to show the sludge as a percent of the incoming wastes over time.

Figure 8. Wastes Accepted at Juniper Ridge by Tons and Type

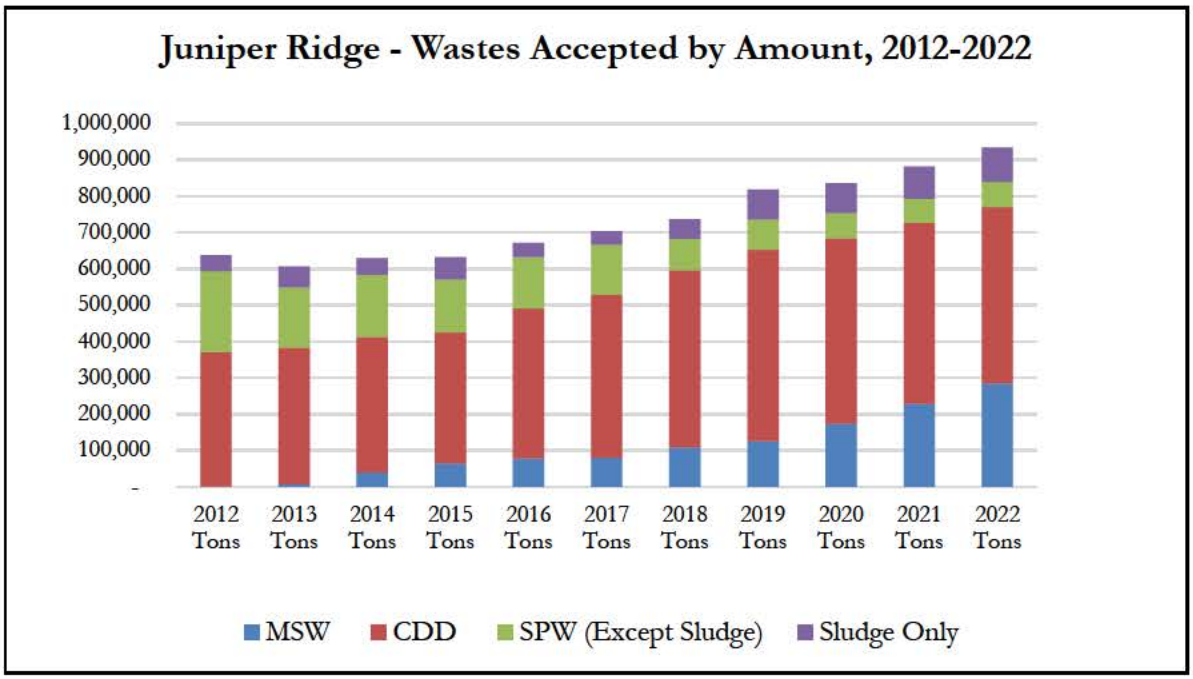
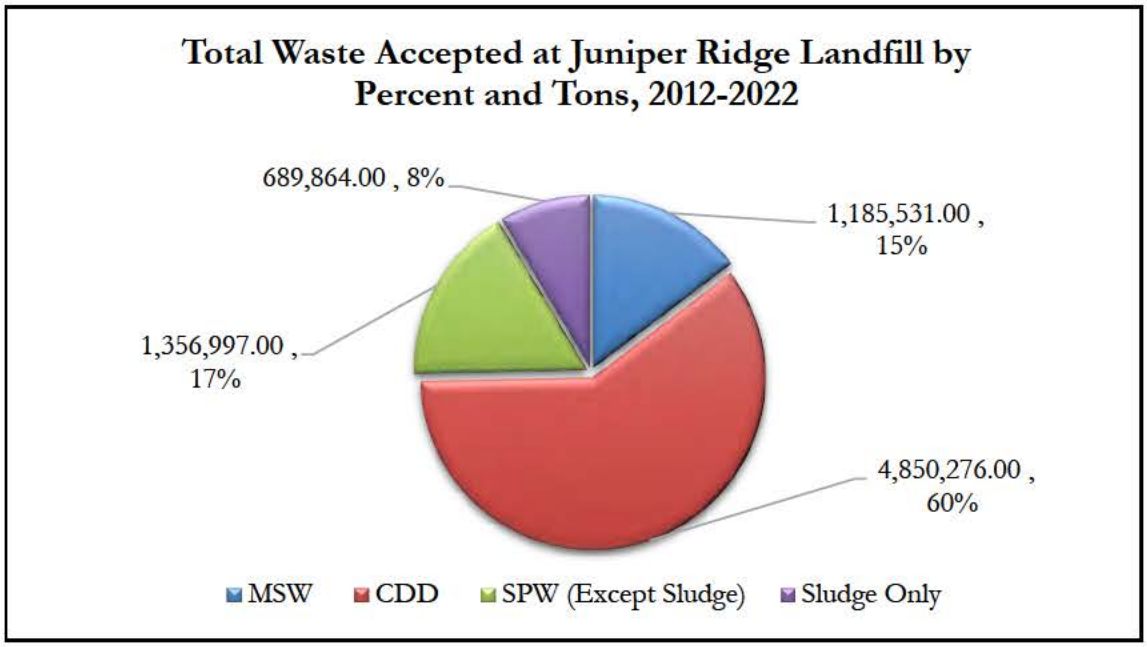


Figure 9. Total Tons Accepted at Juniper Ridge by Percent 2012-2022



While not intentional, JRL has in effect become Maine's fastest and most economical solution for handling emerging solid waste issues. Given the increasing quantities of wastes being landfilled at JRL, expansion of this landfill is a critical solution that will be necessary in addition to proactive steps to increase waste infrastructure options as well as enhancing efforts toward meeting statutory waste reduction, diversion, and recycling goals. Difficult decisions will need to be made about the overall purpose and use of this state-owned landfill, how to maximize its capacity and lifespan, whether to invest in alternative infrastructure for waste disposal at other locations, and how market pressures can be modified to encourage waste diversion programs.

D. Projected Demand for Capacity

Currently, there are significant gaps in Maine's Eastern Maine region for managing MSW. Investment activity[39] focused on restarting both the idled Orrington waste-to-energy incinerator and the Hampden solid waste processing facility are underway, but uncertainties remain with regard to, operating timeframes, financial barriers, and long-term capacity. Should either of these facilities begin operations, the concerns about how to cost effectively manage MSW in the region should ease. However, at the current time MSW is bypassing from both facilities going directly to landfills. JRL will likely continue to be the recipient of most of this MSW stream over the next few years as it is closest in proximity to the region impacted (logistics and transportation make this more cost effective). It should be mentioned that both of these facilities while currently operating do fall higher up on Maine's solid waste management hierarchy.

Statewide, other than the issue specific to Maine's Eastern Maine region, Maine appears to have adequate capacity for at least 10 years before several landfill facilities reach their capacity. This assumes however that an expansion license application is both received by and approved by the Department for the JRL facility. As of the date of this report, the Department has received a PIR from JRL for a future expansion.[40] The loss of JRL as a disposal facility would create catastrophic capacity issues as it receives over 50% of all material landfilled in Maine annually. If JRL moves forward with its application for an expansion, the projected capacity at current fill rates would most likely add an additional 15 to 20 years, which at the earliest brings it to being at capacity once again in 2042.

Even with capacity available statewide for the next 10 years, unless significant progress is made in ensuring that the state has existing or new infrastructure for waste processing and disposal, as well as enhancing waste diversion programs, landfill capacity will become an even more pressing issue in 15 years. For example:

- If the application for expansion for the Hatch Hill Landfill is approved, Hatch Hill will reach its estimated capacity in 12 to 15 years. This means that as early as 2035, Maine will lose approximately 50,000 tons of waste disposal capacity.

[39] The new operators taking over the Orrington waste-to-energy incinerator have renamed the facility, "Garbage Recycling and Clean Energy" or "GRACE" and plan to resume full operation of the facility. See: https://www.bangordailynews.com/2023/11/27/news/bangor/orrington-trash-incinerator-restart-operations-joam40zk0w/.

[40] In the past licensing for the JRL facility from start to finish has taken approximately six years.

- Crossroads Landfill is expected to reach the capacity of its recent expansion in 17 years, putting its operations until about 2040. This will substantially impact Maine's waste disposal capacity as this landfill accepts on average about 300,000 tons annually (although some of this comes from out-of-state).

- Bath Landfill is expected to reach capacity in 21 years, allowing its operations until 2044. The loss of the Bath Landfill will have a relatively minor impact to Maine's overall waste disposal capacity, as that landfill receives only approximately 12,000 tons of material annually.

- The loss of the Hatch Hill and Bath landfills, in particular, will impact disposal options for the Central Maine region in about 15-20 years.

As with all of these landfills, landfill operators can extend the life span of their landfill by turning away or not accepting wastes. This will pose additional challenges to generators of solid waste who may need to seek alternative disposal outlets which may be farther away and cost more to access. These costs likely will be passed on to municipalities in most cases, which in turn will pass costs on to Maine residents.

To extend operating time to Maine's existing landfills, it is important not just to evaluate landfill expansions, but also to consider how to bring new or licensed but non-operating facilities online more quickly. This is a critical need as it currently takes several years from the beginning of the licensing process to the end when construction and operation are allowed to take place. Long-term disposal capacity is a significant and valid concern. With the exception of Aroostook County, which appears to have landfill capacity for a minimum of 40 years, it is clear that if considerable reduction in the amount of material going to landfills is not achieved, or unless new technology and infrastructure is brought online in multiple locations in Maine, a sizeable portion of Maine's landfill capacity will be gone within 20 years. Maine's increases in waste generation as discussed in Sections III and IV above, indicate that this timeframe could be even shorter. Costs related to hauling MSW, CDD, recycling material, salvageable material, compostable food waste, and other waste streams are a significant portion of the overall cost for the management of this material, in addition to its greenhouse gas emissions impacts. These costs will likely be passed on to Maine residents and communities.

As Maine evaluates adding new infrastructure and enhancing existing waste diversion programs, it is important to consider locating facilities near areas where waste material is generated, utilizing regionalization, and implementing "hub and spoke" models for transferring waste material to make hauling more efficient and cost effective. In addition to practical issues associated with managing an increased amount of waste over time and maximizing existing and new infrastructure, it is important to recognize that many waste streams that could be diverted are being disposed of because disposal is often the lowest cost option. There is a clear need for a market readjustment to incentivize more sustainable materials management to maximize long-term disposal capacity and increase efficiencies in our management of materials.

V. Stakeholder Input Summary

The Department has encouraged public input on the contents of this Plan update as well as the direction of future materials management efforts by holding five public meetings across the State in Aroostook, Washington, Penobscot, Kennebec, and Cumberland counties. The meetings were held both in person and online to encourage participation. Meeting recordings were posted on the Department's website and written comments were accepted by email. Attendance at each of the meetings ranged from five to approximately twenty participants. The Department received nine written comments submitted through email.

Discussion was encouraged by a series of prepared questions specific to current materials management practices as well as broadly scoped questions regarding desired improvements. Not surprisingly, discussion ranged from logistical issues of a more local or regional nature to issues common to the State at large. Issues identified as common across the State included lack of drop-off locations for materials covered by current producer responsibility programs, lack of feedback on municipal reporting, and inconsistent availability of public information regarding programs and best practices to manage various discarded materials. Reliance of the state on meeting waste capacity needs through disposal rather than diversion efforts was a common concern. Additionally, participants discussed a desire for the Department to increase its efforts in communication in many of the aspects of waste management, from increasing information availability on individual facilities to providing information on recycling opportunities and handling problematic materials.

A. General Concerns of Maine's Waste Management System

Overall, a consensus emerged supporting greater effort in the top two tiers of Maine's Solid Waste Management Hierarchy; reduce and reuse. While waste reduction may be the hardest to measure, it remains the highest priority. Reuse is more tangible and yields a myriad of positive impacts. Examples of reuse candidates mentioned by attendees included pellet bags (deposit), refillable beverage containers, water dispensers in lieu of bottled water, 1-lb. propane canisters (refillable in CA, MA, RI), repair cafés (already emerging around the state), tool libraries (sharing), and reuse stores.

In each of the five public forums held, the Maine Waste Management Agency (and after 1995, the State Planning Office) ("MWMA/SPO") were both mentioned for the fact that they no longer exist, and the bulk of their tasks were not picked up by the Department or other agencies. Attendees discussed how the MWMA/SPO was a driving force in bringing "reduce, reuse and recycle" into common parlance throughout the state from the late 1980s on. It not only administered a robust grant funding program for waste infrastructure throughout the state, but it also tracked progress toward overall waste reduction goals set by the Legislature through staff providing a high level of assistance to municipalities in filing annual reports to MWMA/SPO. Staff were tasked with not only seeing that each individual facility's recordkeeping was adequate and reports were filed on time but, perhaps most importantly, providing feedback to the facility managers regarding shortfalls and best management practices.

A significant number of those attending stakeholder meetings expressed a degree of angst regarding the future of JRL, the incinerator in Orrington, and the long-delayed waste processing facility in Hampden. It was recognized that currently, landfilling and waste-to-energy

incinerators are the foundation on which all else in waste management rests. A concern was expressed that materials diverted from landfilling by successful recycling and other diversion efforts will be replaced at JRL with wastes sourced from out-of-state.

The different levels of waste management services provided by the municipalities throughout the State was another topic of concern. Rural Maine has become a mosaic of differing collection programs from one town to the next. While all municipalities and unorganized areas have some sort of household waste disposal option, not all municipalities have a robust recycling program, and some offer no recycling at all. As a result, many communities do not have the necessary infrastructure to participate in longstanding producer responsibility programs to allow for free or reduced-cost collection of e-waste, mercury-containing light bulbs and thermostats, architectural paint and rechargeable batteries. Further, some rural communities have signed onto expensive curbside collection programs with little consideration for collaboration with neighboring towns. Without collaboration, duplicative efforts within a region lead to less-than-optimal costs and greater vulnerability to market changes. It also makes determining whether a program is successful in terms of recycling and waste diversion difficult.

Concern was expressed that vertically integrated private companies have gained disproportionate control of waste management and recycling services, particularly in rural areas. This appears to be a common issue when municipalities approach such services on an individual rather than a regional manner, as there is less leverage to negotiate contract terms and prices. When opting out of collaborative regional transfer stations, municipal flexibility, control, and choice are more limited. Attendees also expressed concerns that small, independent towns are forced into restrictive or predatory-appearing contracts for transport, recycling, processing, and disposal due to lack of true competition for such services.

B. Solutions Suggested to Maine's Waste Management System

Attendees at the public meetings proposed several recommendations for addressing waste management issues, as discussed below.

1. Promote regionalization for new, more efficient waste transfer and recycling facilities.

Whether at the county level or as a result of nearby municipalities working together, it was discussed that regional facilities could provide more sophisticated governance over service contracts as well as offering expanded services to residents that curbside programs cannot manage and small municipalities may struggle to offer on their own.

2. Facilitate universal waste and other problematic waste collection in new regions.

E-waste, mercury-containing items, paint, and rechargeable batteries have long been collected in some areas of the State, but due to lack of collection locations, these programs are not readily available to all. Municipalities could be collection points, but many choose not to. In place of developing a collection facility in each rural municipality, a central collection facility for neighboring rural communities would be more efficient and could be as simple as placing one or more properly sized shipping containers (or a similarly sized storage container) in a host community, with oversight and controlled access to ensure the site is used for its intended

purpose. Oversight of a collection location could be under a fire department, town office, or public works department. Such programs could be developed with funds dispersed through the State's Waste Diversion Grant Program. Program creativity could expand such a collection system to include other recyclables or organics, as well as offering information kiosks regarding programs and opportunities for sustainably managing wastes.

3. Clearly prioritize regionalization and boost funding for Maine's Waste Diversion Grant Program.

While the current grant program has been quite successful at awarding organics diversion grants up to $40,000 per grantee, there was a concern expressed that there have been few proposals to fund regional solutions in rural areas. It was also suggested to consider streamlining grant applications for regional organizations, which, along with municipalities, are designated as the highest priority in the awarding of funds under 38 M.R.S. § 2201-B.

4. Phase in mandatory food waste recycling with incremental requirements.

A strong desire was expressed to start phasing in a mandatory food waste recycling program. While sufficient infrastructure is not currently in place for collection, transportation, and processing of organics, a phased approach to preventing wasted food and recycling food scraps will allow for planning, investment, and implementation over a period of time that would allow successful regional programs to develop. Attendees noted that participation in such diversion programs needs encouragement beyond simply being informed of its benefits. It was also noted that Vermont, New Hampshire, Massachusetts, Rhode Island, and Connecticut all have some sort of mandatory organics recycling or food waste disposal bans in place.

5. Broaden battery collection to include a larger array of batteries.

Attendees pointed out that the market is moving towards electric powered tools and yard equipment, reducing use of fuel and the related GHG emissions from combustion-powered tools. However, lower quality tools may be treated as "disposable" (rather than repairable) and often end up, batteries attached, in landfills or at recycling facilities where they can cause fires, endanger workers, and waste valuable resources. Attendees suggested that a deposit at the point of purchase or an expansion of the current rechargeable battery stewardship program would be a reasonable starting point to address this important safety risk and improve the recovery of critical minerals contained within batteries and the devices and tools they power.

6. Promote deconstruction of buildings over demolition.

To address the concern regarding the amount of CDD being placed in landfills, attendees discussed incentivizing salvaging and reuse. Attendees noted that CDD consumes a lot of landfill space. Utilizing salvageable materials from construction and demolition sites has the potential to lower demand for virgin materials, conserve higher quality materials, make affordable recovered materials available for reuse, and create local jobs. Deconstruction

provides a significant tax benefit when a property is correctly appraised,[41] and could be further encouraged through educational material for property owners, local ordinances, municipal tax credit programs, or the establishment of a directory for services and purchasable salvaged materials.

7. Discourage single-use food service ware and promote reusable alternatives.

Attendees discussed a desire to develop a grant program or a revolving loan fund specific for commercial and institutional reuse programs, such as washing equipment to scale up reuse programs on a regional basis. Restaurants and schools utilize large quantities of single-use food service ware, mostly made of plastics, for takeout and cafeterias. The useful lifespan of single-use plastic items averages just 15 minutes,[42] and its carbon footprint is significant for such a limited use item. If a school with 500 students (the average school size in the U.S.) replaced what is perceived to be a more sustainable option, such as compostable food containers with reusable food service ware, it would prevent 6,786 pounds of waste annually and the corresponding reduction in carbon dioxide emissions would be equivalent to taking nearly 800 cars off the road.[43]

8. Develop a field task force for materials management.

It was noted that the former MWMA/SPO employed a trained team that would review commercial and industrial facilities and institutions to make informed, situation-specific recommendations on waste reduction, reuse, and recycling. Attendees expressed interest in rekindling a similar program that would also train any interested and qualified parties to conduct such reviews. The data collected by this team could be used to develop a directory to post no longer needed materials generated in northern New England that could add value to another process, identifying and expanding the potential for industrial symbiosis.[44]

9. Right to Repair to encourage industry to produce repairable, durable goods.

Many attendees lamented that durable goods are not so durable anymore, and that greater public education focused on purchasing repairable, durable goods has significant potential to reduce how much waste is generated through the consumption and disposal of poor-quality goods. Possible steps identified to tackle this issue included use of a repair rating for durable products, or the development of an income-based rebate system for purchases of long-lasting, durable goods that are repairable. Such an index exists in France[45] and provides an existing baseline, although certain products available in the U.S. may not be rated by the French repairability index.

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[41] See: https://www.thegreenmissioninc.com/assets/deconstruction-material-and-property-appraisal-issues-in-22.pdf and https://www.thegreenmissioninc.com/assets/appraiser-appraisal%20updated-article.pdf.
[42] See: https://www.qld.gov.au/environment/circular-economy-waste-reduction/reduction/plastic-pollution/single-use-plastics-guide#:~:text=Single%2Duse%20plastics%20have%20helped,usable%20lifespan%20of%2015%20minutes.
[43] Vanderlip, C. (2023, January 3). School cafeterias use tons of single-use containers that go to landfill. Here's how to change that. *Fast Company*. https://www.fastcompany.com/90828505/school-cafeterias-single-use-packaging-waste-circular-economy-reuse.
[44] See: https://nordregio.org/nordregio-magazine/issues/industrial-symbiosis/what-is-industrial-symbiosis/.
[45] See: https://www.indicereparabilite.fr/.

10. Education of youth to instill environmental awareness around waste management, recycling, and reuse.

It was discussed that many people do not understand how the waste management system works, even though everyone contributes waste to it. Education in schools about such systems and the environmental impacts of materials management would be useful. The Maine Climate Hub already provides multiple relevant lessons.[46] To help support further development and inclusion of materials management curriculum for K through 12, attendees suggested providing funding or grants for continued development of grade-appropriate environmental science material related to waste management.

11. Improve collection of household hazardous waste statewide.

Lack of HHW collection was a major concern and attendees would like to see permanent collection points in each county for HHW. It was mentioned that Vermont recently passed a stewardship program for household hazardous waste and suggested that Maine should consider a similar program.

12. Streamline municipal reporting.

Several attendees discussed that, from the municipal perspective, the current transfer station and municipal recycling progress reports and reporting systems are repetitive and inefficient. Streamlining reporting will allow for more efficient data collection, management and analyses and streamline the process of making data available to the public to aid in decision making for waste management.

13. Citizen input and participation.

Several attendees articulated a desire for the State to create and fund staff for a Citizens Advisory Group to act as a review and information outlet for waste management issues.

VI. Future Strategies

The Department is looking forward to evaluating data once its comprehensive assessments are completed. The Department anticipates these studies will provide the data necessary to target the components of the waste stream that will be most impactful toward reaching Maine's recycling and waste diversion goals. The Department will then be able to make recommendations regarding Maine's infrastructure for recycling, composting, diversion efforts, processing and disposal, and also for appropriately managing municipal WWTP sludge.

The strategies below are based on the information available at the time of the publication of this Plan and include input from the public. While the Department does not have enough information at this time to provide recommendations, the Department has observed some strategies that are worth considering right away. These include:

[46] See: https://maineclimatehub.org/.

1. Evaluating the concept of subsidies for waste-to-energy incinerators, anaerobic digestion facilities, or other facilities/processes that can reduce the volume of waste requiring landfilling. Subsidies could be structured either to incentivize construction or expansion of facilities or to subsidize the cost of managing materials/processes other than landfill disposal.

2. Coordinating or partnering with the Finance Authority of Maine for tax incentives or low-interest loans, as available, to develop infrastructure for waste diversion.

3. Considering statewide unit-based pricing, also known as "pay as you throw" to make disposal costs more equitable and provide a financial incentive to reduce waste and increase recycling.

4. Creating subsidies or assistance for food rescue for businesses and other generators or food scrap collection for municipalities.

5. Strengthening participation in existing product stewardship programs for safer, more affordable materials management across the state.

Maine-specific concepts identified by the Department during the stakeholder meetings:

1. Provide additional assistance to municipalities in meeting recycling and waste diversion goals by highlighting reimbursement to municipalities and funding for infrastructure development through the EPR Packaging Program as well as existing opportunities through the Waste Diversion Grant Program.

2. Incentivize reuse, repair, refill, in reducing overall waste generation and the need for prioritizing these actions to conserve resources and reduce emissions while acknowledging the need for and importance of continuing to support and build out infrastructure for recycling and composting.

3. Increase education efforts and cooperative work on reuse, refill, waste reduction, recycling, organics management.

4. Encourage regionalization between municipalities and counties through subsidies. Regional systems could form a "hub and spoke" model for more efficient handling and transportation. Regional facilities could receive subsidies to accept all recyclables, universal waste, and take responsibility for one collection event for HHW, electronics, and other problematic material.

5. Encourage or make requirements for lessors of multifamily housing to provide for the collection of recyclable waste and not force renters to just dispose of wastes.

6. Encourage expansion of "right to repair" to increase the life span of consumer products. Since December 2022, New York, Minnesota, Colorado, and California have passed right to repair bills covering electronics, appliances, and agricultural equipment.

Future planning must also take into account the rural nature of much of Maine. Waste management costs are dependent on economies of scale, whether it be hauling material, processing, or disposal. The more material collected, and the more people serviced, the lower per capita costs will be. The relatively low population density of portions of the state generally drives up the per capita costs for

providing services to those areas. The State may need to provide incentives in order to entice waste facilities and operators to locate in and provide services to portions of the state with lower population densities. Not doing so will create underserved areas of the state compared to more populous areas.

VII. Conclusions

As shown by the data presented in this report and in the Waste Generation and Disposal Capacity Reports published by the Department since the previous Plan update in 2019, Maine has not been making progress towards reaching its waste diversion and recycling goals. The amount of MSW and CDD Maine generates annually has increased, the amount of waste material Maine is landfilling has increased, and the rates of recycling and waste diversion has remained, at best, stagnant in some areas of the state and has decreased in others.

Additionally, Maine has lost capacity in regard to waste-to-energy options due to the idling of one of its three waste-to-energy incinerators. If the facility is not successfully restarted, the permanent loss of that facility would further limit disposal options in Maine. Although Maine's landfill capacity appears adequate for the next 15 years (assuming that the JRL facility is licensed for expansion), after that time period landfill capacity will be quite limited. The only secure spot in Maine's waste arena in terms of capacity is the Northern Maine area, in which AWS appears to have adequate landfill capacity for its regional population for at least 40 years.

The Department anticipates a significantly improved understanding of Maine's waste stream once the aforementioned WC Study, FLWG Study, and Biosolids Study are completed and evaluated. As an example, the Department anticipates that textiles, which have been identified as the fastest growing waste stream in the country,[47] will also be noted as a material of concern in the composition of Maine's MSW stream. The WC Study will provide clear data regarding how much of Maine's waste stream is comprised of such material currently, and target diversion efforts. While it is clear that further action is needed to ensure that Maine's waste reduction and recycling goals are met, and that Maine maintains long-term disposal capacity for waste that needs to be disposed, gathering and analyzing the data being generated by these studies is imperative for sound and economically driven decision making moving forward.

One issue that is apparent from the currently available data is that approximately one-third of the volume of material landfilled in Maine is CDD, CDD residue, wood waste, and other similar material. While some of this material is utilized by the landfill as cover material and other uses such as bulking material for municipal WWTP sludge, much is also being landfilled. Steps should be taken to further reduce the amount of CDD being generated, increase diversion and recycling, and assure when landfilling is necessary that advantageous use of this material at the facility is maximized (i.e., as cover and bulking), minimizing the amount placed in landfills merely as waste. Repurposing of CDD also holds significant economic opportunity, with the potential to support new education pathways, as well as job growth and a new avenue for small businesses.

[47] See: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1500-207.pdf.

The cost of transportation has been mentioned in stakeholder meetings as a major factor in materials management around the state for both waste disposal and diversion programs such as recycling and organics management. It is clear that more regionalization is needed and determining how to best foster such regional partnerships is an ongoing process for the Department.

APPENDICES

Appendix A: Maine's Solid Waste Management and Food Recovery Hierarchies

§ 2101. Solid Waste Management Hierarchy

1. Priorities. It is the policy of the State to plan for and implement an integrated approach to solid waste management for solid waste generated in this State and solid waste imported into this State, which must be based on the following order of priority:

   A. Reduction of waste generated at the source, including both amount and toxicity of the waste;

   B. Reuse of waste;

   C. Recycling of waste;

   D. Composting of biodegradable waste;

   E. Waste processing that reduces the volume of waste needing land disposal, including incineration; and

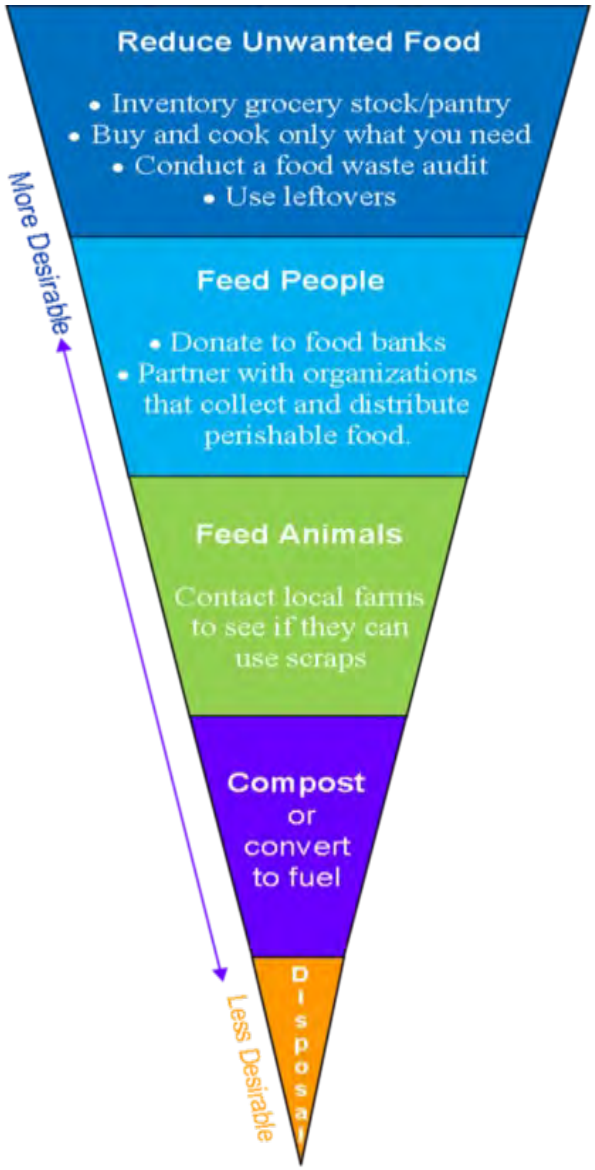
   F. Land disposal of waste.

It is the policy of the State to use the order of priority in this subsection as a guiding principle in making decisions related to solid waste management.

2. Waste reduction and diversion. It is the policy of the State to actively promote and encourage waste reduction measures from all sources and maximize waste diversion efforts by encouraging new and expanded uses of solid waste generated in this State as a resource.

§ 2101-B. Food Recovery Hierarchy

1. **Priorities.** It is the policy of the State to support the solid waste management hierarchy in section 2101 by preventing and diverting surplus food and food scraps from land disposal or incineration in accordance with the following order of priority:



A. Reduction of the volume of surplus food generated at the source;

B. Donation of surplus food to food banks, soup kitchens, shelters and other entities that will use surplus food to feed hungry people;

C. Diversion of food scraps for use as animal feed;

D. Utilization of waste oils for rendering and fuel conversion, utilization of food scraps for digestion to recover energy, other waste utilization technologies and creation of nutrient-rich soil amendments through the composting of food scraps; and

E. Land disposal or incineration of food scraps.

2. Guiding principle. It is the policy of the State to use the order of priority in this section, in conjunction with the order of priority in section 2101, as a guiding principle in making decisions related to solid waste and organic materials management.

Appendix B: List of MSW and CDD Categories and Sub-sorts for a Statewide Waste Audit

Category		Sub-sorts
Paper	1	Books
	2	Boxboard (chipboard)
	3	Compostable Paper
	4	High Grade Office Paper
	5	Magazines/Catalogs
	6	Mixed Recyclable Paper
	7	Newsprint
	8	Non-Recyclable R/C Paper
	9	OCC (Old Corrugated Containers)
	10	Polycoated/Aseptic/Multi-Material Containers
Glass	11	Glass Beverage Bottles - BB
	12	Glass Beverage or Food Containers - NBB
	13	Other Glass (Non-Container)
Metal	14	Aluminum Cans - BB
	15	Aluminum Foil, Pans, and Containers - NBB
	16	Ferrous Containers
	17	Other Ferrous
	18	Other Non-Ferrous
Plastic	19	#1 PET Bottles - BB
	20	#1 PET Food and Dairy Bottles and Jars -NBB
	21	#2 HDPE Bottles - BB
	22	#2 HDPE Food, Dairy & Other NBB
	23	#3-7 Bottles - BB
	24	#3-7 Bottles, Non-BB
	25	#5 PP Food Containers
	26	#6 PS Rigid Food and Beverage Containers
	27	#6 EPS Foam Food and Beverage Containers
	28	Bulky Rigids >1 Gallons
	29	Film, Agricultural and Marine Shrink Wrap
	30	Film, Garbage Bags
	31	Film, Other Bags or Non-Bags
	32	Film, Retail Bags
	33	Thermoforms
	41	Clean Wood
	42	Other Organics
	43	Pet Waste
Electronics	45	Non-CED Electronics
	46	CEDs - CRTs
	47	CEDs - Desktop Computers
	48	CEDs - Laptops and Tablets
	49	CEDs - Printers
	50	CEDs - Television and Monitors (non-CRT)
	51	CEDs - Other
	52	Computer Peripherals
	53	Products with Embedded Batteries
	54	Small Appliances
	55	White Goods
	56	Solar/PV Panels/Components
CDD	57	Asphalt Brick and Concrete (ABC)
	58	Asphalt Shingles
	59	CDD Metal
	60	Ceramic Fixtures
	61	Drywall/Gypsum Board
	62	Oriented Strand Board (OSB)/Plywood
	63	Other/Residual CDD
	64	Painted/Treated Wood
Batteries	65	Batteries - Primary
	66	Batteries – Rechargeable, Li-ion
	67	Batteries – Rechargeable, Other
UW/HHW	68	Mercury-Containing Products - Lamps
	69	Mercury-Containing Products - Thermostats
	70	Mercury-Containing Products - Other
	71	Architectural Paint
	72	Non-Architectural Paint
	73	Household Hazardous Waste
All	74	Carpet/Padding

Category		Sub-sorts
	34	Remainder/Other Plastic
Ceramics	35	Ceramic Bottles - BB
	36	Other Ceramics
Organics	37	Food Waste - Packaged
	38	Food Waste - Unpackaged
	39	Branches and Stumps >1" Diameter
	40	Mixed Yard Waste

Category		Sub-sorts
Other Wastes	75	Diapers/Sanitary Products
	76	Furniture/Bulky Items
	77	Supplements/Pharmaceuticals/Medicines
	78	Textiles/Leather
	79	Rubber/Tires
	80	Mattresses
	81	Miscellaneous Household Waste

CDD Categories and Sub-sorts

Category		Sub-Sorts
Paper	1	OCC Cardboard/Kraft Paper
	2	Other/Composite Paper
Plastic	3	Clean Film
	4	HDPE Buckets
	5	Other Plastic
Metal	6	Ferrous
	7	Non-Ferrous
Glass	8	Glass
CDD	9	Asphalt Paving
	10	Asphalt Shingles
	11	Concrete/Brick/Masonry
	12	Insulation
	13	Carpet/Padding
	14	Ceiling Tiles
	15	Ceramic Fixtures
	16	Gypsum Wall Board
	17	Pallets & Crates
	18	Oriented Strand Board (OSB)
	19	Plywood
	20	Other Engineered Wood
	21	Clean Wood
	22	Painted/Treated Wood
	23	Other CDD
Organics	24	Mixed Yard Waste
	25	Branches and Stumps >1" Diameter
	26	Other Organics
Batteries	27	Batteries - Primary
	28	Batteries – Wet-Cell
	29	Batteries – Rechargeable, Li-ion
	30	Batteries – Rechargeable, Other
UW/Haz Waste	31	Mercury-Containing Products - Lamps
	32	Mercury-Containing Products - Thermostats
	33	Mercury-Containing Products - Other
	34	Architectural Paint
	35	Non-Architectural Paint
	36	Other Hazardous Waste
Electronics	37	CED Electronics
	38	Non-CED Electronics
	39	Products with Embedded Batteries
	40	Solar/PV Panels/ Components
Special/Other	41	White Goods
	42	Mattresses
	43	Furniture/Other Bulky Items
	44	Tires
	45	Soil/Sand/Gravel
	46	Fines/Mixed Residue
	47	All Other Waste