



# Southeast Conference Municipal Solid Waste Planning: Plan Review

Draft, April 2025

## Purpose

The purpose of the plan review is to complete Task 1.1 Historical Data Collection and Review and its subtasks, as follows:

- A. Gather existing analyses of community waste profiles, virtual meetings with communities may be necessary.
- B. Identify MSW assets existing or in construction in the region.
- C. Identify current transportation options including methods used and methods available but not used (if any).
- D. Complete data gap for communities lacking analyses.
- E. Compile data sheets, by community, on current waste disposal needs by volume and cost, noting current disposal processes, challenges, and successes.
- F. Historical Study Review on best practices, and waste to energy processes within State and regional district outside of the State with comparable populations.

This background research will lay a foundation for the development of the community and regional profiles and the remainder of the project. It will serve as a useful tool to document all relevant past data and studies on MSW management in the region that Southeast Conference, Southeast Alaska Solid Waste Authority (SEASWA), and the communities can reference moving forward.

## Documents Reviewed

Name	Author/Source	Publication Date
1. Southeast Alaska Solid Waste Management Study	Finite Resources Environmental Engineering & Consulting	Nov. 1980
2. Regional Management Options for Selected Municipal Solid Waste Streams – Final Report	Ross & Associates and R.W. Beck and Associates	Sep. 1991
3. Sanitation Facilities Feasibility Study for the Community of Elfin Cove, Alaska	Alaska Dept. of Environmental Conservation Village Safe Water	Aug. 1997
4. Alaska Solid Waste Regionalization Report	Alaska Chapter of the Solid Waste Association of North America	May 1999
5. City of Hydaburg Solid Waste Management Plan	Village Safe Water	Dec. 1999

6. Final Grant Report for Grant #156-05 – Solid Waste Entity Formation	Ecology & Environment, Inc. and Cedarbrook Consulting	Oct. 2005
7. Municipal Solid Waste Disposal Alternatives – Southeast Alaska: Developing Regional Solutions	Smith Bayliss LeResch Inc.	Jul. 2006
8. Recycling in Sitka: A Look Towards the Future	Jonathan Kreiss-Tomkins	2007
9. Amended Bylaws of the Southeast Alaska Solid Waste Authority (SEASWA)	SEASWA	Jan. 2010, updated 2015
10. Results from Regional Solid Waste Baseline Survey for 21 Jurisdictions/Communities in Southeast Alaska	Unknown	Mar. 2011
11. City and Borough of Sitka Interim Solid Waste Management Plan Report – Background, Current Conditions, and System Assessment	Shaw Environmental, Inc., a CB&I Company, with WIH Resource Group	Jun. 2014
12. Solid Waste Recycling Management Plan for City & Borough of Wrangell, Alaska – Final Version	Richard Hertzberg and Chris Bell	Mar. 2015
13. Hoonah Sanitation Facilities Master Plan Update – Final Report	ANTHC, City of Hoonah	Mar. 2016
14. City of Borough of Juneau Municipal Composting Feasibility Assessment – Report on Assessment Review	Susan Thoman, Cedar Grove Systems, LLC	Jul. 2016
15. Solid Waste Collection Service Contract Between City and Borough of Sitka and Alaska Pacific Environmental Services Sitka, LLC dba Pacific Waste	Pacific Waste	Jan. 2017
16. Tribal Integrated Solid Waste Management Plan for the Community of Klawock	Kai Environmental Consulting Services, LLC	Dec. 2017
17. SEC/SEASWA Solid Waste Management Alternatives	Southeast Conference	Feb. 2021
18. Yakutat Tlingit Tribe Environmental Department’s Soil Security Stewardship (Compost) presentation & 2020 waste stream assessment data	Yakutat Tlingit Tribe	Jan. 2021
19. Southeast Solid Waste SWOT Summary	SEASWA BOD	Jan.-Feb. 2021
20. Community Composting in Sitka, Alaska: Opportunities for Phased Implementation	Zhan Okuda-Lim, Pardee RAND Graduate School	Nov. 2021
21. Wrangell Integrated Solid Waste Management Plan	Wrangell Cooperative Association Indian General Assistance Program (WCA IGAP)	Dec. 2021
22. Municipal Solid Waste to Energy for Southeast Alaska	Southeast Conference	Aug. 2022
23. 2023 Summary City of Sitka Solid Waste Transport and Disposal	Republic Services	Jan. 2024
24. City and Borough of Juneau Waste Characterization Study Final Report	Cascadia Consulting Group, Inc.	Sep. 2024
25. Juneau Solid Waste Disposal Facility and Capital Costs – Technical Memorandum	Jacobs	Mar. 2025

## Emerging Themes

- The regionalization of solid waste management in Southeast Alaska has been extensively studied since the 1980s.
- There is continued interest among the communities in working together toward more affordable and sustainable solid waste management systems.
- Starting in the early 2000s, many communities began opting to ship their MSW south due to changing and more strict landfill regulations as well as aging and closing local landfills in Southeast Alaska.
- Today there is a renewed interest in reducing, reusing, recycling and disposing of waste locally through coordinated regional efforts in Southeast Alaska due to the increasing costs and new regulations for shipping MSW south, including new rules from AML regarding the baling of wastes and closed top containers.
- Some major challenges for MSW disposal in Southeast Alaska include:
  - Closure of many local landfills in Southeast Alaska due to the lifespan of those facilities as well as stricter regulations.
  - Lack of suitable land area for new landfills in Southeast Alaska, as well as unfavorable precipitation and climatic conditions for landfill development.
  - Meeting new AML requirements for shipping MSW south including baling, compacting, and closed top containers to minimize fire risk.
  - Inability of communities to achieve economies of scale for their MSW programs which often results in financial loss.
  - Accumulation of junk vehicles and tires in Southeast Alaska communities.
  - Provision of sustainable and accessible programs for household hazardous waste collection throughout the region.
- There is continued interest in developing a regional MSW disposal facility located somewhere in Southeast Alaska, such as a new fully compliant landfill or waste-to-energy facility, where MSW from smaller communities could be sent, instead of shipping all waste south.
- Several Southeast Alaska communities have expressed interest in hosting a regional disposal facility over the years including City of Wrangell, City of Ketchikan, City and Borough of Juneau, Thorne Bay, and Petersburg.

## Individual Plan Summaries and Key Takeaways

### 1. Southeast Alaska Solid Waste Management Study (November 1980)

The purpose of this study was to assess the current state of existing solid waste management systems in Southeast Alaska and develop a technical analysis of alternative systems practical for the study area. The study aimed to determine the relative feasibility of three basic solid waste management systems for Southeast Alaska:

1. A regional solid waste management system serving the entire Southeast Alaska Panhandle utilizing barges or the Marine Highway and a large central solid waste processing or disposal facility.
2. Several subregional solid waste management systems serving logical waste sheds as determined by the geographic and transportation characteristics.
3. Local solid waste management systems where each municipality or borough operates their own solid waste management facility.

During initial implementation of a survey and interviews with local officials, the status of existing waste management systems for municipal solid waste, junk cars, and wood waste were the focus. The survey also attempted to determine opportunities for solid waste energy recovery systems.

## Key Takeaways

- This study used municipal solid waste data from the private waste contractor in Juneau, Channel Sanitation, to estimate waste volumes based on population for the other Southeast Alaska communities.
- Wood waste can be processed by municipal solid waste incinerators, but not the other way around. At the time of the study, most wood producers were not interested in collaboration with municipal waste management systems, since they used wood waste for on-site energy production.
- The study states that “landfill disposal of junk autos consumes large quantities of valuable landfill space and should not be practiced if there are any possible alternatives. Stockpiling of auto hulks until a sufficient number have been accumulated is a much better alternative if the storage space is available.” (pg. 41)
- The study states that “large volume material recycling for residential solid waste is not considered a viable solid waste management option for Southeast Alaska and is therefore not considered in this study. The primary reasons are distances to southern markets and the technical and social problems affecting either mechanical or voluntary separation respectively.” (pg. 43)
- Leachate from landfills in Southeast Alaska is a major concern due to the high level of precipitation and limited soil. Leachate control systems must be constructed prior to a landfill becoming active and can be expensive.
- Baling and bale-fill operations are considered viable options for Southeast Alaska communities. They can reduce the volume of waste going into a landfill and the amount of cover material required but still produce leachate that needs to be treated. Bale-fill operations are typically simpler and cheaper than conventional sanitary landfills. Baling should not be considered in communities where waste production is less than 1-2 tons per day because each bale weighs approximately two tons.
- Solid waste shredding units for landfilling are not considered a viable option for Southeast Alaska because of the risk of explosions, high repair and maintenance costs, leachate generation potential, and the need and associated costs to also operate a sanitary landfill.
- Modular incineration is considered a viable option for Southeast Alaska communities. EPA studies show that residential modular incinerators achieve 94% volume reduction and 55% weight reduction of waste (pg. 52). Costs of these systems is on-par with baling and shredding. Energy recovery can be achieved with larger units when there is sufficient solid waste, and a customer who is interested in purchasing the energy.
- A single regional solid waste management system with a central facility is not feasible and would be very energy intensive. A sub-regional system has many of the same issues with transportation feasibility, cost, and scale as the regional system. The report looks most positively as mostly individual city/borough systems with coordination in key areas that make sense. Small batch incinerators are recommended for smaller communities and baling and/or energy recovery systems are recommended for Juneau, Sitka, and Ketchikan.

## 2. Regional Management Options for Selected Municipal Solid Waste Streams – Final Report (September 1991)

The purpose of the project was to investigate the feasibility of Southeast Alaska entering the world recycling market and improve management of used oil and household hazardous waste. The report documents the process of the Southeast Conference's Solid Waste Management Committee characterizing the current waste management situation in Southeast Alaska; outlining the factors influencing positive changes; and developing recommendations for improved waste management. The Committee, 14 communities, the Alaska Marine Highway System (AMHS), and the Alaska Department of Environmental Conservation (ADEC), were involved in this project.

### Key Takeaways

- Southeast Alaska's ability to recycle solid waste such as cardboard, vehicle batteries, and scrap metal is heavily influenced by the cost of material transport from dockside in the communities to buyers and by the price the materials can command in the world market. (pg. i)
  - Based on historic prices, recycling aluminum, office paper, and auto batteries generally has a net economic gain.
  - Auto bodies, cardboard, and scrap metal fluctuate between a gain and a loss.
  - White goods (appliances, etc.) and tires constitute an economic loss.
- There are opportunities for recycling certain waste streams in Southeast Alaska but some such as aluminum and office paper will require communities to develop their own program while others such as scrap metal may benefit from joint efforts.
- The report identified three specific alternatives for improved household hazardous waste management in Southeast Alaska, but all involve a greater cost than what is currently being spent. The Committee believes this issue warrants the pursuit of additional funding through coordination with ADEC and the Alaska State Legislature. The three alternatives investigated each have pros and cons, and are as follows:
  - Expanded clean-up days to provide more regular service and serve more communities.
  - Depots plus collection days, creating permanent year-round collection centers in larger communities and periodic clean-up events for the smaller communities.
  - A mobile collection system that could routinely travel throughout the region collecting waste from communities.
- Used oil generators in Southeast Alaska include vehicle and boat owners, power companies, pulp mills, and AMHS. Management options currently in use include burning used oil on site as fuel and shipment to Seattle for recycling or disposal.
- Opportunities exist for a more systematic regional approach to used oil management. An Agreement in Principle was signed between ADEC, AMHS, and several private entities acknowledging the potential for a regional used oil management system, and conversations should continue to support this goal.

## 3. Sanitation Facilities Feasibility Study for the Community of Elfin Cove, Alaska (August 1997)

This study is the result of a State of Alaska Village Safe Water (VSW) Capital Improvement Project (CIP) awarded to Elfin Cove to evaluate the feasibility of providing improved water delivery and wastewater disposal systems. The study also includes solid waste facility and management alternatives.

## Key Takeaways

- At the time of the study, solid waste management was largely practiced on an individual basis except for a limited recycling program organized by volunteers.
- Most combustible refuse was burned at a community-designated tideland burn site with ash removal left to tidal action, which is on average 10 feet.
- Solid waste alternatives developed in the study use incineration and recycling to reduce volume and generate revenue to offset operations and maintenance costs.
- A landfill for ash is infeasible due to lack of suitable land disposal area.
- A low-tech incinerator, crushing machines for glass and aluminum cans, and building space for recyclable materials sorting and storage for shipment are recommended.
- If all residents incinerate their own trash and separate recyclable materials, then minimum paid operator and administrative oversight will be required.
- Consolidating shipments with Pelican for disposal in Washington State is the alternative with lowest annual O&M costs.
- The study offers several alternatives for siting an incinerator and recycling facility and provides operations and maintenance and capital cost estimates.

## 4. Alaska Solid Waste Regionalization Report (May 1999)

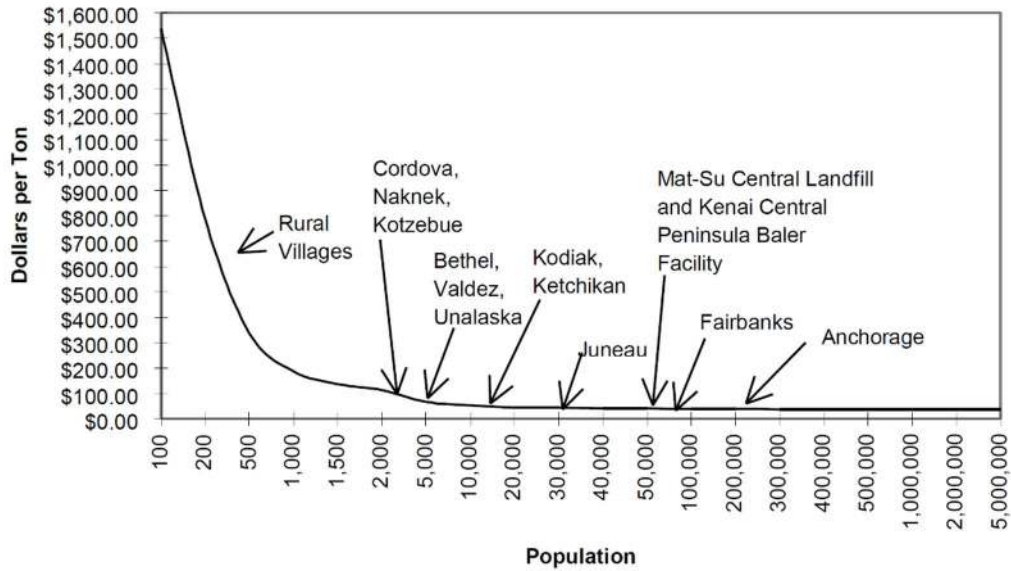
This report analyzes the potential for regionalization of solid waste management across the state. It provides several case studies in areas where regionalization has already been accomplished by communities and also provides regional districts for non-regionalized areas of the state. It provides a framework for developing regional authorities in unorganized areas of the state. The report also includes discussion of transportation options and estimates landfill operational costs specific to Alaska.

### Key Takeaways

- After completing two studies, one on the existing solid waste system and one on regional recycling potential, in 1994 the Southeast Conference organized a on-time scrap metal collection program where communities paid a proportional share of the costs of barging metal to a recycling company in Washington state.
- Southeast Conference also organized a household hazardous waste collection program utilizing a mobile collection unit with \$200,000 from the State of Alaska. The van is stationed in Juneau and travels by AMHS ferry to communities as needed. AMHS provides a 50% discount for hauling the unit. Communities pay a proportional fee for hauling hazardous waste out of state to a recycling or disposal facility. The cost of using the regional hazardous waste collection van is estimated to be about half of what it would take for communities to operate their independent programs.
- Tenakee Springs is unique in that they do not have a landfill, and households manage their own waste. All waste is either burned by residents or containerized and shipped to a town with a landfill. Most waste is transported out of town on the ferry, but some individuals haul their own with small watercraft.
- Ketchikan Gateway Borough decided to ship all waste out of the community after comparing that cost with upgrading and expanding the existing landfill. Full costs of the landfill including closure, post-closure, monitoring, and long-term leachate treatment costs were higher than shipping waste to a fully compliant landfill.

- Ketchikan Gateway Borough has solid waste management powers and serves as the regional authority. Some logging camps and smaller communities like Saxman haul waste to Ketchikan for processing. Municipal waste is baled before shipment.
- Cruise ships discharge waste at the Port of Ketchikan in the summer. Waste from foreign vessels is incinerated in accordance with the U.S. Department of Agriculture Plant Health Inspection Service (APHIS) before shipment to Roosevelt Regional landfill in Washington State. The borough has requested a waiver that may be granted by APHIS if potential for disease spread from unincinerated waste is low. (pg. 2-21)
- All case studies considered in the report show that the regionalization of waste management results in improved control and management of waste. Most cases also saw reduced costs.
- Most regional programs include:
  - An administrative body with control authority over waste management in the region
  - A planning process to determine the most appropriate management options
  - A funding mechanism to pay for capital and operating costs of the system (pg. 2-31)
- The Prince of Wales Island Solid Waste Study found that the most effective MSW management plan for the communities of the island includes a balance of several efforts:
  - Reduce the amount of MSW generated (least costly)
  - Implement an aggressive island-wide recycling program
  - Communities accept a complete island-wide MSW management facility such as a lined landfill or a composting facility at the existing Klawock site (ultimate solution). (pg. 3-14)
- “Section 4006(a) of the Resource Conservation and Recovery Act (RCRA) requires states to define solid waste management regions for purposes of encouraging and facilitating the development of regional planning for solid waste management... For unknown reasons, the state of Alaska never defined solid waste management regions in Alaska.” (pg. 4-1)
- “Title 40 Code of Federal Regulations (CFR) 255.30(a) requires that in the event that no local or regional agency is held responsible for disposal for a region, a State agency should be identified and held accountable for the operation of the solid waste system. For unknown reasons, the state of Alaska has not designated a solid waste management utility to manage waste in the unorganized borough.” (pg. 4-1)
- “Under the Land Disposal Program Flexibility Act of 1996, the governor of the State of Alaska has the authority to exempt landfills in native villages that dispose of less than 20 tons of municipal waste daily from any and all solid waste regulations and laws.” (pg. 5-6)
- “Air cargo shipment of solid waste, however, is possible and in many cases more economical than attempting to construct and manage a sanitary landfill in many small communities. This situation is particularly true in communities that lack suitable land for a waste disposal.” (pg. 6-2)
  - Processing waste through incineration, baling, and/or containerization beforehand can make air cargo shipment more feasible.

**Figure 5-2. Disposal Costs vs Population Size.**



<b>Population Range</b>	<b>Disposal Cost Range (\$/ton)</b>
100,000 to 500,000	39 to 38
10,000 to 100,000	53 to 39
5,000 to 10,000	68 to 53
2,000 to 5,000	112 to 68
1,000 to 2,000	187 to 112
500 to 1,000	340 to 187
100 to 500	1,500 to 340

## 5. City of Hydaburg Solid Waste Management Plan (December 1999)

This plan documented existing solid waste management issues in Hydaburg and provided recommendations for improvements along with cost estimates for the improvements.

### Key Takeaways

- At the time of the plan, Hydaburg had an unregulated dump that was causing health and safety issues for the community. The State of Alaska Village Safe Water Program authorized the City to develop a solid waste master plan to address these issues.
- Overall waste volumes as estimated by a survey include (comparable to quantities determined in the 1991 Prince of Wales SWM Study):
  - 39 cubic yards of loose garbage collected = 2,028 cubic yards per year
  - 220 tires discarded each year
  - 4 automobiles per year

- 8 appliances (refrigerators, stoves) per year
- 2 drums of oil per year
- Issues identified in the plan included:
  - Insecure storage of solid waste at residences resulting in animals (bears, ravens) getting into the waste and spreading it throughout the community.
  - No controls over disposal at the unregulated dump, resulting in anyone being able to dispose of any material at the site including potentially dangerous and hazardous materials.
  - No existing options for household hazardous waste disposal.
  - Garbage being incompletely burned and not buried at the dump due to insufficient equipment was resulting in additional issues with wildlife scattering waste around the area.
  - Potential of contamination to the City's water source due to wildlife scattering waste.
  - Potential contamination of a subsistence fishing and shellfish area due to leachate from the dump.
  - The existing twice per week garbage collection is expensive and lack of suitable containers at residences results in inefficient collection causing the community to lose over \$10k per year on solid waste operations.
- Recommendations include:
  - Close the current dump and locate new permitted Class III 10-acre landfill directly north of the current site that will provide space for the next 40 years.
  - Establish a collection point in town near the City Garage for recyclables, hazardous waste, excess household solid waste, and scrapped vehicle and appliance salvage. Include a building on site for manager office and hazardous waste storage.
  - Provide 90-gallon closed wheeled containers for household garbage service and reduce collection from twice to once per week.
  - Purchase a new compacting garbage truck with appropriate lift capability for the 90-gallon containers.
  - Purchase a used 2-yard front-end loader and used D4 or similar size bulldozer for handling solid waste at the landfill.
  - Increase household City utility rates and establish a commercial rate for businesses that produce substantial amounts of waste.
  - Work with Haida Corporation on land acquisition for the new landfill.

**Waste projections for Hydaburg produced at the time of the plan.**

<b>Table 1</b>				
<b>Projected Volume of MSW Generated</b>				
Year	Population	Total Uncompacted Annual Landfill Volume (cu. Yd.)	Compacted Volume (cu. Yd.)	Volume After Burning
1998	369	2,600	1,560	1,248
2003	387	2,705	1,623	1298
2008	408	2,844	1,706	1,365
2018	450	3,141	1,885	1,508
2038	550	3,833	2,300	1,840

*(assumes 40% reduction in volume by compacting,  
20% additional reduction by burning)*

## 6. Final Grant Report for Grant #156-05 – Solid Waste Entity Formation (October 2005)

This report outlines the activities undertaken and includes the deliverables produced through a grant provided to Southeast Conference by the Denali Commission. The work of the grant included researching the structure of solid waste entities in the Lower 48, reviewing Alaska statute, and developing templates for a solid waste entity. The grant was also used to develop draft legislation through a state representative to create and authorize Solid Waste Management Authorities in Alaska.

### Key Takeaways

- The contractor brought on for the project, Ecology and Environment, Inc., researched solid waste management structures in the Lower 48 and recommended either creating an authority through a joint government agreement or through statute.
- A legal team reviewed the consultant's findings and concluded that establishing a solid waste authority through statute would be the best option because similar entities can already be created in Alaska per statute (e.g., Port Authorities and Regional Resource Development Authorities) and because an authority created through statute would include appropriate limits of liability for the member governments involved. They noted that legislation would be necessary to allow for a new type of authority in Alaska to manage regional solid waste.

## 7. Municipal Solid Waste Disposal Alternatives – Southeast Alaska: Developing Regional Solutions (July 2006)

This report evaluated the feasibility of a regional solid waste management in Southeast Alaska aimed at serving especially those communities currently shipping their waste to the Lower 48. SEC and consultants on this project reviewed existing practices, estimated the region's future needs, considered possible locations for a future regional disposal site and technologies for recycling and waste reduction.

### Key Takeaways

- The report concluded that there is enough interest among communities, state and federal agencies, private firms, and the public to continue exploration of a regional solid waste facility.
- In 2006, enabling legislation for solid waste authorities in Alaska was passed.
- Wrangell, Thorne Bay, and Petersburg all expressed interest in hosting a regional site, while private companies in Kake and Haines expressed interest in working on the issue with technologies they are developing. Metlakatla and Sitka also expressed political support and interest in participating. Juneau officials are observing the development of a regional solution and may be interested in participating.
- Thorne Bay is conducting a feasibility study of a potential site in Tolstoi Bay on Prince of Wales Island (in 2006).
- The regional solid waste options include:
  - Continue closure of landfills and ship waste to L48
  - Develop local landfills
  - Develop one or more regional state-of-the-art landfills (focused on in this report)
- All major communities from Sitka southward ship MSW to Washington State or Oregon. These include Ketchikan, Sitka, Petersburg, Wrangell, Craig and Klawock.
- Minimum site requirements for a regional landfill are approximately 20-50 acres of land plus buffers and cost to develop a regional site without land acquisition is \$10-\$30 million.

- With sufficient funding, community momentum, and state and federal agency involvement it is estimated that a regional landfill could be built in 2-3 years.
- It is assumed a landfill operations company would be hired to operate the site.
- There is no Material Recovery Facility (MRF) in Alaska.
- Options for Southeast Alaska RSWA as identified in the report:
  - **Shipping south;** ship under the umbrella of the RSWA. Does not appear to offer significant cost reductions but may be a mechanism for better disposal rates. Bringing material to a MRF and then shipping it out doesn't appear to be cost effective.
  - **Conventional landfill or balefill;** landfill is a viable option depending on the site. All locations in Southeast Alaska will require landfilling residuals. Landfill needs an impermeable liner and leachate collection system. A methane gas collection system will also likely be required. The methane could be used to produce electricity. The landfill option can be construction in <2 years as a temporary measure prior to a Waste to Energy facility being developed.
  - **Waste to energy by incineration;** Location dependent upon energy demand and proximity to the electrical grid. 15-25% of incinerated waste requires landfilling. With aggressive MRF component, could reach the lower number. A 100-ton-per-day plant can produce 2.5 megawatts of energy equal to the electricity needs of 2,000 homes. Can also feed steam for a kiln or hot water for a facility.
  - **Waste to energy via ethanol conversion;** Proposal to build one in Ketchikan (at the time of the report). None existed in the U.S. at the time, and some research indicated these plants require more fossil fuel than the energy produced.
  - **Composting;** About 75% of MSW is compostable and MSW has been composted for over 75 years. There are about 100 facilities in the US and one in Haines (Haines Sanitation). Southeast Alaska compost would be hard to market, but could serve as cover material for landfilling.
- A list of potential funding sources is included in the report, including U.S. EPA, USDA Rural Development, Army Corps of Engineers, U.S. EDA, Federal Interagency, ADEC, Denali Commission, and Biomass/Bioenergy Research and Development Funding Assistance.
- Construction costs (July 2005) for a regional landfill according to MSW Management Magazine run from \$300,000-\$774,000 per acre

**Summary of community costs derived from a survey at the time of the study.**

<b>COMMUNITY COSTS</b>					
<b>Community</b>	<b>Collection Costs</b>	<b>Recycling Costs</b>	<b>Total Disposal Costs</b>	<b>Hazardous Waste Disposal</b>	<b>Shipping Cost</b>
Juneau	Private	162,000	Private	291,000	
Elifn Cove			1,000		
Pelican			5,000		
Thorne Bay			14,162	3,000	
Wrangell	96,189/ Landfill	2,000	299,370	15,400	203,181
Craig		1,000	181,273	1,873.35	178,400
Petersburg	56,250		773,904		205,000
Sitka	550,000	490,000	2,764,405		1,223,175
Ketchikan	662,620	111,177	2,850,488	55,500	672,193
Gustavus	58,680	6,000	64,680		21,000
Haines	Private	6,700			
Yakutat	\$60,000 landfill		60,000		

**Estimated landfill construction costs based on the authors' research, which included reviewing landfill construction costs in other Alaskan communities.**

<b>Typical Construction Costs</b>		
	<b>Low Cost</b>	<b>High Cost</b>
Clear/Survey	\$ 6,000	\$ 11,000
Excavation	\$ 100,000	\$ 330,000
Berm	\$ 10,000	\$ 16,000
Clay Liner	\$ 32,000	\$ 162,000
Geomembrane	\$ 24,000	\$ 35,000
Geocomposite	\$ 33,000	\$ 44,000
Granular Soil	\$ 48,000	\$ 64,000
Leachate System	\$ 8,000	\$ 12,000
QA/QC	\$ 75,000	\$ 100,000
	<b>\$ 336,000</b>	<b>\$ 774,000</b>

PER ACRE  
Source: MSW Management, July/Aug 2005

**Southeast Alaska Estimated Costs – SBL - 2005**

Site Development (250,000/acre) .....	\$ 2,500,000
Sewer Plant.....	\$ 1,000,000
Materials Recovery Facility.....	\$ 1,000,000
Permits and Engineering .....	\$ 500,000
Equipment.....	\$ 500,000
Utility Development .....	\$ 2,000,000
Buildings .....	\$ 1,500,000
Reserve .....	\$ 1,000,000
 Waste-To-Energy Plant .....	 \$15,000,000

\*Minimum landfill footprint is approximately 50 acres. Minimum site development needed is approximately 10 acres. Waste-to-Energy plant construction calculated at per-ton daily input of \$250,000/ton.

## 8. Recycling in Sitka: A Look Towards the Future (2007)

This analysis of recycling program options was prepared by Jonathan Kreiss-Tomkins in 2007. Three scenarios were examined: No action, status quo; Expand the current recycling program; Switch to curbside single-stream recycling program. The analysis recommends the third scenario, curbside single-stream recycling, because it is most environmentally friendly, most convenient, and most financially beneficial to Sitka and its residents.

### Key Takeaways

- Sitka's diversion rate plateaued at 7%, likely due to the inconvenience of the current program requiring residents to sort recyclables and bring them to a central location.
- The city's baling facility was undersized for an additional influx of recyclables.
- 30% of refuse is picked up by the contractor while 30% is delivered to the transfer station by citizens, businesses, and institutions.
- The largest capital expense to implementing a curbside recycling program would be the recycling containers.
- Access to a regional MRF would lower the cost of recycling by reducing shipping distance and cost.

## 9. Amended Bylaws of the Southeast Alaska Solid Waste Authority (Jan. 2010, updated 2015)

This document serves as the bylaws for the Southeast Alaska Solid Waste Authority (SEASWA), adopted January 27, 2010. It outlines the purpose of SEASWA, its board of directors and membership, office location, meetings, committees, financial and records policies, and procedures for updating the bylaws and other regulations.

### Key Takeaways

- SEASWA was established under Alaska Statute as a regional solid waste authority.
- To join, each member government had to pass an ordinance and also hold a referendum election asking the public whether or not to join the authority.
- "The purpose of the Southeast Alaska Solid Waste Authority (SEASWA) is to provide environmentally sound and cost-effective management of solid waste, including storage, collection, transportation, separation, processing, recycling, and disposal, to protect the public health, safety, and welfare; improve the environment of the State of Alaska, recover resources and energy, and prevent pollution." (pg. 1)

## 10. Results from Regional Solid Waste Baseline Survey for 21 Jurisdictions/Communities in Southeast Alaska (March 2011)

This survey collected MSW data from 21 communities in Southeast Alaska. Data points included contact person, population, disposal method, location, operator, and contract expiration, tons of waste disposed annually, disposal cost per ton, available disposal capacity, barge docking/loading capability, land available for facility consolidation, transfer sites, landfill, and/or incinerator, and recycling program details.

### Key Takeaways

- City of Ketchikan indicated that their infrastructure is already in place and they could handle additional waste volumes.
- City and Borough of Wrangell indicated that the community and government currently seems supportive of hosting a regional facility.

## 11. City and Borough of Sitka Interim Solid Waste Management Plan Report – Background, Current Conditions, and System Assessment (June 2014)

The purpose of this interim report is to provide background information on waste quantities, current handling methods, and costs for use in subsequent identification and evaluation of solid waste management strategies. It represents Phase 1 of the solid waste management planning process for the City and Borough of Sitka (CBS).

### Key Takeaways

- Drivers for developing the analysis included waste contracts expiring, community interest in recycling and composting, the need to address bear concerns, and interest in developing a new rate model to maintain current services and evaluate expanded programs.
- Detailed purposes of the SWM plan are as follows:
  - Determine goals/objectives for solid waste management in Sitka including guiding principles, priorities, and direction
  - Determine the core needs that should be addressed
  - Describe and assess existing services, facilities, and infrastructure, program administration and monitoring procedures
  - Develop program, policy, and service recommendations
  - Propose modifications, upgrades, or replacements for facilities and infrastructure based on the above recommendations
  - Estimate costs for budgeting and setting an adequate rate structure to support existing and new programs/services (capital improvements and maintenance)
- Objectives to consider from Public Works memo:
  - Comingled single-stream approach to recyclables collection from residential/commercial/institutional sectors
  - Composting organics
  - Materials exchange and reuse area
  - Banning disposal of certain materials
  - Promotion/education strategy to support waste diversion
  - Participation in a regional approach to household hazardous waste
  - Technical and policy responses to deal with bear issues
- Solid Waste Advisory Committee (SWAC) consensus in March 2014:
  - Continue to use off-island disposal
  - Investigate curbside recycling as a short-term priority
  - Continue to allow residents to drop off 200 pounds of waste monthly at the transfer site free of charge
  - Investigate cost neutral or cost reducing diversion or self-sustaining opportunities for organics
- A community survey was conducted with the following findings:
  - High level of satisfaction with existing MSW services
  - Community interest in curbside recycling and composting, with more interest in recycling, and with sensitivity to costs for both
  - High-level of awareness about current programs
  - Mixed interest in addressing bear issues and a sensitivity to costs to do so

- Along with shipping MSW out, CBS also disposes of small amounts of demolition waste at the Sitka landfill, such as boats that are demolished, as well as non-municipal waste materials such as asbestos and contaminated soil (pg. 20)
- Biosolids from the wastewater treatment plant are also disposed of in a designated area of the Sitka landfill.
- Sitka has two recycling programs: Sitka Recycle Center, where residents and businesses can drop off materials, and a bulk metal program for junk vehicles and other large scrap metal materials.
- The recycling center collects newspaper, corrugated cardboard, mixed paper, glass, tin cans, and PET and HDPE plastic containers which are all shipped off-island for processing and marketing, except for glass which is crushed and repurposed at the Sitka landfill.
- Sitka saw a 6.7% diversion rate in 2013. The rate ranged from 5.3% to 7.5% from 2004-2013. This does not include aluminum cans, bulky scrap metals, or junk vehicles.
- The report used waste composition data from Skagway, Alaska and the U.S. EPA to estimate waste stream composition for Sitka.
- Per CBS municipal code, all residents and businesses served by an electric meter (except for vacant buildings) are required to use and pay for MSW collection services provided by CBS.
- Alaska Pacific picks up all waste from residential, commercial, institutional, municipal, and public litter containers and takes it to the Sitka Transfer Station.
- Waste transfer, transport, and disposal is through one contract with Republic Services and CBS. Republic operates the transfer station through a separate contract with Alaska Pacific.
- “Transfer and transport of the waste containers is completed under a contract between Republic Services and Alaska Marine Lines (AML). Transfer of the 48-foot open top intermodal containers between the Sitka Transfer Station and the harbor is completed by Arrowhead Transfer under a contract with AML. The waste containers are transported via AML barge from Sitka to Seattle. Containers are then transferred to a Burlington Northern Santa Fe Railroad (BNSF) intermodal yard. Transport of the containers from Seattle to the Roosevelt Regional Landfill in Klickitat County, Washington is completed by BNSF under a contract with Republic Services. Republic hauls the containers to the actual landfill site.” (pg. 29)
- Recycling responsibilities are split between Republic Services and CBS. CBS staff haul metal and plastics to the scrap yard and bale or cube them. Staff haul glass to the landfill where it is crushed and repurposed. Alaska Pacific, under contract to Republic, hauls paper to the scrap yard for baling. After baling, shipped out recyclables follow the same path as MSW. Once they reach Seattle, they are trucked to Republic’s materials recovery facility.
- The Sitka landfill was permitted in 2006 as a Class III landfill that can accept inert waste materials and less than 5 tons of MSW per day on an annualized basis. (pg. 32)
- A disadvantage/weakness of Sitka’s MSW and recycling operations is that they are geographically dispersed at opposite ends of the downtown core.
- A key challenge for Sitka is how to simplify, consolidate, and centralize operations and services for both disposal and recycling. (pg. 38)
- The development of a local disposal facility is challenged by space constraints and the fixed costs of such a facility could serve as an economic deterrent to increasing recycling. (pg. 41)

	2015	2020	2025	2030	2035	2040
Population	9,084	9,046	8,944	8,792	8,602	8,388
Disposal Tons	8,389	8,354	8,260	8,119	7,944	7,746
Recycling Tons	596	594	587	577	564	550
Generated Tons	8,985	8,948	8,847	8,696	8,508	8,296

Notes:  
 1. Tonnage projections based on disposal rate of 0.92 tons/person/year and recycling rate of 0.07 tons/person/year observed for 2013.

Recycled Material	Tons					% of Total
	2010	2011	2012	2013	Average	
Newspaper	10.20	6.12	9.18	6.12	7.91	1.4%
Mixed Paper	178.96	233.76	198.74	231.92	210.85	36.4%
Cardboard	299.85	275.23	268.81	266.18	277.52	48.0%
Plastic PET	8.20	8.40	7.40	15.00	9.75	1.7%
Plastic HDPE	2.80	4.20	3.60	10.00	5.15	0.9%
Tin Cans	16.40	6.80	9.10	11.60	10.98	1.9%
Glass	17.20	35.46	117.31	55.59	56.39	9.7%
Total	533.61	569.97	614.14	596.41	578.53	100.0%

Source:  
 1. CBS records, Rabanco invoices.  
 Note:  
 1. Aluminum cans were 13 tons in 2011, 11 tons in 2012 and 12 tons in 2013.

## 12. Solid Waste Recycling Management Plan for City & Borough of Wrangell, Alaska – Final Version (March 2015)

The purpose of this plan is to develop a recycling strategy by evaluating how to best collect and process recycled goods and consider necessary equipment. The plan focuses on how to recover materials from MSW.

### Key Takeaways

- Wrangell already has a scrap metal recycling program.
- Options recommended in the 2009 Solid Waste Management Plan developed by the Department of the Navy focused on incineration and were deemed infeasible due to high cost.
- Wrangell has a universal refuse collection service.
- There is no active landfill in Wrangell for MSW. Outside of the Materials Recovery and Handling Facility (MRHF) there is an area for burning paper, yard waste, and wood.
- Disposed waste is put into containers at the MRHF for transport by barge and rail to Republic Services Roosevelt Regional Landfill in WA.
- The per capita disposal rate for Wrangell is a little over half a ton per year or 3 lbs./person/day.
- Wrangell has two fully automated side-loading garbage trucks for trash collection purchased in 2009 and expected to last until 2024.

- Wrangell was a founding member of SEASWA.
- Wrangell has a contract for MSW landfilling and recycling with Republic Services.
- First priority Conclusions/Recommendations:
  - Comingling of all recyclables including glass is preferred.
  - Designate a Program Coordinator and representative support group.
  - Purchase a baler.
  - Identify an area of the MRHF for recyclables.
  - As a preliminary step, set up a recyclables drop off area at the MRHF.
  - Establish “Recycling Day” events once or twice per month at a downtown location.
  - Establish a promotion, education, and information program about recycling.

### 13. Hoonah Sanitation Facilities Master Plan Update – Final Report (March 2016)

This plan focuses primarily on water and wastewater systems but includes a tiny section on the landfill and municipal solid waste.

#### Key Takeaways

- Hoonah operates a Class III landfill under Solid Waste Permit #SW3A059-17.
- White goods, metals, computers and batteries are separated at the landfill.
- Cars are backhauled annually.
- Residents dump trash directly into a burn box.
- Landfill appeared in good condition at the March 2015 visit.
- No additional MSW facilities were recommended at the time of the report.

### 14. City of Borough of Juneau Municipal Composting Feasibility Assessment – Report on Assessment Review (July 2016)

This report provides an assessment and feasibility considerations for developing a composting program in Juneau. An assessment tool was developed by Cedar Grove Advisory Team and sent to CBJ staff. Cedar Grove received the information the staff shared and used that to develop their assessment. The assessment report addresses the primary drivers related to program feasibility and provides recommendations on limitations and advantages that CBJ has in implementing a composting program.

#### Key Takeaways

- CBJ community and governance is favorable for participation in composting.
- CJB is limited by its population size, low density development pattern, and climate limitations for feed stock production, but high landfill rates balance out these limitations.
- Available feedstocks in CBJ are limited compared to other urban areas in the L48; yard waste collection/drop off programs and outreach/coordination with institutional entities will be necessary to ensure adequate material for composting.
- Additional carbon sources for the required 30:1 carbon : nitrogen feedstock ratio for composting will need to be identified, for example, through including more cellulosic materials such as food-impacted pizza boxes, compostable coffee cups, non-recyclable waxed cardboard grocery produce boxes, and food soiled paper.

- Financing and budgeting will be required to establish a pilot and/or permanent program; a 1% tax increase of public bonds could be explored
- Ideally, a facility could be situated on CBJ-owned land and collocated with the gravel pit. If CBJ land is not an option, long-term lease options for a 3–5-acre site could be explored.
- If pre- and post-consumer food wastes are included, additional environmental controls, technologies, and additional land are required. If only wood, grass, and landscape materials are collected, less land, and less leachate collection/technology would be required.
- The assessment recommends first establishing a small-scale demo site and then if deemed feasible, a permanent site
- A pilot program cost is estimated at \$12,460 annually, which includes a compost tipping fee of \$100

## 15. Solid Waste Collection Service Contract Between City and Borough of Sitka and Alaska Pacific Environmental Services Sitka, LLC dba Pacific Waste (January 2017)

This is the contract between the City and Borough of Sitka and Pacific Waste, signed in January 2017 and lasting for 15 years with the option for a four-month extension beyond that term.

### Key Takeaways

- Pacific Waste’s responsibilities include curbside residential and commercial refuse collection and transport to the transfer station using vehicles it supplies as well as providing the necessary labor and equipment to operate the Transfer Station, including baling and loading source separated recyclables.
- CBS pays the cost of transporting recyclables to market and retains ownership of the materials.

## 16. Tribal Integrated Solid Waste Management Plan for the Community of Klawock (December 2017)

This plan was developed as a living document as emergent needs were fluctuating at the time of its development. The plan also involved solid waste characterization. The Klawock Community Association developed the plan to identify unmet solid waste management needs for the community. It is meant to supplement the existing City of Klawock solid waste management plan developed in February 2005. This plan will set community priorities, establish set practices, and seek additional funding for solid waste and recycling projects.

### Key Takeaways

- The City of Klawock, not the Klawock Cooperative Association, has the authority of solid waste management.
- The community of Klawock has the island’s only airstrip.
- City of Klawock operates an ADEC-permitted Class III landfill. City of Klawock and City of Craig have waste collection services that dispose of waste at the Klawock landfill. The landfill primarily serves as a transfer station for loading waste to be shipped south. Only glass, construction waste, and treated sewage sludge are landfilled on site. The landfill is about 11 acres in area and fenced.
- Klawock landfill is only one of two on the island, so it accepts wastes from other communities.
- Other sources of local waste include wood waste from timber harvest and wood processing, fish waste from sport and commercial fishing, and construction waste from road and development projects. Wood waste is disposed of at alternate locations, fish waste from residents directly into the ocean and

processing plant waste require separate permits for water and compost disposal. Construction waste ends up at the landfill.

- A survey of Klawock residents showed an interest in increased recycling options and residents raised concerns about a wood waste site creating runoff that could be impacting the Klawock Lake subsistence fishery.
- Residents from other communities on the island can self-haul to the Klawock landfill. In 2017, the landfill began accepting wastes from Coffman Cove and temporarily accepted waste from Thorne Bay for transshipment (at the time of the plan development).
- Residents' vehicles are weighed upon entrance and exit to the landfill facility and charged accordingly for their trash.
- At the time of the plan, transshipment rules changed to require baling and City of Klawock was exploring their options for retrofitting the existing building and acquiring a baler.
- There is a contingency disposal cell not in use but available in case that transshipment cannot occur. Wood waste is used as cover, which is flammable. Mobile fire fighting equipment is required on site, but Klawock landfill does not have any. ADEC must be alerted if the contingency cell is used.
- Keeping compaction equipment operable, such as dozers, is a challenge at the landfill site.
- A temporary junk car removal program was implemented in 2015-2016. There is a need for an annual program and to keep site operators trained up on removing hazardous materials from the vehicles.
- The waste characterization study involved 30 households from Klawock and 50 from Craig.
- The four Tribes on Prince of Wales Island have been working together to develop a recycling program
- Aluminum cans have been backhauled since the mid-2000s and are collected in a container at the Klawock grocery store and in Craig. Supports the PTSA through the National Cans for Kids program.
- Hazardous waste disposal efforts at the time of the plan needed additional support and expansion to remove these wastes from the waste stream.
- Needs at the Klawock landfill/on Prince of Wales Island:
  - Heavy equipment
  - Recycling building
  - Second baler for recyclables
  - Yearly junk car removal program
  - Hazardous waste program and building
  - Metal compactor
  - Car stand for draining vehicle fluids
  - HAZMAT/HAZWOPPER training funds/support
  - Wood waste disposal/reuse options (and planning effort)
  - Exploration of at-home composting or a larger operation to address food waste
- The study includes cost estimates for recommended programs/needs.

**Table 1. Klawock Landfill Site Features and Situation, Klawock, Alaska.**

Feature	Current Description
Land Ownership	The land is owned by the City of Klawock, but is located within the City of Craig municipal boundaries.
Location and nearest residence	The landfill is located at 55.49978°N and 133.12929°W. The closest residential area is located 3,756 feet south of the landfill.
Operation Responsibility	The City of Klawock is responsible for landfill operations; waste collection is overseen by the City of Klawock and City of Craig.
Path/area inside the Landfill for unloading wastes	The landfill is fenced and leveled. During normal hours of operation vehicles can drive in and unload waste into a covered transfer building.
Site Size	The landfill is approximately 11 acres.
Site Shape	The landfill is shown in Figure 2. About 30% of the landfill area is covered by piled scrap metal waiting for back haul. The transfer station building is approximately 4,200 square feet and located in the southeastern corner of the site. The remainder of the site is open ground where cover material is placed over disposal operations for waste and sewage sludge.
Type of site management	Municipal and residential waste is unloaded into the transfer station building and then pushed into containers for transport. There is additional staging for scrap metal and vehicles.
Operator/ Technician Staff	There are 2 landfill operators who work 40 hours each week. Half of their time is spent collecting garbage and the remainder is spent at the landfill maintaining operations. In addition, there is a Public Works Director who oversees the technicians.
Burning wastes	The landfill is permitted to burn clean wood and paper waste.
Salvage Pad/Area	There is not a salvage area at the Klawock Landfill.
Additional Waste Segregation at Site	There is a place for people to drop off their vehicle batteries, located near the landfill entrance. People put their batteries in a tote which the staff collects when it is full. Scrap metal and vehicles are staged in a separate area as well.
Recycling Facility/Area	There is currently no recycling at the landfill. A collection site for aluminum cans is located in town, near the grocery store in Klawock.
Landfill Age	The landfill began operations in the 1990's.
Fencing	There is a gated fence around the entire landfill. Outside of normal operating hours the gate is closed and locked. A sign informs people of the site's operating hours.
Types of Wastes that Are Now at the Site	Municipal waste is temporary at the site prior to being shipped to Washington State. Scrap metal, glass, construction waste, and vehicles are stored on site.

## 17. SEC/SEASWA Solid Waste Management Alternatives (February 2021)

This research project aims to identify how to achieve safer and more efficient waste management for Southeast Alaska communities through mutually agreeable resolutions. Southeast Conference seeks to evaluate alternatives to decrease and control the cost of handling, processing, shipping and disposing of MSW and improve disposal services for communities through collaboration among communities. The project involved interviews with community stakeholders and review of previous studies and literature. A SWOT analysis was also conducted. The project provides community contacts, population, solid waste volume per year, recycling details, and current infrastructure and MSW practices for most of the communities interviewed or surveyed.

### Key Takeaways

- Communities involved: Kake, Sitka, Thorne Bay, Craig, Gustavus, Wrangell, Haines, Petersburg, Pelican, Kasaan, Hoonah, Coffman Cover.

- Stricter regulations for landfills to eliminate polluted runoff caused many communities to begin shipping wastes south in the early 2000s. Many landfills were also reaching their end of life in the region.
- Barge fires prompted Alaska Marine Lines (AML) to change their rules related to barging waste. Compacting and baling methods plus closed-top containers are now required to reduce the risk of fire.
- Reaching economies of scale is a challenge for many communities which results in taking a loss on MSW and recycling operations.
- Tire and junk car removal are another regional need along with local use of cardboard.

## 18. Yakutat Tlingit Tribe Environmental Department's Soil Security Stewardship (Compost) presentation & waste audit data (January 2021)

The PowerPoint presentation provides an overview of the Yakutat Tlingit Tribe's composting program establishment through the Indian Environmental General Assistance Program (IGAP) and Coronavirus Relief Fund (CARES Act). It also provides some information about the household waste stream assessment completed in 2020. It identifies planned next steps to be supported by IGAP and an NDN Collective grant. The Excel spreadsheet contains the data from the waste stream assessment.

### Key Takeaways

- The IGAP program grant included research, networking, outreach, and education activities.
- Yakutat's soil is naturally acidic and heavy rains also further strip nutrients from the soil, so compost can be a useful soil amendment.
- The project included a community survey to gauge residents' satisfaction with the existing landfill operation hours and interest in composting at the individual level and community level. There was more support for contributing to a community-wide program.
- The June 2020 household waste stream assessment included roughly 10% of households. Involved manually sorting through a week's worth of materials that a household would normally throw out.
- Yakutat is below average for waste, at 30%, but there is still a lot of material tossed in the landfill: could be up to 2,228 lbs. per week for the entire community (based on the 228 lbs. for the 10% of households in the assessment).
- There are likely seasonal fluctuations in the waste stream.
- The project also supported collaboration with Zender Environmental Health and Research Group (training), Good Earth Garden School (Master Composter classes in Palmer and communities), and Kai Environmental Consulting Services (technical support for waste stream assessment).
- Compost workshops were held in July 2019 with Good Earth Garden School that covered vermi-compost, backyard piles, and community scale approaches.
- Outreach materials/activities were produced including a webpage, Tribal membership meetings, a video, brochure, and newsletter.
- CARES funds supported purchase of land for a storage warehouse for PPE, a market garden/greenhouse, and the community compost program equipment and supplies.
- YTT purchased an in-vessel composter that is an auger driven stainless steel unit and can handle 1,100 lbs. per week of food waste (about 50% of Yakutat total household food waste).
  - Sweden based company chosen based on price, functionality in colder climates, available technical support, required capacity based on household waste assessment.
- Next steps include:
  - Develop pick-up/drop-off systems for food scraps and compost as well as operational hours.
  - Create standard operating manual.

- Host workshops and classes.
- Determine feasibility for program revenue.
- Update Yakutat Solid Waste Management Plan.
- Tribal Solid Waste Code development through Institute for Tribal Environmental Professionals (ITEP).

## 19. Southeast Solid Waste SWOT Summary (January-February 2021)

This SWOT analysis was conducted by members of SEASWA Board of Directors in a series of interviews and meetings in early 2021.

### Key Takeaways

- Top Strengths:
  - SEASWA provides collaborative solutions 89%
  - Many permitted landfills, providing access to grants to improve solid waste programs 44%
  - Marine shipping 44%
  - Electronic waste events (by tribes and others) 44%
- Top weaknesses:
  - Reliance on transporting solid waste long distances 78%
  - Lack of awareness and education for solid waste issues, practices, costs 56%
  - Unwillingness to change behavior 56%
- Top opportunities:
  - Regional solid waste management and partnerships 67%
  - Developing robust recycling programs 67%
  - Baling waste 56%
- Top threats:
  - Increased prices for shipping to L48 89%
  - Loss of access to shipping waste on barges 89%
  - Volatility regarding recycled commodities rates (metal, plastic) 56%
- Objectives:
  - Develop best practices solutions for baling and compacting solid waste for shipment
  - Increase utilization of regional recycling and composting programs and increase use of commercial burn units
  - Communicate the importance of waste sorting to citizens in communities shipping waste
  - Procure equipment to manage increasing amounts of trash tires
  - Create partnerships to share equipment such as balers and shredders across communities in the region

## 20. Community Composting in Sitka, Alaska: Opportunities for Phased Implementation (November 2021)

A graduate school project, this report discusses the environmental and financial benefits of composting at a community-wide scale; provides an overview of necessary resources and inputs for Sitka to develop a community-wide program; Discusses work of the Sitka Waste Working Group and local private composting business ventures; Reviews composting initiatives in other Alaska communities; and outlines key next steps for the Sitka Compost Project Team.

## 21. Wrangell Integrated Solid Waste Management Plan (December 2021)

This plan was developed to understand Wrangell's current waste streams and their management, identify what is going well and what needs improvement. It documents historic and recent research and current operations information and is updated frequently as a living document.

### Key Takeaways

- Wrangell has “universal service” meaning that the Public Works Department provides refuse collection to all sources of waste in the community and all waste generators are billed.
- Solid waste management operations occur at the Solid Waste Transfer Station (SWTS) on the north side of Wrangell Island, the former location of the Class III landfill that was closed and capped in 2012 after 40 years of use.
- Most waste is now collected into shipping containers at the SWTS and shipped out of Wrangell weekly via barge to Seattle.
- The SWTS accepts scrap metal, white goods/appliances, vehicles, and burnable wood/paper/cardboard.
- There is limited space at the SWTS for scrap metal due to topography and no funding or contracting mechanism for barging scrap metal out. In 2018, 2021, and 2022(?) Channel Construction of Juneau removed about 80% of the scrap metal to ship out. All costs and revenue generated were fielded by the contractor. The opportunity to dispose of scrap metal will likely be advertised to the community.
- There is a burn unit for smaller combustible items and a burn pit for larger items.
- Operations were inspected last in 2015 by ADEC with the following recommendations:
  - Upgrade burn unit (currently 8’x12’x8’) to handle larger items and eliminate the need for on-the-ground burning
  - Update operations plan for solid waste processing
  - Provide Rural Alaska Landfill Operator training for Public Works staff.
- Leachate from the closed landfill is tested for twice annually by ADEC.
- “As a result of discussions between the SEASWA Board of Directors and Republic Services, the CBW entered into a transshipment agreement for waste disposal with Republic Services Inc. that went into effect in 2013. The agreement was renewed in July of 2018; the next renewal opportunity will be 2023” (pg. 6).
  - On average, two sea containers are shipped out weekly.
- Due to barge fire risk, Wrangell purchased a baler in 2021.
- “In 2021, there are 872 residential, 120 small commercial, and 6 large commercial waste generators or accounts in Wrangell for a total of 998.” (pg. 7)
- Most regular household waste is picked up by garbage truck and delivered to the transfer station.
- Staff are not currently certified in freon removal for white goods waste.
- CBW holds an annual household hazardous waste collection event, there is an annual community clean up event, and WCA IGAP has held electronics waste collection events.
- There is a community drop off location for composting that is maintained by WCA IGAP and some residents compost at home.
- Several grocery stores bale and ship out cardboard waste and aluminum cans, and other businesses ship out scrap metal.
- Used oil is collected and burned for heat at the City Shop while discussions are occurring about using used cooking oil for biodiesel.

- “The Zender model recommends that approximately 10% of residential customers needed to be included in the waste characterization to generate a representative cross section of residential homes.” (pg. 16)
- “Wrangell has recycling for aluminum cans, however 60% of respondents dispose of aluminum in their garbage bins.” (pg. 17)
- There is currently not recycling option for plastic, so it is sent to WA in the regular waste stream.
- Styrofoam coolers from the local pharmacy shipments are another item that goes to the transfer station.
- “The mean total tonnage of annual trash shipped off-island over the past 8 years is 1,651 tons.” (pg. 11)
- “The mean total cost of annual trash shipped off-island over the past eight years is \$213,882.87.” (pg. 12)
- “The current system gets most of the municipal solid waste to an appropriate and environmentally responsible location. There is limited illegal dumping on the island and generally there is little trash in public places. The community is accustomed to the routine that has been established. Many Wrangell residents are also avid re-users of items.” (pg. 23)
- Identified MSW needs:
  - Building upgrades to the SWTS to better accommodate baling operations, improve traffic flow, and store recyclables.
  - Staff needs freon removal training to prepare white goods (refrigerators/freezers) for disposal
  - There is a community desire for a curbside or drop-off household recycling program, but there are also some barriers to implementing one soon. These barriers include:
    - Limited storage space and only a single baler at the SWTS
    - Volatility of the recyclables market
  - A clearer disposal process for yard waste is needed. Some is currently bagged and shipped south, many residents/landscapers leave yard waste on their own or client properties, and some yard waste is placed at the permitted dumpsite near the shooting range or illegally dumped along the Spur Road.
  - There is a need for a composting program and related staffing and community education initiatives about household/community composting.
  - There is a need for an annual junk vehicle/scrap metal/white good clean-up/drop-off/disposal day.
  - There is a need to implement a safe, accessible, and affordable disposal process for abrasive blast media (sand/soda/media used to remove paint from boats, cars, and other surfaces, plus the resulting paint chips).
  - Public Works needs a new garbage truck.
  - MSW collection/disposal rates should be updated to match rising costs and those of nearby communities.
  - A glass crusher could be purchased to reduce waste volumes and provide road building material, like in Gustavus.
- Areas for future study/data needs:
  - Business waste characterization
  - Quantify the amount of cardboard disposed of at the SWTS and burned by households
  - Community outreach and education to increase composting
  - Quantify annual number/volume of waste tires, scrap metal, waste vegetable oil, wood waste and/or construction materials acquired at the SWTS

**Table 1. Annual poundage of waste shipped out of Wrangell, Alaska from 2014 to 2018, including the total cost for transshipment (do not include SWTS operational costs)**

Year	Poundage (Tons)	Total Dollars
FY2014	1,616.82 Tons	\$190,258.78
FY2015	1,717.44 Tons	\$171,331.48
FY2016	1,576.59 Tons	\$189,010.12
FY2017	1,540.57 Tons	\$198,094.12
FY2018	1,581.75 Tons	\$219,852.44
FY2019	1,724.95 Tons	\$222,629.00
FY2020	1,854.19 Tons	\$250,781.00
FY2021	1,578.82 Tons	\$269,107.00

**Table 2. Projected population and annual waste generation for the Next 30 years for Wrangell, Alaska**

Year	Population	Waste (Tons)	Year	Population	Waste (Tons)
2018	2503	1581.7	2033	2653	1676.9
2019	2513	1587.9	2034	2664	1683.4
2020	2523	1594.1	2035	2674	1690.0
2021	2532	1600.3	2036	2685	1696.5
2022	2542	1606.6	2037	2695	1703.2
2023	2552	1612.8	2038	2706	1709.8
2024	2562	1619.1	2039	2716	1716.5
2025	2572	1625.4	2040	2727	1723.2
2026	2582	1631.8	2041	2737	1729.9
2027	2592	1638.1	2042	2748	1736.6
2028	2602	1644.5	2043	2759	1743.4
2029	2612	1650.9	2044	2770	1750.2
2030	2623	1657.4	2045	2780	1757.0
2031	2633	1663.8	2046	2791	1763.9
2032	2643	1670.3	2047	2802	1770.8

Figure 5. Summary of a waste stream characterization in Wrangell, Alaska in 2019.



## 22. Municipal Solid Waste to Energy for Southeast Alaska (August 2022)

This study looks at the potential for waste-to-energy (WTE) as a potential component of improved MSW management in Southeast Alaska to address aging landfills and the increasing costs of shipping MSW out of state. It provides an overview of the different types of WTE including incineration and gasification. The report includes facility overview for a variety of WTE facilities in the Lower 48.

### Key Takeaways

- Sitka, Petersburg, and Wrangell, the third, fourth, and fifth most populated communities in Southeast Alaska all ship out their wastes.
- Juneau, Ketchikan, and Haines have operating landfills.
- Waste shipment typically costs over \$150/ton.
- Average landfill tipping cost in Alaska was found to be \$142.33 per ton, which is significantly above the national average of \$53.72 per ton (Environmental Research and Education, 2021)
- 2022 tipping fee at Juneau’s landfill was \$180/ton. The landfill could be within 20 years of closure.

- An estimate of MSW generation in Southeast Alaska is 5-5.5 lbs./person/day or 180 tons total per day or 66,000 tons annually.
- For Southeast Alaska, thermal WTE might prolong landfill lifespans and offer a desirable alternative to shipping waste to the Lower 48. (pg. 4)
- To be economically feasible, WTE facilities typically need to have much higher tipping fees than those at landfills. (pg. 6)
- Factors that make WTE challenging in the Lower 48 such as low electricity prices and low landfill tipping fees are mitigated by the unique MSW management landscape in Southeast Alaska (high energy costs and high tipping fees)
- Incineration WTE may be applicable to Southeast Alaska, and there are many plants operating in the US today.
- Gasification WTE has been planned and attempted worldwide since the 1990s but no facilities were built or operated.
- “Despite transport distances being longer for shipment to the Lower 48, tipping fees for a WTE facility in Juneau would likely be at least twice those in Washington, which could make disposal in Juneau overall more costly.” (pg. 11)
- “In conventional mass burn incineration facilities, the overall efficiency is generally around 22 to 25 percent. Gasification is frequently stated to be more efficient than incineration, though lack of commercial operation data leaves this figure uncertain.” (pg. 12)
- Tipping fees for a regional WTE facility (assumed in Juneau) would need to account for different communities’ and have considerations for those with the additional cost burden of shipping their waste to Juneau. Varying tipping fees based on location for different communities could be explored.
- Ash would need to be disposed of, necessitating Capitol Landfill remaining open or construction and operation of a smaller ash landfill. Or ash would need to be shipped south.
- “Waste to Energy International estimates that a 90 tpd incineration plant would cost \$35 million and a 120 tpd facility would cost \$44 million. However, this is a very rough estimate based on existing facilities and does not account for the uniqueness of building in Southeast Alaska or a variety of design specification.” (pg. 14)
- Recommendations:
  - Explore incineration as a WTE solution for Southeast Alaska.
    - Contract an engineering firm with WTE experience in Alaska.
  - Better classify the region’s MSW.
    - Estimate and characterize energy potential from the MSW stream

## 23. 2023 Summary City of Sitka Solid Waste Transport and Disposal (January 2024)

This short document provides a summary of the total tonnage of MSW transported from Sitka and disposed of at Republic Services’ Roosevelt Regional Landfill in 2023. Several charts and graphs are provided.

### Key Takeaways

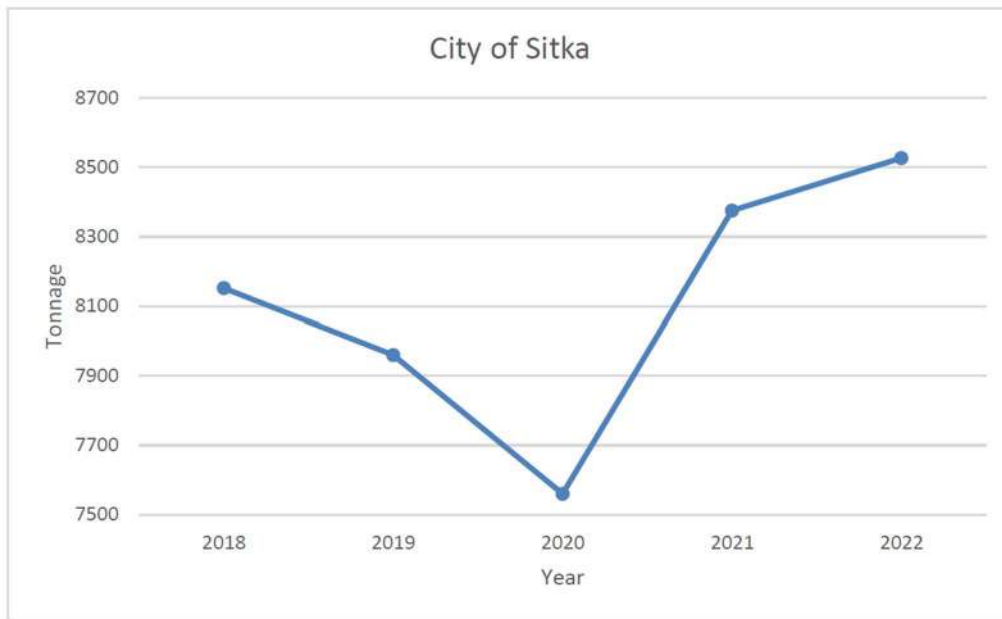
- A total of 7,617.64 tons were transported and disposed of in 2023.
- This comprised 292 loads with an average of 26.09 tons per load.

**Total monthly tonnage transported from Sitka and disposed of by Republic Services in 2023.**

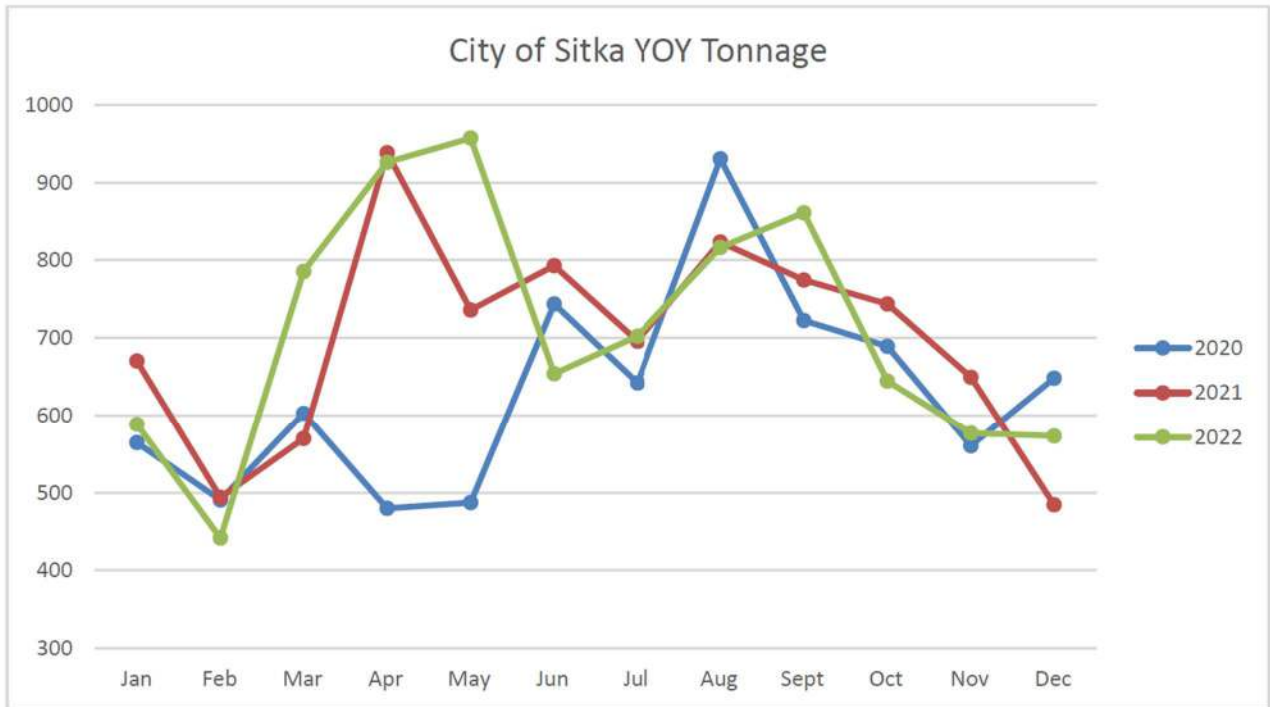
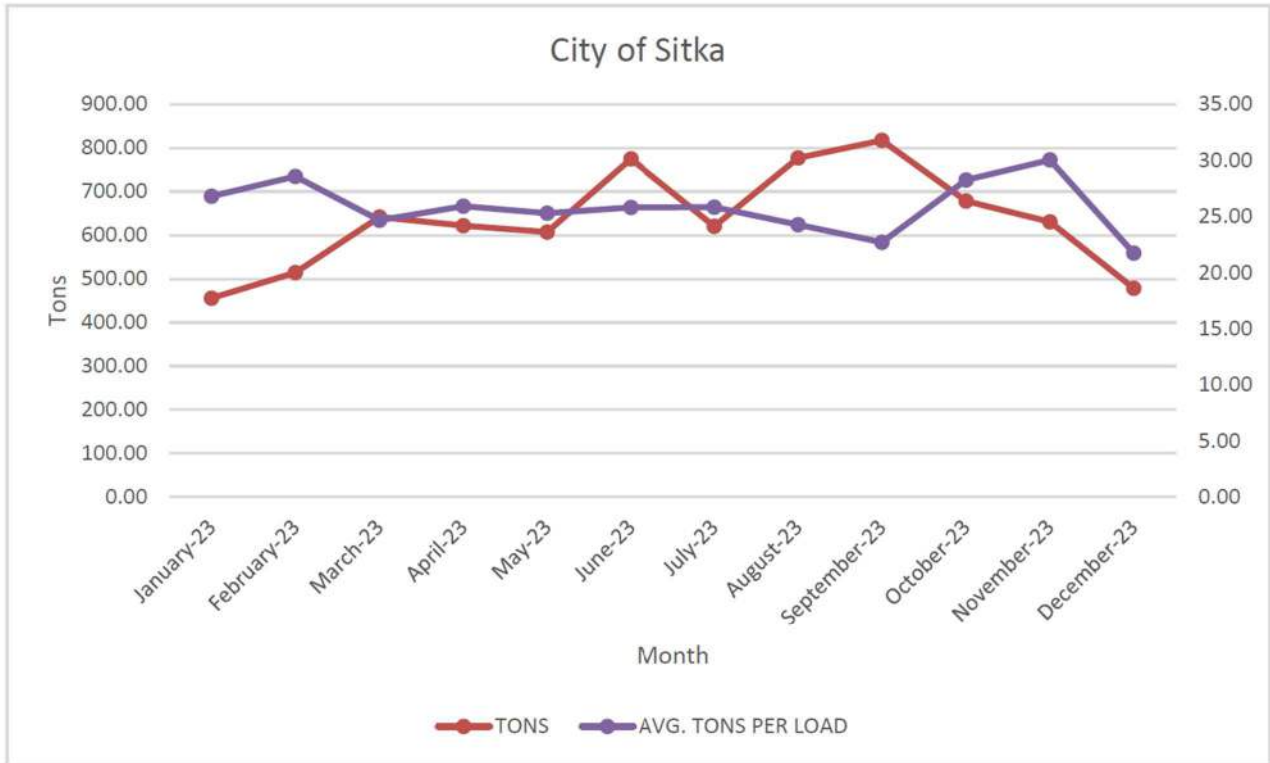
<b>TONNAGE ACCEPTED AT ROOSEVELT REGIONAL LANDFILL</b>			
<b>Type: MSW</b>			
<b>MONTH</b>	<b>TONS</b>	<b>LOADS</b>	<b>AVG. TONS PER LOAD</b>
January-23	455.85	17	26.81
February-23	514.12	18	28.56
3/1/202	641.75	26	24.68
April-23	621.95	24	25.91
May-23	607.39	24	25.31
June-23	774.60	30	25.82
July-23	620.36	24	25.85
August-23	777.01	32	24.28
September-23	817.22	36	22.70
October-23	678.35	24	28.26
November-23	543.92	18	30.22
December-23	564.12	19	29.69
<b>TOTALS</b>	<b>7,617.64</b>	<b>292</b>	<b>26.09</b>

*\*Created On 1/10/2024*

**Year-over-year comparison of total MSW tonnage from Sitka.**



Total MSW tonnage from Sitka by month (top) and years comparison (bottom).



## 24. City and Borough of Juneau Waste Characterization Study Final Report (September 2024)

This study had the following objectives: establish baseline data on Juneau’s solid waste generation; inform the creation of future diversion/reduction programs and policies by identifying and quantifying waste streams; assist with CBJ’s solid waste planning efforts. The study provides critical data for determining Juneau’s future solid waste disposal and diversion options.

### Key Takeaways

- The results will inform a forthcoming CBJ study considering the feasibility of:
  - A) building a new landfill
  - B) building a waste-to-energy (WTE) facility
  - C) building a transfer station to ship all waste south to the Lower 48.
- Currently, CBJ has no “flow control” over the community’s waste because they do not own the only landfill which is expected to close in the next 10-15 years and does not manage the public utility for hauling waste.
- CBJ’s goal is to gain a level of control over Juneau’s MSW in order to provide transparency and public input into decisions affecting waste disposal.
- “In 2023, the Juneau community collected a combined 22,346 tons of material in the overall commercial, residential, and self-haul disposed waste streams. Of that material, 81% (18,013 tons) was recoverable: 18% (4,025 tons) was recyclable, 32% (7,083 tons) was compostable, 22% (4,998 tons) was potentially recoverable through specialty diversion programs, and 9% (1,907 tons) was reusable (Figure 1). The remaining 19% (4,333 tons) was non-recoverable.” (pg. 2)
- The study looked at 4(?) sectors and 2 subsectors of waste:
  - Commercial waste
    - Commercial packer waste
    - Commercial roll-off waste
  - Residential waste
  - Self-haul waste

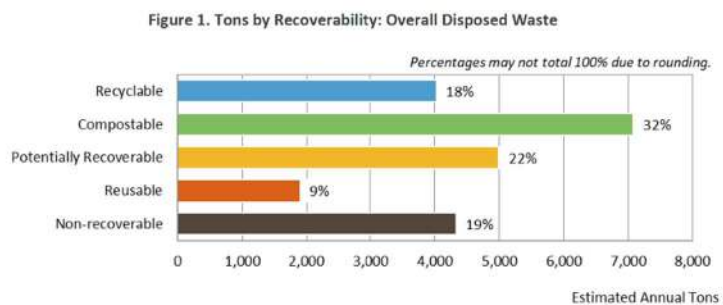


Table 1. Disposed Waste Tons by Sector, 2023

Sector	2023 Disposed Waste Tonnage
Overall Commercial	11,388
Commercial Packer	6,029
Commercial Roll-off	5,360
Residential	7,985
Self-haul	2,973
<b>Overall Disposed Waste</b>	<b>22,346</b>

## 25. Juneau Solid Waste Disposal Facility and Capital Costs – Technical Memorandum (March 2025)

This is a high-level study of three potential long-term solutions for solid waste management in Juneau. The study evaluates capital cost and technical feasibility of three scenarios:

- A. Construct a new landfill and transfer processing facility with recyclables sent south by barge for diversion. (\$59M-\$182M)
- B. Construct a transfer processing facility with waste and recyclables sent south by barge for recycling and disposal. (\$14M-\$40M)
- C. Construct a waste-to-energy (WTE) facility and transfer processing facility for municipal solid waste (MSW) with non-combustibles, recyclables, and ash sent south by barge for disposal. (\$99M-\$110M)

### Key Takeaways

- CBJ currently does not have control over the waste stream or a role in waste management, with curbside collection provided by Alaska Waste and the landfill owned and managed by Waste Management.
- The Capitol Disposal Landfill is expected to reach capacity and close within the next 10 years.
- The most feasible option as identified in the report is Scenario B, followed by Scenario A, and then Scenario C.

Table 6. Pros, Cons, Cost Ranges, and Relative Feasibility Rankings for Each Scenario

Scenario	Capital Cost Range <sup>[a]</sup>	Pros	Cons	Feasibility Ranking
A. Construct a new landfill and transfer processing facility with recyclables sent south by barge for diversion.	Transfer Processing Facility = \$9 million – \$20 million 50-year Landfill <sup>[b]</sup> = \$50 million – \$162 million <b>Total = \$59 million – \$182 million</b>	<ul style="list-style-type: none"> <li>▪ High level of control over operating costs, rates, and solid waste flow.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Construction of a new landfill is expensive.</li> <li>▪ Siting and permitting likely to take an extensive amount of time.</li> <li>▪ Operating costs would be sustained by the CBJ unless the CBJ enters into an operating agreement with a private company.</li> <li>▪ Leachate treatment and stormwater management could be a significant cost factor.</li> </ul>	2
B. Construct a transfer processing facility with waste and recyclables sent south by barge for recycling and disposal.	<b>Transfer Processing Facility = \$14 million – \$40 million</b> (offsite shipping costs negotiated in transportation contract)	<ul style="list-style-type: none"> <li>▪ No capital costs to construct a new solid waste management facility.</li> <li>▪ Minimal regulatory requirements without a landfill or WTE facility.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Offsite transportation costs, impacts, and availability of markets to accept material are outside of CBJ control; exposure to financial risks.</li> <li>▪ Operating costs are transferred into higher fees from the hauler and operator.</li> </ul>	1
C. Construct a WTE facility and transfer processing facility for MSW with noncombustibles, recyclables, and ash sent south by barge for disposal.	Transfer Processing Facility = \$9 million – \$20 million WTE = \$90 million <sup>[c]</sup> <b>Total = \$99 million – \$110 million</b>	<ul style="list-style-type: none"> <li>▪ High level of control over operating costs, rates, and solid waste flow.</li> <li>▪ Minimizes solid waste volume and land use impacts.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Diversion would likely be minimized to optimize efficiency of energy recovery.</li> <li>▪ No potential for revenue from net metering.</li> <li>▪ Does not improve the renewable energy profile for the CBJ.</li> <li>▪ WTE requires a high level of expertise and is more expensive to construct and operate than the other scenarios.</li> </ul>	3

<sup>[a]</sup> Capital costs are not applied over the same time period across all scenarios. For example, the landfill capital would be applied over a 50-year period, while the transfer station and WTE may require significant replacement capital over the same 50-year period. Assessment of these factors would be completed with a more comprehensive economic analysis.

<sup>[b]</sup> Landfill construction costs are calculated based on the estimated size and capacity of a 50-year landfill for the CBJ. Costs can vary significantly depending on the operating conditions and geometry of the landfill. The provided estimates are conservative.

<sup>[c]</sup> This estimate is considered an order-of-magnitude Class 5 as defined by AACE International with a range of accuracy between +100% to -50%. The capital cost for a WTE facility was derived using different estimating methods than for a landfill and transfer processing facility, and the variability in the estimate is reflected in this range of accuracy.