

Integrated Solid Waste Management Plan 2024

November 2024

CONFEDERATED TRIBES OF COOS, LOWER UMPQUA, AND SIUSLAW INDIANS
INTEGRATED SOLID WASTE MANAGEMENT PLAN

Coos Bay, Oregon

Prepared for

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians

Prepared by

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EXECUTIVE SUMMARY

This Integrated Solid Waste Management Plan (ISWMP) was prepared to guide and support the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI or Tribes) in maintaining and improving environmental quality and reducing costs through proper management of solid waste. It is designed to provide a strategic approach that will allow the Tribes to answer three basic questions about solid waste management: (1) Where are we now? (2) Where do we want to go? (3) How do we get there?

This ISWMP contains information needed to answer the first question. The Strategic Implementation Plan provided in Appendix F is a critical part of the ISWMP providing the structure, framework, and guidance for the Tribes to answer the second and third questions.

This ISWMP builds on the previous ISWMP that the Tribes developed in 2013, and considers changes in the Tribes' population, land base, facilities, and enterprises. It considers changes in Oregon state laws and policies and changes in available waste management options and costs associated with solid waste collection, handling, and disposal.

The Strategic Implementation Plan (Appendix F) provides a relatively simple and useful roadmap that will guide the Tribes during the next five years (2024 – 2028) as they endeavor to implement initiatives to support the accomplishments of the Tribes' solid waste management goals.

The objective of this ISWMP is to maintain and improve Tribal environmental quality and reduce costs through proper management of solid waste. To support the Tribes' efforts to achieve this objective, this ISWMP does the following:

1. Describes current waste management practices.
2. Identifies needs, challenges, and opportunities for improvement.
3. Recommends approaches to address needs and challenges to reduce waste management costs and environmental impacts.

This ISWMP addresses three major categories of solid waste generators:

1. Tribal residents (in Tribally managed housing and private housing)
2. Tribal facilities (administrative offices, services, and infrastructure)
3. Tribal enterprises (casinos, golf course, and planned future developments)

The ISWMP includes quantitative estimates of the types and quantity of waste being generated. The estimates are based on waste stream composition studies conducted by Oregon Department of Environmental Quality. Food waste, paper, and plastic are the largest categories of waste generated by households and commercial businesses. The waste streams from Tribal administrative offices and services are different in some respects but are probably similar in composition.

Currently, the Tribes are paying multiple waste disposal companies to manage waste from facilities and Tribal housing. The cost of waste management at the casinos, golf course, RV park, and for individual Tribal members living outside Tribal housing areas are separate from the costs being paid by the Tribes. Waste management costs for garbage disposal represent the largest percentage of total waste management costs; therefore, diverting a portion of this waste stream away from landfill to recycling or composting facilities could substantially reduce costs.

This ISWMP also provides projections of future solid waste quantities and costs, which are anticipated to increase if active measures are not taken to reduce waste generation and divert solid waste away from disposal and into recycling and composting. If per capita waste generation rates remain close to current rates, CTCLUSI should expect its total residential waste generation and associated disposal costs to increase by 25 percent in 10 years.

Conclusions and recommendations are provided in Section 9 and identify alternatives for waste management aimed at reducing waste management costs and adverse environmental impacts.

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LIST OF ABBREVIATIONS AND ACRONYMS

BIA	Bureau of Indian Affairs
CHAMP	Coos Head Area Master Plan
CTCLUSI	Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
degrees F	degrees Fahrenheit
HUD	U.S. Department of Housing and Urban Development
ISWMP	Integrated Solid Waste Management Plan
IHS	Indian Health Service
IT	Information technology
ITEP	Institute for Tribal Environmental Professionals
ODEQ	Oregon Department of Environmental Quality
PRO	Producer Responsibility Organization
PSU	Portland State University
RV	Recreational Vehicle
SWAC	Solid Waste Advisory Committee
SWIFR	Solid Waste Infrastructure for Recycling
Tribes	Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

This Integrated Solid Waste Management Plan (ISWMP) was prepared to guide and support the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI or Tribes) in maintaining and improving environmental quality through proper management of solid waste. It is designed to provide a strategic approach that will allow the Tribes to answer three basic questions about solid waste management: (1) Where are we now? (2) Where do we want to go? (3) How do we get there?

This ISWMP builds on the previous ISWMP which the Tribes developed in 2013 (CTCLUSI, 2013), and considers changes in the Tribes' population, land base, facilities, and enterprises. It considers changes in Oregon state laws and policies and changes in available waste management options and costs associated with solid waste collection, handling, and disposal.

1.1 Goals and Objectives

The objective of this ISWMP is to maintain and improve Tribal environmental quality through proper management of solid waste.

Goals that support and will lead to the accomplishment of this objective are:

- Describe current waste management practices and challenges and identify potential actions and initiatives to improve the current situation.

- Identify waste management needs for Tribal facilities and residents, develop options, and identify cost-effective approaches to address these needs.

- Identify opportunities to reduce waste generation by promoting waste reduction and diverting reusable, recyclable, and compostable materials out of the current waste stream.

- Review existing Tribal codes and regulations and recommend potential management and enforcement measures to address illegal dumping and disposal of solid waste on Tribal lands and properties.

1.2 Climate Change

There are several aspects of solid waste management that contribute to climate change, many of which can be addressed and altered to lessen their impact. Hauling and disposal of solid waste requires significant amounts of energy and releases harmful emissions into the atmosphere. The

equipment used to collect, haul, and handle solid waste is fueled by gasoline and diesel. Burning these fuels in internal combustion engines releases carbon dioxide and other greenhouse gases into the atmosphere. These gases contribute to an increasingly dense atmosphere that holds solar heat in the thin layer of air that surrounds the earth, increases global temperatures, and contributes to adverse climate change. By reducing the volume of solid waste that must be collected, hauled, and handled, emissions of these greenhouse gases can be reduced thus reducing the adverse effects of climate change.

Greenhouse gases are emitted into the atmosphere whenever solid waste is burned in incinerators, open dumps, and burn piles. Landfills also generate and emit methane gas as waste decomposes. Due to its chemical composition, methane is 80 times more detrimental to the atmosphere than an equal volume of carbon dioxide (MIT, 2023). By working to reduce solid waste generation and to divert waste away from landfills and into composting or recycling facilities, lower volumes of greenhouse gases will be released into the atmosphere, thus reducing human impacts on climate change.

However, recycling and composting also have some climate change impacts, as they also require hauling of waste to transfer stations and recycling and composting centers; therefore, reduction of overall waste volumes by reducing consumption and increasing reuse and repair of used goods is the best way to reduce climate change impacts.

Integrated solid waste management planning serves to develop systems that reduce waste generation and allow for management of solid waste collection, handling, and disposal in a more environmentally sound manner. Changing not only the waste disposal methods but reducing the waste stream volume and composition is the most effective way to reduce climate change impacts.

1.3 Waste Generators

This ISWMP addresses the waste generation from several sources within the Tribes' traditional territory, properties, and facilities. This section is organized by types of Tribal facilities, properties, and areas.

- Residences
    - Tribally owned housing
        - Qa'aich Development (Florence)
        - Qaxas Heights (North Bend)
        - Tribal housing in Coos Bay

    - Privately owned housing occupied by Tribal members
- Tribal facilities
    - Tribal Hall and Community Center (Coos Bay)
    - Government Offices (Coos Bay)
    - Housing Department (Coos Bay)
    - Laboratory (Coos Bay)
    - Dental Clinic (Coos Bay)
    - Community Garden (Coos Bay)
    - Wastewater Treatment Plant (Florence)
    - Outreach Office (Florence)
- Tribal enterprises
    - Three Rivers Casino (two locations: Florence and Coos Bay)
    - Golf Course (Florence)

During September 2023, a Ridolfi field team visited these locations to conduct reconnaissance within the Tribes' properties and facilities and obtain information from Tribal managers on waste collection practices, goals for waste management, potential improvements, and future expansion plans. Photographs from the Ridolfi field team site visit are included in Appendix E.

2.0 CTCLUSI TRUST LANDS AND FEE LANDS

2.1 History

The history of the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI) is summarized in this section. A more detailed history is available at https://ctclusi.org/history/.

The CTCLUSI are made up of three Tribes that trace their ancestry to the aboriginal inhabitants of what is now the South-Central Oregon Coast. The people lived in villages of cedar plank houses along the Siuslaw, Umpqua, and Coos Rivers and moved seasonally for hunting, fishing, and gathering, staying in seasonal camps.

Non-indigenous traders first came to the region in the early 1800s, followed by settlers. In 1855, the U.S. government wrote a treaty with the Tribes that would allow U.S. settlers to occupy the Tribes' traditional lands, and would compensate the Tribes with food, clothing, employment, education, and health benefits. The Tribes signed, but Congress failed to ratify the treaty and in 1856, the U.S. government forcibly incarcerated the Coos and Lower Umpqua people in a military fort.

In 1860, the U.S. government forced the Tribes to move to a reservation in Yachats, give up their traditional hunting, fishing, and gathering culture, and farm on land that was ill suited for agriculture. During this period, 50 percent of the Tribal members died due to the harsh conditions and disease.

In 1916, the Tribes established an elected Tribal government.

In 1941, the Bureau of Indian Affairs established a small set of Tribal facilities in Coos Bay, including a Tribal Hall, offices, and clinic.

In 1954, the U.S. Government unilaterally terminated recognition of the Confederated Tribes. In 1984, federal recognition was restored.

2.2 Land Use

The lands of the CTCLUSI Ancestral Territory encompasses 1.6 million acres of lands at or adjacent to the Pacific Ocean. The landscape ranges from beaches to coastal lakes to rivers to dunes and forests. The area remains relatively low in population density and contains some of North America's most extensive forests. The region contains a diversity of natural resources for industries such as mining, logging, fishing, agriculture, and tourism.

Figure 1 through Figure 5 show CTCLUSI lands, including trust lands and fee lands. These lands are spread across portions of the Tribes' Ancestral Territory, but do not comprise a contiguous reservation. The five counties of Coos, Curry, Douglas, Lane, and Lincoln comprise the Five-County Service Area in which CTCLUSI provides services to Tribal members.

The territory includes urban areas (Coos Bay, Reedsport, and Florence), rural areas with low population density, and natural areas (forests, beaches, and other natural habitats).

2.3 Demographics

Of the 1,331 enrolled Tribal members, 733 live in Oregon, and 499 live in the Five-County Area of Coos, Curry, Douglas, Lane, and Lincoln counties. Most members are concentrated in Coos and Lane Counties (data provided by CTCLUSI, October 2023).

Location	Population
All enrolled CTCLUSI members	1,331
Oregon	733
Five-County Area	499
Coos County	223
Coos Bay	96
North Bend	90
Curry County	3
Douglas County	38
Lane County	209
Eugene	78
Springfield	54
Florence	32
Lincoln County	26

2.4 Residential

The Tribes own two residential housing developments known as Qa'aich and Qaxas Heights.

- Qa'aich Development is located in Florence and consists of two fourplexes that provide homes for approximately 11 residents.
- Qaxas Heights is located in North Bend and consists of houses, duplexes, and fourplexes that provide homes for approximately 65 residents.

The Tribes owns a single residential property in Coos Bay (1370 Neese).

In addition, approximately 18 Tribal members live in housing provided by U.S. Department of Housing Urban Development (HUD) consisting of four residential properties on Clay Street, Harriet Street, and Flanagan Street in Coos Bay.

There are approximately 400 Tribal members in the Five-County Area who live in private housing. This ISWMP addresses waste management practices and options for these members who live in private housing. To provide a focused scope for evaluation and planning within the Five-County Area, this ISWMP does not directly address waste management for Tribal members who live outside the area; however, the guidance and recommendations in this ISWMP should be shared with all Tribal members and will probably benefit Tribal members who live outside the Five-County Area.

2.5 Tribal Services

Most Tribal services facilities are in Coos Bay. Tribal facilities in Coos Bay include the Tribal Hall and Community Center, Tribal administrative offices, Housing Office, healthcare center, dental clinic, laboratory, library, Plank House, and Community Garden. Tribal departments that operate from facilities in Coos Bay include financial, health and human services, forest management, facilities maintenance, information technology (IT), Tribal police and emergency management, and department of culture and natural resources.

The Tribes hosts annual events and gatherings at the Coos Bay facilities. Additionally, the Tribes operate an outreach center in Florence.

The Tribes also own a house at Coos Head that is currently not occupied but is designated as an administration building.

2.6 Tribal Enterprises

The main Tribal enterprises are the Three Rivers Casino and Resort and the Ocean Dunes Golf Links. The Casino has two locations. The larger casino is in Florence and includes a casino, restaurants, 93 rooms for lodging, and recreational vehicle (RV) parking. The golf course is also located in Florence. The newer, smaller casino is located in Coos Bay adjacent to the Tribal Community Center. It does not include lodging but has a restaurant and gift shop.

3.0 CURRENT SOLID WASTE GENERATION RATES AND COMPOSITION

The quantities of solid waste generated by the Tribes were estimated based on consultation with the casino management, data from other casinos, and waste generation data compiled by the Oregon Department of Environmental Quality (ODEQ).

ODEQ publishes an annual *Oregon Material Recovery and Waste Generation Rates Report*. The most recent was published in 2023 with data from 2021 (ODEQ, 2023). It showed increased waste generation compared to the previous year, and similar but somewhat reduced recovery rates.

The solid waste from CTCLUSI sources can be divided into three major categories: residential sources, Tribal facilities, and Tribal enterprises. The waste quantities from the enterprises (casino, resort, and golf course) are estimated based on typical waste generation rates from similar enterprises owned by other tribes. Waste quantities from residential sources are estimated based on an estimated residential disposal rate of 0.32 tons per person per year (Cascadia, 2021). Waste quantities attributable to the Tribal facilities are estimated using the cost information described in Section 4.5 of this report and typical costs per ton for waste management. Table 2 summarizes the estimated waste quantities generated by each source. These estimates are provisional, based on the data available, and may be revised if more specific information including volumes and weight becomes available.

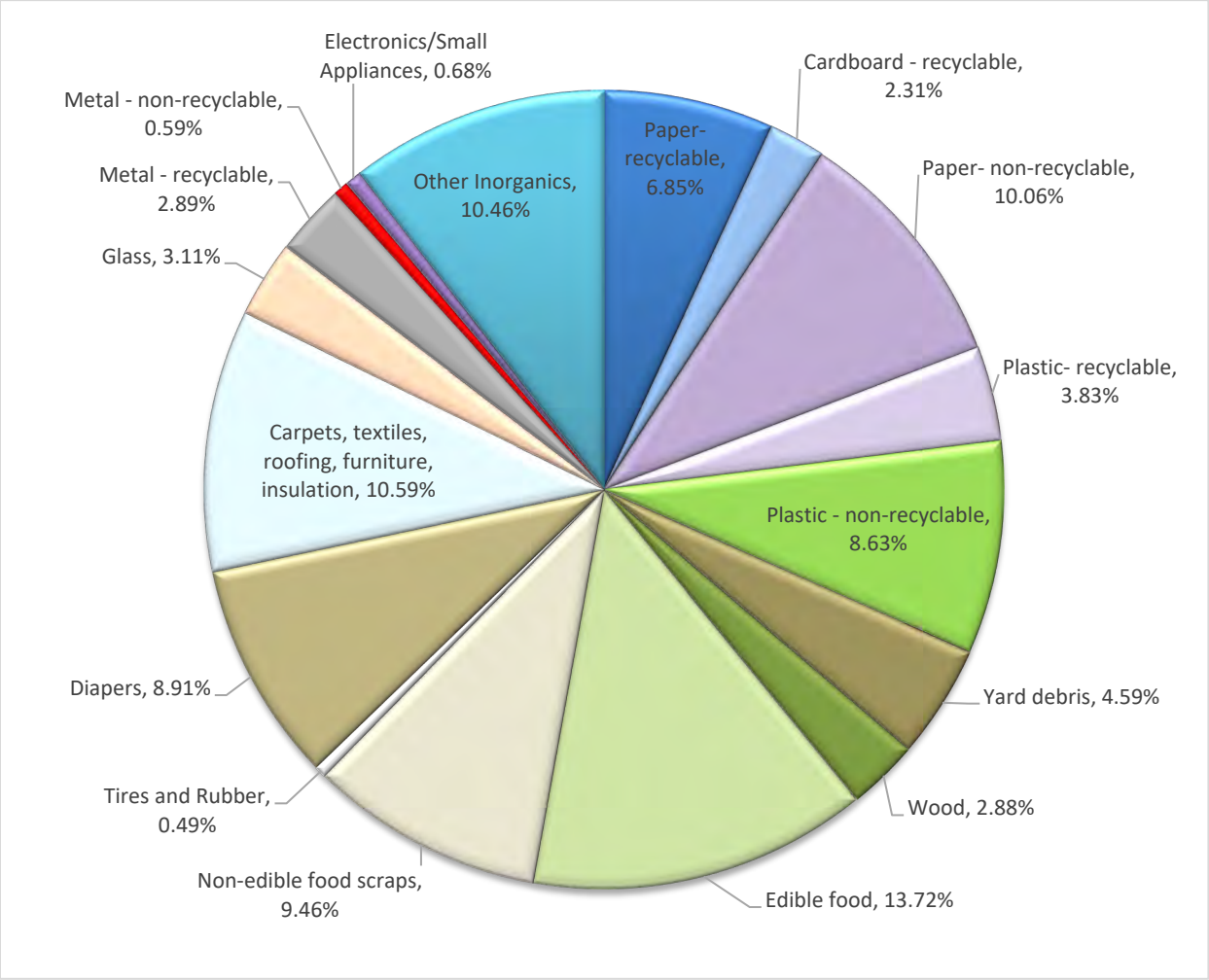
The recovery rate is defined as the percentage of waste that is recycled, composted, or burned to generate energy. The statewide recovery rate in 2021 was 37.7 percent, down from 42.0 percent the previous year. The reduction is due in large part to large amounts of nonrecoverable debris generated by wildfires in 2021 (ODEQ, 2023).

The most recent waste composition survey available for Oregon is from 2016 – 2017.[1] The most relevant data to the CTCLUSI Five-County Area is the "Downstate" data that includes all counties in the state except for the Portland metropolitan area. Table 1 describes the waste categories used to classify solid waste. Table 2 uses data from the Oregon waste composition survey to estimate the quantity of solid waste generated in each waste category from each source (residential, facilities, enterprises, and self-haul).

[1] In 2023 and 2024, ODEQ updated its waste composition study. Preliminary results were presented at a conference but the data have not yet been published as of November 2024. A future revision of this ISWMP could use the updated data. https://www.oregon.gov/deq/mm/Pages/Waste-Composition-Study.aspx

3.1 Residential

The chart below shows the types of solid waste generated from residential pickups and transported to disposal facilities.



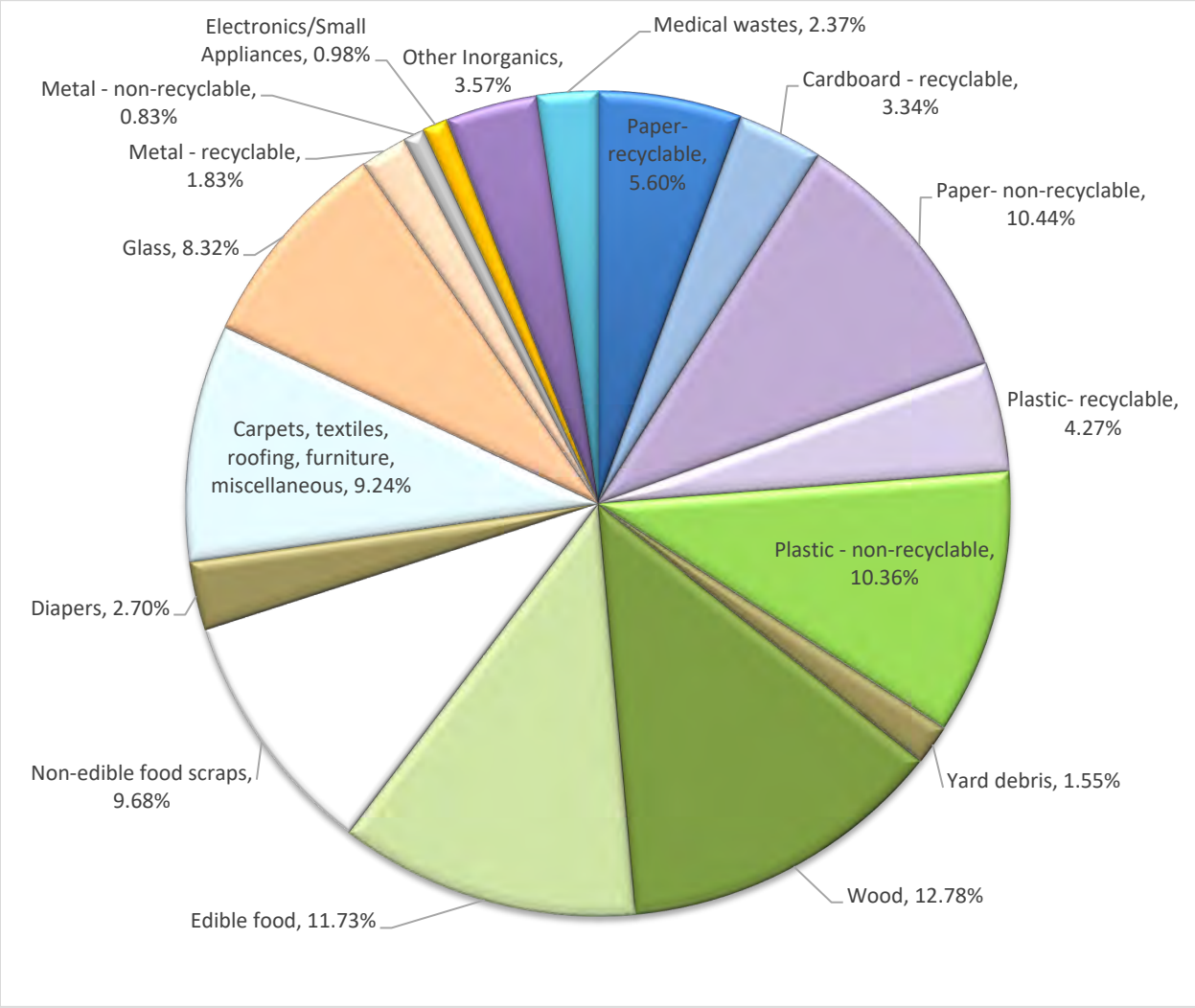
Food waste is the largest category (green) followed by paper and plastic (blue and purple). Diapers (white) represent 9% of residential solid waste, a significant proportion. Glass and metal are relatively small percentages of the total. Dirt, rocks, and pet litter are combined and represent about 11% of residential solid waste, another significant proportion.

Recyclable materials (paper, plastic, glass, and metal) total approximately 20% of the solid waste stream. Compostable materials (food, yard debris, and some wood waste—depending on its condition) total approximately 30%.

Some residential waste is taken to self-haul facilities for disposal, rather than being picked up by garbage collection trucks. The composition of this self-haul waste includes more wood, building materials, and furniture. It contains less food waste, plastic, and paper compared to the residential pickup waste (ODEQ, 2023). Some residential waste is burned in burn piles rather than transported to disposal facilities. The composition of the waste being burned is similar to the composition of self-hauled waste and includes wood, yard debris, and household garbage, including plastics. Reducing the frequency of burning and the quantity of waste being burned is a high priority of the Tribes.

3.2 Tribal Facilities

Based on ODEQ waste composition data, the composition of the solid waste stream from Tribal facilities was estimated. These results are generally similar to the waste generated by households; however, the facilities waste stream contains higher proportions of medical waste, wood, and glass and lower proportions of diapers, yard debris, dirt, and rocks.



3.3 Tribal Enterprises

Information from a tribal casino and golf course in Washington State was used to estimate the waste generation rates for the Casinos and Golf Course, and data from the ODEQ waste composition survey was used to estimate waste stream composition.[2] These assumptions and estimates are supported by observations and publicly available photographs of the casino, hotel, and golf course from Google Maps and the casino's website. Table 3 and Table 4 provide estimates of the waste generation quantities and composition for each Tribal enterprise. The casino's food and beverage director and controller reviewed and confirmed these estimates.

[2] Average waste composition for commercial waste was used in the absence of site-specific data, and it was assumed that the golf course would generate proportionally more yard waste and lawn clippings than other types of waste.

Landscaping of the golf course and gardens containing flowers, shrubs, and trees near the parking area and outside the casino generates yard waste. The golf course plant clippings are disposed of as compostable materials at the transfer station in Florence. The casino's landscaping service provider takes away the landscaping clippings for disposal. Specific information regarding where this waste is disposed of was not available, but it is probably combined with other plant clippings and composted.

Photographs of the restaurant show that they use reusable plates, silverware, napkins, and glasses at the restaurant tables. Disposable plastic cups and straws and paper napkins are used for drinks from the bar. Photographs of the hotel rooms show K-cup coffee brewing machines, individually wrapped bars of soap, and other items that would generate non-recyclable trash.

4.0 CURRENT SOLID WASTE MANAGEMENT SYSTEMS

4.1 Oregon

State authority over activities on Indian reservations is generally limited; however, tribes are required to comply with federal laws and regulations. In the absence of specific federal laws and regulations, tribes may, at their discretion, adopt or incorporate state laws and regulations to address environmental issues.

ODEQ is the agency responsible for waste management in the State of Oregon. Oregon has shifted its approach from "solid waste management" (focused on diverting waste from garbage to recycling and composting) to "materials management" (a full lifecycle approach, including reducing waste, promoting reuse, minimizing packaging, and substituting materials that have less environmental impacts than alternatives).

4.1.1 Current Conditions

Currently, Oregon sets recycling goals for each "wasteshed" (county). Oregon law requires cities with population over 4,000 people to provide a recycling program. Over 80% of the CTCLUSI residents of the Five-County Area live in municipalities of over 4,000 people. Currently, different counties and municipalities have different recycling programs that allow for recycling of different materials, depending on the capabilities and preferences of recycling service providers.

One standard statewide recycling program is driven by the Oregon Bottle Bill, which establishes collection programs for recycling of aluminum cans, glass, and plastic bottles and supports a payment of 10 cents per bottle to encourage recovery. Compared to commingled recycling in curbside bins or transfer stations, the bottle collection centers allow for more efficient recycling since the incidence of contamination with other materials is minimized when bottles are recycled alone. Two facilities in the CTLUSI service area are:

- North Bend/Coos Bay Redemption Center - BottleDrop
- Fred Meyer Florence - Partner Retailer Drop Location - BottleDrop

Smaller-scale bottle drop locations are located at local grocery stores throughout the Five-County Area; however, these smaller bottle drop locations are often overcrowded, overloaded, and inefficient.

4.1.2 Anticipated Changes

Oregon passed the Plastic Pollution and Recycling Modernization Act in 2021. ODEQ is conducting studies and preparing for the law to take effect in 2025. The law is intended to promote recycling by expanding and standardizing the list of materials that can be recycled to make it consistent statewide. The law aims to ensure that recycling is done responsibly to address problems with materials being shipped overseas to unregulated facilities. The law creates producer responsibility organizations (PROs) that are intended to incentivize waste reduction (for example, changing food packaging to use less materials or less impactful materials). Based on their waste production, the PROs will be required to provide funding to local governments for recycling.

4.2 Counties

Waste management services vary by county as described in this section. Of the five counties, only Lane County has a published Waste Management Plan (Good Company, 2019). The other counties provide some resources and information on their websites.

4.2.1 Coos County

Coos County has a transfer site open Tuesday through Saturday for drop-off of trash and recycling. Fees are charged based on the quantity and type of waste, with temporary fee waivers granted periodically. For example, in Fall 2023, the facility waived fees for appliances and scrap metal. Fee information is listed at https://www.co.coos.or.us/solid-waste/page/solid-waste-fees
The cities of Coos Bay and North Bend have trash and recyclable materials pickup but do not collect yard waste or food waste for composting.

4.2.2 Curry County

Curry County has trash and recyclable materials pickup for residential and commercial customers. Users can select various sizes of bins or dumpsters. Most areas have weekly pickup, but collection is less frequent in some areas. Recyclable materials can be dropped off at transfer stations at no charge. Disposal fees are charged for hazardous materials such as electronic waste, tires, and batteries. https://www.currytransferrecycling.com/home/

4.2.3 Douglas County

Douglas County has transfer stations for the public to drop off trash, recyclable materials, and yard waste (https://douglascountyor.gov/396/Solid-Waste).
Douglas County also has a Free Materials Exchange to help with reuse, recycling, and disposal of materials such as cooking oil, antifreeze, scrap metal, batteries, building materials, light bulbs, clothing, tires, and Styrofoam.
https://douglascountyor.gov/BusinessDirectoryII.aspx?lngBusinessCategoryID=31).
https://douglascountyor.gov/DocumentCenter/View/22123/DCSW-Recycle-Options-PDF?bidId=

Roseburg Disposal Company provides collection of trash and recyclable materials in some areas within Douglas County.

4.2.4 Lane County

Lane County has a solid waste management plan dated 2019. Lane County has the highest waste recovery rate in the State of Oregon. This recovery rate is the percentage of waste that is recycled or otherwise diverted from landfill disposal (Good Company, 2019). Lane County has a goal of 63% recovery by 2025. Lane County has transfer stations for the public to drop off trash, recyclable materials, and yard waste, and accepts appliances and other materials for a fee. Lane County has several organics processing facilities that convert post-consumer food waste to energy.

Springfield and Eugene have residential pickup service for garbage, commingled recyclable materials, and yard waste.

https://springfield-or.gov/city/development-public-works/recycling/ , https://www.eugene-or.gov/2932/Residential

Florence has pickup service for garbage and recyclable materials but does not have a separate collection service for yard waste and food waste. They advise residents to dispose of yard waste and food waste in the trash or to drop off yard waste and garden trimmings at a transfer station.

https://www.countytransferandrecycling.com/

4.2.5 Lincoln County

Lincoln County has curbside pickup in some areas and has transfer stations for disposal of waste and recyclable materials.

https://www.co.lincoln.or.us/387/Solid-Waste-District

4.3 Tribal Departments Involved in Waste Management

Currently, waste management is decentralized within Tribal departments. Each Tribal department generally handles its own solid waste, and each facility manages waste differently. The following Tribal departments have a role in waste management and planning.

Housing Department

This department contracts for residential trash disposal for Tribal housing areas and deals with illegal dumping within or near the residential areas.

Finance Department

This department pays for waste pickup and disposal services and maintains cost accounting records for Tribal departments.

Tribal Police Department

The police department investigates illegal dumping and enforces laws that prohibit illegal dumping.

Compliance Department

This department generates substantial amounts of paper waste and is working towards a paperless system to reduce and minimize wastepaper.

Forestry Department

This department deals with illegal dumping on Tribal forest lands that it manages.

Department of Culture and Natural Resources

This department generates yard waste as it clears vegetation (trees and brush) and constructs habitat restoration projects. Most of this organic waste is currently landfilled; however, a large portion could probably be reused or composted. This department currently manages the ISWMP, promotes waste and recycling initiatives, investigates contaminated lands and waters, and protects cultural and natural resources from contamination and other impacts.

Facilities and Maintenance Department

This department has a burn pit for wood waste, much of which is generated during housing construction and demolition of buildings. This department also manages waste generated from landscaping and illegal dumping. The Facilities and Maintenance Department cleans up homeless encampments from which a large volume of solid waste is removed, and this results in substantial waste disposal costs.

Health Department

This department generates medical waste and dental waste that must be collected, handled, and disposed of by specialized contractors. This department handles a substantial volume of laundry associated with uniforms and rags and is interested in improving laundry operations to increase efficiency and reduce cost.

IT Department

This department must handle and properly dispose of electronic waste on a regular basis. Electronic waste includes computers, monitors, docking stations, printers, batteries, chargers, and related IT equipment.

Laboratory

The laboratory generates packaging waste (including Styrofoam and plastic) and special wastes including materials classified as biohazards.

Casino Operations

Casino operations management collects, handles, and disposes of solid waste from the casinos including the hotel and restaurants.

Wastewater Treatment Plant

The treatment plant in Florence treats wastewater from the casino and resort and generates biosolids which are disposed of on farmlands in the region.

CTCLUSI currently does not have Tribal regulations related to waste management. In 2013, the Tribes prepared a Solid Waste Management Plan. This document serves as an update to that plan and reflects changes in land base, areas served, updated goals and objectives, and current waste management options and costs.

The City of Coos Bay collects and disposes of wood waste and construction and demolition debris for a fee. Although the monetary cost of collection and disposal is higher than the cost of burning, using the City's services offers the advantage of reducing or eliminating toxic emissions that threaten the health of people and degrade air quality.

4.4 Residential

The Tribes pays for pickup of garbage and recyclable materials and occasional dump runs for Tribal housing and HUD residences. As needed, the Tribes assist Tribal members to cover the costs of garbage collection, handling, and disposal. The following information was provided by the CTCLUSI Controller based on payment records from 2021 through 2023.

- Qa'aich in Florence has a garbage dumpster that is shared by the entire complex. It is picked up weekly, and the cost of pickup and disposal is $230 per month. Recycling service is not provided to Qa'aich.

- At Qaxas Heights, each house has its own waste collection bin. North Bend Sanitation picks up the waste bins for disposal, and the cost is approximately $1,000 per month. Bin sizes vary based on the size of each household, and pricing for pickup depends on the size of the bins. Recycling service is not provided to Qaxas Heights.

- CTCLUSI pays approximately $35 per month to Les Sanitary for waste pickup from Tribal housing at 1370 Neese in Coos Bay.

- At the HUD housing areas in Coos Bay (Clay Street, Harriet Street, and Flanagan Street), each house has its own waste bin and the Tribes pay Les Sanitary approximately $230 per month for the four residences. The cost has varied over time. Most of the time, it has been in the range of $50 per month per house; however, there have been significant outliers: 909 Flanagan Street has several monthly bills that were over $600.[3] The Tribes paid for two dump runs for the HUD housing in 2021 but has not received recent billings for dump runs (Coos County Solid waste bill).

The Tribes have paid approximately $1,000 to Les Sanitary over the past several years to assist Tribal members to cover disposal costs.[4]

Average monthly costs for each housing area are summarized below:

Residential Area	Cost per Month	Number of Residents	Monthly Cost per Person	Services
Qa'aich	$230	11	$ 20.91	Trash only
Qaxas	$1,000	65	$ 15.38	Trash and recycling
Neese	$35	4[5]	$ 8.75	Trash and recycling
HUD	$230	18	$ 12.78	Trash and recycling

Qa'aich has the highest per person cost, and this cost is for garbage pick and disposal only. The costs shown in this table do not include occasional dump runs, only the costs for regular pickup and disposal services.

For Tribal members living in private housing, waste management practices depend on their location and county waste management services provided in that area, as described in Section

[3] These abnormally high bills are probably due to tenant changeover and associated high disposal costs for removing bulky items, such as furniture and appliances. Cost savings could be realized in future if these bulky items could be donated for reuse. Section 6 of this document provides further discussion on waste management options.

[4] The Tribes could evaluate these costs with respect to alternatives for disposal that would meet similar needs in the future.

[5] Number of residents at Neese housing is estimated 4 residents for this single-family home.

4.2. Most Tribal members live in cities where residential collection services are provided for garbage and recyclable materials; however, regular pickup services for yard waste and food waste for composting are not provided.

4.5 Tribal Facilities

4.5.1 Coos Bay and Florence Tribal Administrative Offices

The administrative offices dispose of paper waste using a shredding service: I Secure picks up the waste on an as needed basis. The average cost during 2021 – 2023 was $100 per month.

Solid waste from the administrative offices is picked up by Les Sanitary. The average cost during 2021-2023 was $688 per month. Monthly billings for this service include separate invoices for multiple locations: Fulton, Wallace, and Coos Head. (Les Sanitary, code 150-1080).

Dump runs from the administrative offices to a disposal facility occur as needed. The average monthly cost for dump runs is $30 (Coos County Solid Waste, code 150-1050).

For the unoccupied house at Coos Head, CTCLUSI pays approximately $95 per month to Charles Sanitary.

Food waste from the kitchen in the community center is composted in the community garden.

The Facilities Maintenance Department has a burn pile near the Coos Bay administrative buildings to dispose of wood waste and wood debris. Some of the discarded wood can be used for firewood, landscaping, and other purposes; however, these alternatives to burning and landfill disposal are currently limited. The maintenance crew collects debris from land clearing, building demolition, and construction and, when a sizeable amount has accumulated, they burn this material.

4.5.2 Laboratory

The laboratory disposes of trash and recyclable materials by combining its waste stream with waste from the administrative offices. The waste stream from the lab is predominately cardboard, plastic, and Styrofoam. For chemical and biohazard waste, the laboratory is currently evaluating options for collection, handling, and disposal. Laboratory analyses include conventional chemistry, microscopy, bacteria, metals, organics, environmental DNA, and radiocarbon. These analyses generate the following types of wastes: non-hazardous aqueous waste that might require analysis prior to disposal, corrosives (strong acids and bases),

potentially high concentrations of metals in aqueous solution, flammable and non-flammable solvents, biohazards, and sharps from injections. Solid waste generation quantities are estimated at 2.3 tons per year. A small amount of hazardous waste is anticipated initially. As the laboratory ramps up operations, the quantity is expected to increase to a small-quantity-generator level (400 pounds per month or 2.4 tons per year). Separate on-site storage will be required for specific classes of chemicals, like strong acids and bases. Laboratory waste management information is included in Appendix D.

4.5.3 Dental Clinic

The dental clinic currently contracts with Stericycle for pickup and disposal of special waste. Data on current generation quantities and costs of collection, handling, and disposal are not available at this time. This information can be added to this ISWMP when it is available.

4.6 Tribal Enterprises

Used items from the casino such as bedding and furniture are given to the Tribal administration to make available to Tribal members and staff for free (CTCLUSI, 2013). This reduces the cost to the casino of disposing of these items as waste, and benefits users.

Other than composting the landscaping plant clippings, the casinos do not separate materials from the solid waste stream for recycling and composting. All solid waste, including food waste from the kitchens and restaurants, is collected, handled, and transported for landfill disposal.

Field observations at the RV resort noted containers for garbage but no recycling bins.

5.0 PROJECTED FUTURE WASTE GENERATION

This section estimates future waste quantities and generation rates for each service area based on projected population growth during the next 10 years. Key variables related to this projection are expected population changes in the service area and the expansion of Tribal facilities, services, and enterprises.

5.1 Residential

The population in the Five-County Area of Oregon is relatively stable. The population in some towns and cities, such as Florence, is growing. Population in other cities, such as Coos Bay, is decreasing.

Since 2013, CTCLUSI enrollment has increased from 1,051 to 1,331 people—an increase of about 25 percent. The enrollment includes members living in other counties and states. Based on data available, it is not known whether growth was primarily among local residents or among members living remotely; however, it's reasonable to assume that growth was relatively consistent among the counties. If this trend continues, the population would be expected to increase by a similar percentage over the next 10 years. If per capita waste generation rates remain close to current rates, CTCLUSI should expect its total residential waste generation and associated disposal costs to increase by 25 percent in 10 years. The per capita waste generation rates and the disposal costs could increase as well, compounding the effect of this increase. If concerted efforts are made to reduce waste generation and develop cost effective disposal options, the increases could be reduced. Table 5 summarizes estimated increases in residential waste generation over the next 10 years.

Based on communications with the Tribes' Planning Department, the Tribes plan to add single family units to its Tribal Housing supply at a rate of approximately two to four units per year.

5.2 Tribal Facilities

The Tribes are planning to open a medical clinic during 2024. A dental clinic began operating in 2023. These facilities will generate biohazards and sharps that will require special handling and disposal. Similarly, the laboratory will begin generating chemical and biohazard waste that requires special handling and disposal. The laboratory is currently evaluating options to determine the most appropriate and cost-effective methods of handling and disposal of these special wastes. Indian Health Service (IHS) and Bureau of Indian Affairs (BIA) may provide funding for solid waste management at the clinics.

The estimated solid waste generation rate for the dental clinic and medical clinic is approximately 8.76 tons of waste per year. The laboratory will generate approximately 2.3 tons of solid waste per year and approximately 2.4 tons of special waste (including hazardous waste) per year. This special waste will require specialized management, handling, and disposal.

5.3 Tribal Enterprises

Table 6 summarizes the projections of increased waste generation due to enterprise expansion.

5.3.1 Florence Casino RV Parking Expansion

The Florence casino plans to add 50 to 60 RV parking spaces to its existing RV parking area during the next 2 to 3 years. This would more than double the size of the RV park and potentially add 44 tons of solid waste per year.

5.3.2 Coos Head Development

The U.S. Navy transferred a large portion of the former Coos Head Air National Guard property to the Tribes. The property that was acquired by the Tribes includes derelict buildings and potential contamination that are legacies of former U.S. Navy facilities and operations. The Tribes intends to develop the property for new facilities including a cultural center and RV park. A Coos Head Area Master Plan (CHAMP) has been developed that establishes a development plan for Coos Head. The CHAMP includes an interpretive center, conference center and hotel, and Tribal center. It also considers developing 20 to 30 spaces for RVs and tent camping. The CHAMP does not, however, include planning to address remaining environmental concerns, such as the derelict buildings and residual contamination, and waste management (CTCLUSI, 2018). The planned development could add approximately 80 tons per year to the current solid waste stream.

5.3.3 Hanisiich Village

A project to develop a waterfront property in Coos Bay as a cultural center and vacation lodging was proposed, but there are currently no plans to develop the site.

6.0 WASTE MANAGEMENT OPTIONS AND OPPORTUNITIES FOR IMPROVEMENT

The U.S. Environmental Protection Agency (USEPA) developed the non-hazardous materials and waste management hierarchy, recognizing that no single waste management approach is suitable for managing all materials and waste streams in all circumstances (USEPA, 2023). The hierarchy ranks the various management strategies from most to least environmentally preferred. The hierarchy places emphasis on reducing, reusing, and recycling as key to sustainable materials management.

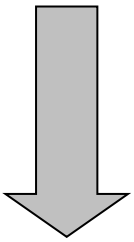
Source Reduction *Most efficient, least wasted economic value, least ecological impacts*

Reuse

Recycling

Composting

Incineration



Land Disposal *Least efficient, most wasted economic value, most ecological impacts*

Each waste management strategy is described below, followed by methods that CTCLUSI may employ to promote use of the optimal strategies.

6.1 Source Reduction

Source reduction should be given first consideration because it conserves natural resources, reduces pollution, and promotes conservation and pollution prevention. Source reduction involves informing the public on methods and strategies to reduce the amount of materials that must be handled as waste. In 1989, the USEPA gave source reduction the highest priority as a method for addressing solid waste issues. Source reduction offers cost savings by avoiding the expenses associated with waste collection, transportation, and disposal.

Successful source reduction methods include regulations and educational programs directed toward changing habits, and usually involve minimal capital costs (or even capital savings) and low operating and maintenance costs. For example, some communities ban certain non-recyclable products and excess packaging, such as Oregon's ban of single-use plastic bags in 2020 (https://www.oregon.gov/deq/mm/production/pages/bags.aspx).

6.2 Reuse

The second option in USEPA's hierarchy is reuse. Reuse is a better option than recycling because the items are not reprocessed before becoming useful again. Items such as appliances, furniture, clothing, books, toys, paint, lumber, and household cleaners can be exchanged among households and businesses rather than thrown away. Resources recovered from reuse can also support local community and social programs while reducing disposal fees.

6.3 Recycling

Recycling is the process whereby materials that are normally disposed of are collected, reprocessed, or remanufactured for reuse. This reduces use of materials to manufacture new products and reduces the volume of waste requiring disposal. Recycling relies on the public to participate by separating materials selected for recycling from the waste stream before disposal. Recycling programs must be designed with public convenience and support as a primary objective. The two greatest challenges to developing a successful recycling program are public participation and contamination of recyclable materials.

Participation by a majority of Tribal members provides the volume of recyclable materials necessary to make the program cost-effective and creates peer pressure on other Tribal members to recycle. Participation is often greater when steps are taken to make it easy. Users will be less likely to recycle if they must sort materials into four different bins, and then haul it to a central facility. Effective public outreach and educational programs can also encourage participation.

Contamination occurs when an unacceptable item is placed into a recycling container. Contamination hinders and sometimes ruins otherwise good recyclables, increases cost, and sends recyclable materials to the landfill. If the materials (particularly paper) are contaminated and do not meet quality guidelines, they will be rejected and sent to the landfill or incinerator.

Recycling services vary by location. Residential pickup of recyclables generally encourages higher participation rates than requiring residents to bring their recyclables to a central drop-off point. However, Ridolfi observed some recycling services in the CTCLUSI service area provided uncovered plastic containers for residential recycling bins. In a rainy climate like Oregon’s, this can lead to contamination and destruction of recyclable materials, especially paper and cardboard.

6.4 Composting

Composting is an environmentally sound and beneficial means of recycling organic matter. Composting is the biological decomposition of organic materials to produce a humus-like product that can be used as a soil amendment. Depending on the sources of materials and the availability of siting and labor, composting can be done on a scale of operation ranging from micro (household) to macro (fish waste composting). "Browns" (carbon sources such as hay, manure, biosolids, dry vegetation, newspaper, and non-recyclable paper) are layered or mixed with "greens" (nitrogen sources such as fresh grass clippings, uncooked vegetables, and fruit wastes) to promote decomposition. The ideal carbon to nitrogen (browns to greens) ratio is 30 to 1 by volume. Efficient composting is possible at ratios as low as 15 to 1; however, odor problems are more likely at this lower ratio. Typical carbon to nitrogen ratios (C:N) in common organic materials are presented below:

Leaves	60:1	Fruit Wastes	35:1
Grass Clipping	19:1	Paper	170:1
Food Wastes	15:1	Sawdust	500:1
Fish Waste	5:1	Wood	700:1
Cow Manure	20:1	Cardboard	560:1

It is important that temperature and aeration are monitored during composting. Properly aerated compost should range from 105 to 150 degrees Fahrenheit (degrees F) for composting to be effective. Temperatures above 170 degrees F can create an opportunity for spontaneous combustion. Aeration involves turning the pile either manually or mechanically with equipment such as a backhoe or windrow turner. Aerobic decay, which takes place with oxygen present, is the preferred biological process. Anaerobic decay takes place without oxygen and is prone to odor problems. Aerobic decomposition can be tracked by monitoring the internal temperature of the compost pile. When the temperature drops below 105 degrees F, turning the pile will reestablish oxygenation and heating.

Information and guidance about composting is provided in Appendix C.

6.5 Landfill Disposal

The total generation of municipal solid waste in the United States in 2018 was 292.4 million tons, more than 50% of this was landfilled (USEPA, 2022). Modern landfills are facilities for the disposal of solid waste. They are designed to protect the environment from contaminants that may be present in the waste stream. There are different types of landfills including municipal

solid waste landfills, designed for household waste and other nonhazardous waste; industrial waste landfills, designed for commercial and institutional waste; and hazardous waste landfills. Landfills pose several problems. One of the major concerns with landfills is their release of methane gas. As organic matter in landfills decomposes it releases methane gas. Methane is one of the most potent greenhouse gases and a huge contributor to climate change. Landfills also take up large amounts of space, typically destroying natural habitats for wildlife. Landfills are required to have linings to protect the underlying ground, but these can leak, producing leachate. This leachate can contaminate nearby water sources and habitats. Landfills are a societal necessity but utilizing other waste management practices can reduce reliance on landfills and thus their environmental and societal impact.

6.6 Incineration

Incineration is widely used to reduce the volume of municipal solid waste, medical waste, and hazardous waste, and to reduce the potential toxicity of medical and hazardous waste. Incineration is a waste treatment process that involves the combustion of substances contained in waste materials. In 2018, about 12% (35 million tons) of municipal solid waste was combusted nationwide (USEPA, 2022). Incineration facilities are commonly referred to as waste-to-energy facilities. Waste-to-energy facilities work by releasing heat through the burning of waste that turns water into steam in a boiler. The high-pressure steam turns the blades of a turbine generator to produce electricity. The primary products of waste incineration are carbon dioxide, water vapor, ash byproducts, and trace organic and inorganic compounds in the exhaust gases. A major concern of incineration processes is the potential risk to human health from the emission of pollutants generated by the incineration process. The composition of these residues is determined by the waste steam, combustion process, and reaction occurring in waste gases. Emissions from incineration facilities can be reduced by choosing advanced combustion designs and emission-control technologies for the pollutant of concern (NRC, 2000). The ash that is produced as a byproduct from the combustion process is commonly disposed of in landfills. Alternative reuse methods for the ash are being assessed by researchers.

6.7 Backyard Burning

Backyard burning involves the burning of household waste, wood, and yard debris. Household waste includes paper, cardboard, food scraps, and plastics. Burning usually occurs in a burn barrel or open pit. Air emissions from burning are released directly into the atmosphere without filtering or treatment to reduce harmful particulates, toxic vapors, and fumes in these emissions. Backyard burning is a recognized health hazard that produces harmful quantities of dioxins, a group of highly toxic chemicals, and other harmful chemicals. Burning waste can cause long-

term health problems including increasing the risk of heart disease, aggravating respiratory ailments, and causing rashes, nausea, and headaches. Backyard burning should be avoided and other waste management options should be used. Outreach and education on hazards and alternatives to burning waste are important in discouraging this practice.

6.8 Hazardous Waste Management

Specific categories of waste require special management due to their hazardous nature. This includes highly flammable materials such as batteries. Recently, an Oregon landfill had a fire – the cause is unknown but was suspected to be started by a lithium battery. Lithium batteries should not be disposed in the trash because of their flammability hazard.

https://www.bakercityherald.com/news/local/fire-smothered-at-baker-sanitary-service-landfill/article_7166a36c-66cb-11ee-84c7-336d083f1d84.html

https://roguedisposal.com/resources/education/environment/standing-the-benefits-and-dangers-of-lithium-batteries

The counties offer occasional free collection services for household hazardous waste drop off at transfer stations. For example, Beaver Hill Transfer Site (Coos County) held such an event on September 16, 2023. Batteries used at home and in offices should not be disposed of with garbage. Batteries should be disposed of as household hazardous waste. Establishing battery collection events for Tribal members would encourage proper disposal of batteries.

7.0 PUBLIC OUTREACH AND EDUCATION

7.1 Goals and Objectives

Goals for outreach and education include:

1. Make Tribal members and staff aware of the waste management options that are available (recycling, composting, source reduction, reuse)

2. Make Tribal members and staff aware of the benefits of recycling, composting, and source reduction and reuse (cost savings, reduced impacts on natural resources).

3. Reduce the volume of waste generated by the Tribes that is being landfilled or burned. Reductions may be achieved through source reduction, recycling, composting, or a combination of methods.

7.2 Outreach Methods

Consider the media and events listed below as possible outreach tools:

- Solid Waste Advisory Committee (SWAC)
- Exchange Center or Bulletin Board (Physical or Digital)
- Flyers and posters with Tribal artwork and culturally appropriate messaging placed in community locations such as Tribal housing, community centers, health centers, and schools
- Social media and websites
- Collection Events
- Outreach and Education with Youth Groups
- Recycling 101 Pamphlet
- Staff Workshops
- Tribal artwork on containers to encourage recycling and proper garbage collection
- Newspapers and newsletters

- Public Information Booths

7.3 Measuring Effectiveness

Surveys can be conducted to assess current baseline awareness of waste management options and benefits, and repeated after outreach has been conducted to assess the effectiveness of the outreach in reaching the target audience and communicating the intended message. Effectiveness in reducing waste volumes landfilled may be measured by tracking disposal costs.

8.0 IMPLEMENTATION

8.1 Roles and Responsibilities of Tribal Personnel

Responsibilities associated with implementing and administering the ISWMP include planning, development, contracting, record keeping, staffing, and public outreach. The Tribes could designate a solid waste manager or coordinator who would have the responsibility and authority to implement a strategic implementation plan and lead the Tribes' efforts and initiatives aimed at improving solid waste management for the Tribes. Since all departments generate solid waste and are involved in solid waste management, periodic meetings and coordination would be helpful to implement this ISWMP and facilitate continuous improvement in solid waste management.

8.2 Strategic Implementation Plan

A Strategic Implementation Plan is provided in Appendix F to guide and support the Tribes' accomplishment of solid waste management goals and objectives. The purpose of the Strategic Implementation Plan is to provide a relatively simple and useful roadmap that will guide the Tribes during the next five years (2024 – 2028).

A strategic plan is designed to answer three basic questions:

(1) Where are we now?
(2) Where do want to go?
(3) How do we get there?

The ISWMP contains the information needed to answer the first question. The Strategic Implementation Plan provides the structure, framework, and guidance for the Tribes to answer the second and third questions.

8.3 Resources and Funding Sources

Various resources and funding sources to support the Tribes' solid waste management program from EPA, County, State, and private sector sources are provided in Appendix G.

8.4 Recommendations for Waste Reduction and Diversion

8.4.1 Source Reduction

8.4.1.1 Residential Source Reduction Methods

As shown in Section 3.1, edible[6] food waste is the largest category of residential waste, at nearly 14 percent, which translates to roughly one pound per person per day of edible food waste. Planning meals to use leftover food quickly before it spoils, and planning grocery shopping to only buy what is needed could decrease the amount of waste. Storage to avoid spoilage can reduce the amount of food wasted: EPA has tips on food storage, such as freezing food that will not be consumed before it goes bad, delaying washing fresh produce until just before eating (damp foods spoil faster), and keeping food in airtight containers in the refrigerator. https://www.epa.gov/sustainable-management-food

Diapers are a large category of residential waste (9%). Typical disposable diapers contain plastic and take a long time to break down in a landfill. Alternatives to disposable diapers include cloth diapers (though they require water and energy use for cleaning) and compostable diapers, which work like typical disposable diapers, but are made of bamboo fiber and do not contain plastic, thus can decompose faster in a landfill, or can be sent to a commercial composting facility. The downside to compostable diapers is that they are commonly more expensive than typical plastic disposable diapers, and are not as widely available.
Additional methods to reduce waste include:

- Purchase household items in bulk to reduce packaging waste.
- Purchase items with minimal packaging; reduce mail order purchasing where possible to avoid excess packaging waste.
- Call direct mailers to remove your name from their mailing lists.
- Rent or borrow items that are only used occasionally or obtain used items when appropriate.

8.4.1.2 Government and Facilities Source Reduction Methods

For tribal administration and offices, the following actions can be taken to reduce waste:

[6] The definition of "edible" food includes food that is spoiled or contaminated (no longer safe to eat) but was intended for eating. "Non-edible food" is scraps such as peels, shells, cores, husks, and bones, associated with food but not intended for eating. The non-edible portion of the food waste is difficult to address via source reduction but is discussed in the composting section below.

- Minimize the number of documents that are printed – use electronic versions when possible.
- Establish a double-sided copying policy. Set all printers to print double sided automatically.
- Print only the number of copies necessary.
- Circulate documents and memoranda rather than making multiple copies.
- Use electronic media for document and data archival rather than paper.
- Use central bulletin boards and e-mail for broadcast communications.
- Work with suppliers to minimize the amount of packaging used. Establishing this priority in CTCLUSI management and procurement policies could facilitate discussions with suppliers.
- Return shipping materials such as crates, cartons, and pallets for reuse; alternatively, save the packaging and reuse it for outgoing shipments.
- Promote the purchase of items in bulk to reduce packaging.
- Purchase durable equipment and supplies. High-quality, long-lasting supplies and equipment can be repaired and result in fewer discards. These items will stay out of the waste stream longer, and the higher initial costs are often offset by lower maintenance and disposal costs.
- Reuse products and supplies; for example: use reusable office supplies such as refillable pencils and rechargeable printer cartridges; encourage employees to reuse common items such as file folders, interoffice envelopes, and report binders; and use ceramic mugs rather than disposable cups.
- Rent equipment for limited or short-term uses.
- Promote the use of less hazardous cleaning products that perform well and are safer for human health and the environment. This reduces the amount of hazardous waste that will need to be managed.

8.4.1.3 Source Reduction Methods for Enterprises

The source reduction methods recommended for Government and Facilities also apply to enterprises. Tips for waste reduction in hotels and casinos is included in Appendix A. Information on compostable food ware is included in Appendix B.

8.4.2 Reuse

8.4.2.1 Residential Reuse

Reusing goods within a household and sharing goods for reuse in a broader community are both important ways to increase reuse and decrease waste generation. To promote reusing goods within a household, the Tribes could sponsor or facilitate classes on repair and maintenance to help members fix items in need of mending or promote to its members classes given by others. King County in Washington has a similar program:

https://kingcounty.gov/en/legacy/depts/dnrp/solid-waste/programs/ecoconsumer/repair-events)

Also, community colleges offer classes in home repair and maintenance. To facilitate sharing goods for reuse among households, there are several organizations that allow people to offer or request items for free through online bulletin boards and social networks, such as Buy Nothing and Freecycle groups. In addition, Craigslist and other online marketplaces facilitate selling and buying used items. Many types of goods can be reused, such as furniture, appliances, clothes, sports equipment, etc. This can be particularly applicable for children's items that are outgrown quickly before being worn out; or for people who rent or move frequently and need to replace belongings.

The Tribes could encourage members to use one of these existing platforms to give and request items, to avoid the need to create a new website or system. Local Freecycle groups already exist for Florence and Coos County. Buy Nothing groups exist for Coos Bay and Florence. Or, if Tribal members would be especially interested in sharing within the Tribal community, they could create their own groups within these platforms or on a separate online or print platform such as the Tribal website or newsletter. This requires someone to act as the group moderator/administrator.

The Tribes could also provide an in-person location for giving/receiving used items, such as a thrift store. This requires volunteers or staff to manage donations and requires a publicly accessible location to store and organize the used items. An easier approach might be to start with items that do not require indoor storage, such as construction materials, lumber, and working appliances.

Dirt and rocks are a large portion of residential waste and might be able to be diverted from garbage for reuse in building projects.

8.4.2.2 Reuse for Facilities

Similar to residential reuse, Tribal facilities can promote reuse both within a department and across departments. For example, an inventory of available equipment could reduce unnecessary purchases by ensuring that multiple departments don't buy redundant equipment that is already available in storage. This could include generic office equipment such as desks and chairs, and specialized equipment for the dental and medical offices and laboratory.

Additionally, the Tribes could establish a preference for purchasing reused/refurbished equipment when appropriate. For example, when purchasing IT equipment such as computers and smartphones, there can be significant cost savings as well as a reduction in natural resources consumption when buying refurbished models.

8.4.2.3 Reuse Methods for Enterprises

Used items from the casino such as bedding and furniture are given to the Tribal administration to make available to Tribal members and staff for free (CTCLUSI, 2013). This reduces the cost to the casino of disposing of these items as waste, and benefits users.

Uncontaminated and unspoiled excess food from the restaurants at the casinos could be donated to food banks; this would require transportation and safe handling. Food waste that is not fit for human consumption (for example, table scraps that are left on patrons' plates in the restaurant, and food scraps such as vegetable peels from the restaurant kitchen) could be fed to animals. The Chumash Casino Resort managed by the Chumash Indians received an EPA recognition for diverting food waste from landfills, including feeding food scraps to animals https://www.epa.gov/archive/epa/newsreleases/epa-recognizes-santa-ynez-band-chumash-indians-achievements-zero-waste-and-food.html

Restaurant kitchen grease (such as frying oils) can be recycled into biodiesel.

The enterprises could also follow the recommendations for government/facilities regarding reuse of office furniture and equipment, and purchase preferences for refurbished items.

8.4.3 Recycling

8.4.3.1 Residential Recycling

At the Qa'aich Development, recycling services are not provided: a dumpster for garbage is the only option for waste disposal. Adding a second dumpster to collect recyclables separately could reduce the quantity of waste in the garbage dumpster. Dumpsters specifically designed for recycling with designated openings for each type of recyclable material can help reduce contamination of recyclable materials.

Most other residences where tribal members live have recycling options. As shown in Section 3.1, about 16% of residential waste is curbside recyclables, and should be targeted for recycling. There is no current data on what percent of recyclable materials are already being recycled. The 16% reported by ODEQ may include recyclable materials that are thrown in the trash as well as those that are recycled.

Many of the curbside recycling containers that are currently being used are too small to contain and cover the amount of cardboard and other discarded recyclable materials that are being generated. These containers do not have lids to keep cardboard and paper dry. If cardboard and paper are not contained in an enclosed bin between pickups, these materials often get wet. Wet cardboard and paper cannot be recycled and will be disposed of as garbage. Obtaining larger recycling containers with hinged lids that will store large amounts of recyclable materials and keep those materials dry will increase recycling and divert more cardboard and paper out of the waste stream. Grant funding from the USEPA Solid Waste Infrastructure for Recycling (SWIFR) is probably available to support purchase of recycling equipment.

Currently the recycling capability varies by county; ODEQ is planning to harmonize it statewide.

8.4.3.2 Facilities Recycling

As described in Section 4.5, the administrative offices use I-Secure shredding to dispose of paper. It is not known whether this method is used for all paper or only for sensitive documents. For routine paper disposal, other paper recycling options are probably less costly.

Aluminum cans and glass bottles are eligible for refunds when delivered for recycling under Oregon law. Currently the government facilities are collecting aluminum cans and glass bottles but need a designated person responsible for bringing these to a drop off point and collecting

the deposit. This could reduce the Tribes' monthly pickup costs from Les Sanitary and could also provide revenue.

8.4.3.3 Enterprise Recycling

EPA suggests that recycling should be available throughout casinos and hotel rooms to provide staff and guests the opportunity to divert waste from the landfill. https://www.epa.gov/green-building-tools-tribes/greening-tribal-casinos

8.4.4 Composting

8.4.4.1 Residential Composting

The Tribes can encourage the community to develop household compost bins and worm bins for kitchen food waste. The Tribes could provide home composting bins and information for interested members. Collection dates for compostable materials could be communicated to Tribal members, and these materials could be used to make compose for the community garden.

For materials that cannot be readily composted, like tree branches and brush, yard waste disposal is available at some of the county transfer stations.

Some of the paper waste that is not recyclable may be compostable: for example, Seattle accepts pizza boxes for compost/yard waste pickup. Pizza grease contamination on the cardboard makes it ineligible for recycling, but the cardboard can break down relatively quickly in a compost pile.

8.4.4.2 Facilities and Enterprises Composting

The Community Garden has composting bins and capacity to handle more food waste, and could partner with the casino or Tribal Center kitchen. Landscaping waste from the golf course and casino could potentially be used for composting at the community garden; however, the volumes generated might be more than the Community Garden can handle.

8.5 Cost Savings Opportunities from Waste Diversion and Reduction

Table 7 provides estimates of potential cost savings opportunities assuming various levels of waste diversion and reduction. Depending on the percentage of waste that is already being

recycled and composted, the Tribes may be able to reduce disposal costs for certain waste streams by 30% to 90%.

Summary Avoided Costs		Potential Diversion Rates			
		30%	50%	70%	90%
	Residential	$ 3,152	$ 5,253	$ 7,354	$ 9,456
	Facilities	$ 2,128	$ 3,546	$ 4,965	$ 6,383
	Enterprises	$ 18,069	$ 30,114	$ 42,160	$ 54,206
Total Avoided Costs/Year		**$ 23,348**	**$ 38,914**	**$ 54,479**	**$ 70,045**

The total avoided costs shown in Table 7 apply to all 499 Tribal residents in the Five-County Area, not only those living in Tribal housing for whom the Tribes pays directly for waste disposal. Approximately 20 percent of these residents live in Tribal housing; therefore, the Tribes would realize about 20 percent of the residential cost savings.

As shown in Table 7, the Enterprises generate most of the Tribes' solid waste and therefore offer the largest opportunity for waste reduction and cost savings.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The best opportunities for waste reduction and associated cost savings are probably within Tribal enterprises due to the volume of solid waste generated by these operations. Composting or recycling a fraction of the waste generated at the casinos and golf course could significantly reduce the Tribes' costs and adverse effects on the environment. To pursue these opportunities, the Tribes would need to obtain and evaluate site-specific information including solid waste generated within each category at each enterprise. The site-specific waste stream could then be evaluated with respect to current waste management approaches and options to develop a plan of action for improvement. For example, if disposable plates and utensils are being used, compostable materials are preferable to Styrofoam and plastic. Recycling should be made available, accessible, and easy for restaurant and casino guests, many of whom expect their accommodations to provide recycling. Policies and procedures for purchasing can lead to decisions that promote reuse and source reduction.

The Strategic Implementation Plan included in Appendix F provides a relatively simple and useful roadmap that will guide the Tribes during the next five years (2024 – 2028) as they endeavor to implement initiatives to support the accomplishment of solid waste management goals. Within the Strategic Implementation Plan the following conclusions and recommendations are provided along with a framework and timeline for implementation.

Promoting source reduction (through purchasing decisions) and reuse (through facilitating materials exchanges for used items) are the best ways for residents and Tribal facilities and services to reduce solid waste generation rates, waste disposal costs, and environmental impacts.

Recycling and composting are also beneficial. The method of recycling is important: mixed or uncovered recycling collection is convenient for users but can lead to contamination of the recyclable materials. For example, cardboard and paper in open containers often get wet from rain and cannot be recycled. This recyclable material then becomes garbage and is disposed of in a landfill. The Tribes could promote more successful recycling by working with the solid waste service providers to supply covered bins for recyclable materials. Promoting these waste management strategies and providing education on the hazards of backyard burning could move the Tribes toward their goal of reducing the practice of burning garbage and other debris.

Special waste categories such as medical, dental, and laboratory waste require specialized handling and disposal. The Tribes' laboratory will be handling multiple categories of special

wastes and will need to engage a specialized service provider for proper management of special and hazardous wastes. Efficiencies of scale may be realized by combining the waste from the laboratory and the medical and dental facilities.

The Tribes are encouraged to consider ordinances and regulations to control illegal dumping and enable Tribal police to enforce laws and regulations when violations occur. Deterrent efforts such as landscaping, educational resources, and culturally relevant signage may also discourage illegal dumping.

10.0 REFERENCES

California Department of Resources Recycling and Recovery (CalRecycle). 2006. *Estimated Solid Waste Generation Rates*. Available: https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates. Accessed November 15, 2023.

Cascadia Consulting Group (Cascadia). 2021. *2020-2021 Washington Statewide Waste Characterization Study*. Document reference number Publication 21-07-026. Prepared for State of Washington Department of Ecology. August.

CTCLUSI. 2013. Tribal Integrated Waste Management Plan.

CTCLUSI. 2018. Coos Head Area Master Plan. Accessed at https://ctclusi.org/wp-content/uploads/2020/09/CHAMP-002.pdf on September 22, 2023.

United States Environmental Protection Agency (USEPA). 2022. National Overview: Facts and Figures on Materials, Wastes and Recycling. Accessed at https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials on November 15, 2023.

United States Environmental Protection Agency (USEPA). 2023. Sustainable Materials Management: Non-Hazardous Materials and Waste Management Hierarchy. Accessed at https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy on November 17, 2023.

Good Company, LLC. 2019. Lane County Solid Waste Management Plan. Prepared for Lane County Public Works Waste Management Division. Accessed at https://cdnsm5-hosted.civiclive.com/UserFiles/Servers/Server_3585797/File/Lane_Co_SWMP-2019-07-26-FINAL.pdf on September 21, 2023.

Massachusetts Institute of Technology (MIT). 2023. MIT Climate Portal. Accessed at https://climate.mit.edu/ask-mit/why-do-we-compare-methane-carbon-dioxide-over-100-year-timeframe-are-we-underrating on October 16, 2023.

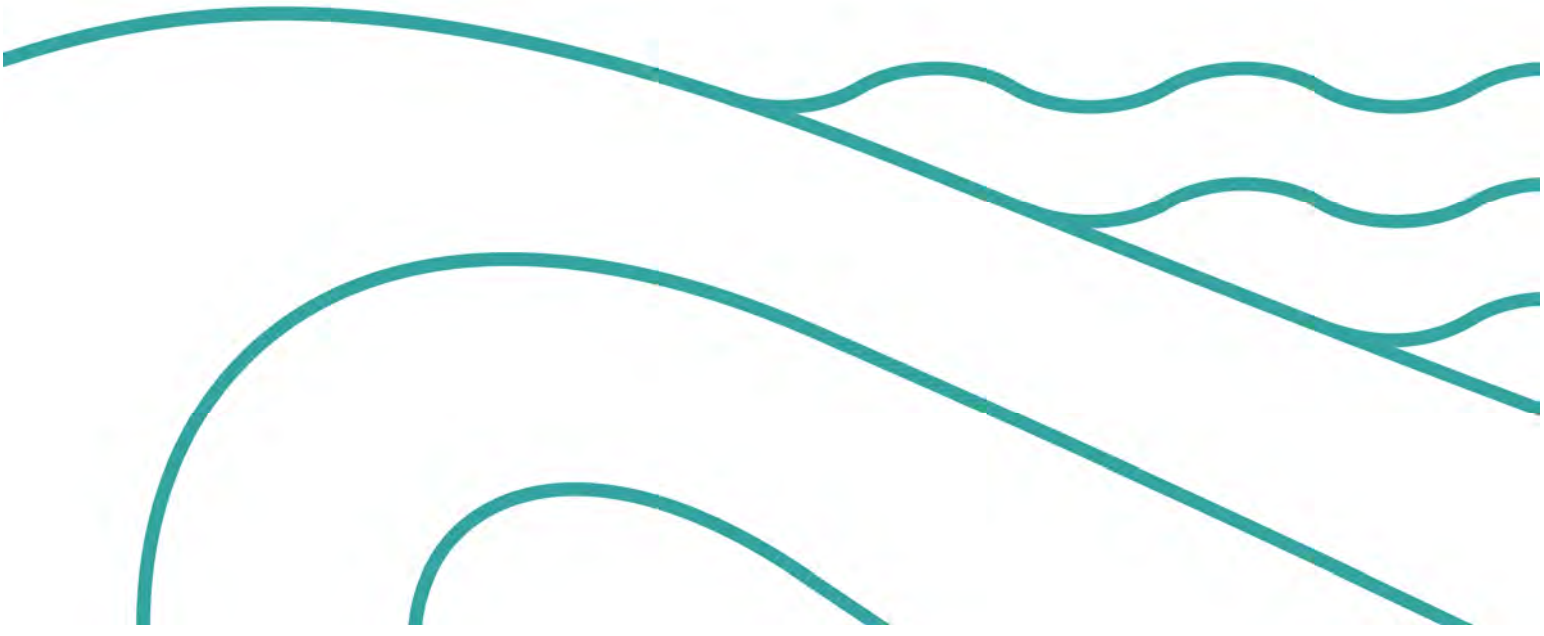
National Research Council (US) Committee on Health Effects of Waste Incineration (NRC). 2000. Waste Incineration & Public Health. Available from: https://www.ncbi.nlm.nih.gov/books/NBK233627/

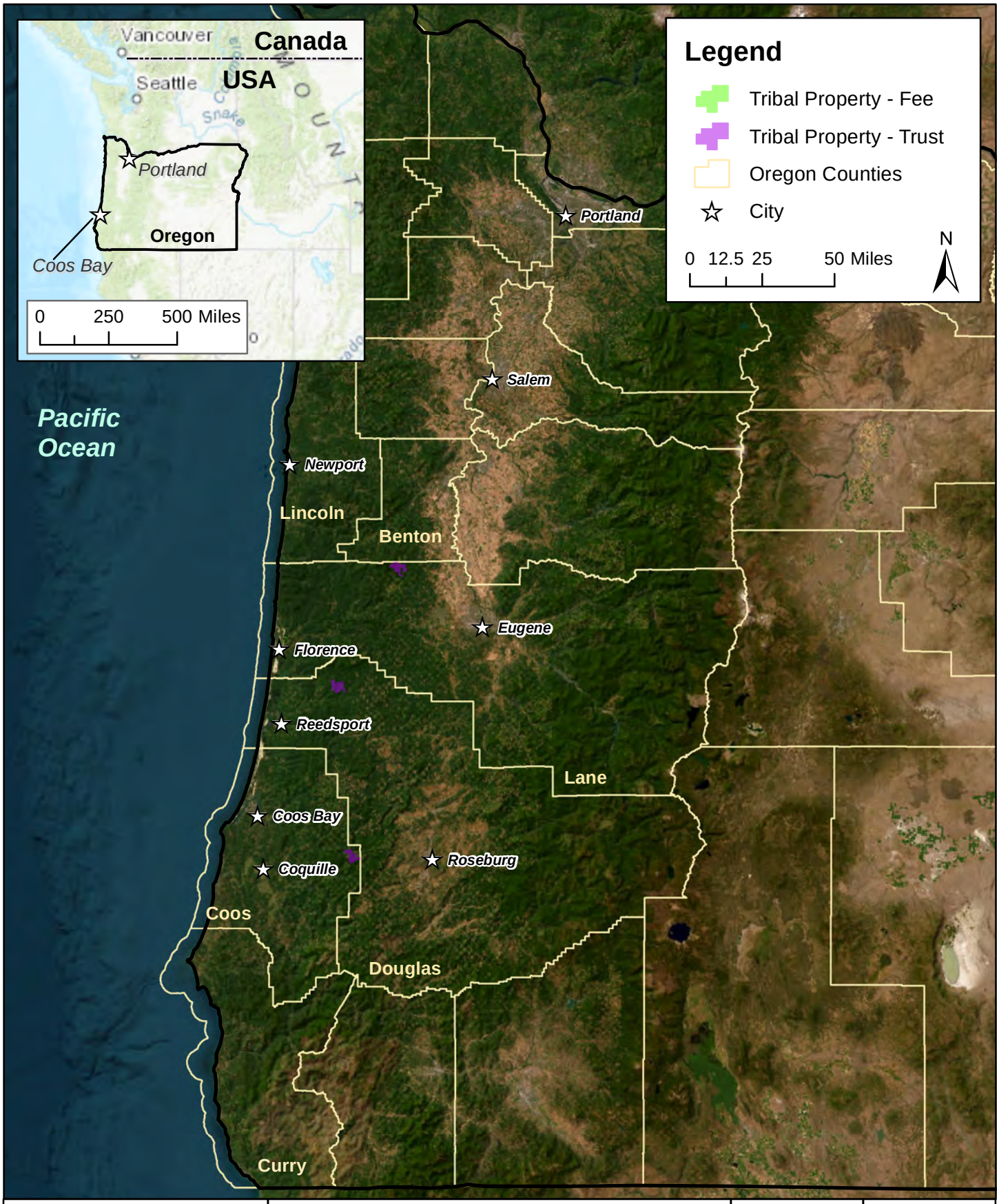
Oregon Department of Environmental Quality (ODEQ). 2017. Small Quantity Hazardous Waste Generator Checklist. Accessed at https://www.oregon.gov/deq/FilterDocs/SQGChecklist.pdf on November 17, 2023.

Oregon Department of Environmental Quality (ODEQ). 2023. 2021 Oregon Material Recovery and Waste Generation Rates Report. Accessed at https://www.oregon.gov/deq/recycling/Documents/2021MRWGRatesReport.pdf on September 22, 2023.

Spangler, Teresa. Director of Guest Services, Three Rivers Casino Resort. Email to Janet Niessner dated October 16, 2024.

Figures





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Integrated Solid Waste Management Plan

Prepared for the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians

November 2024 | Figure 1

Location Map

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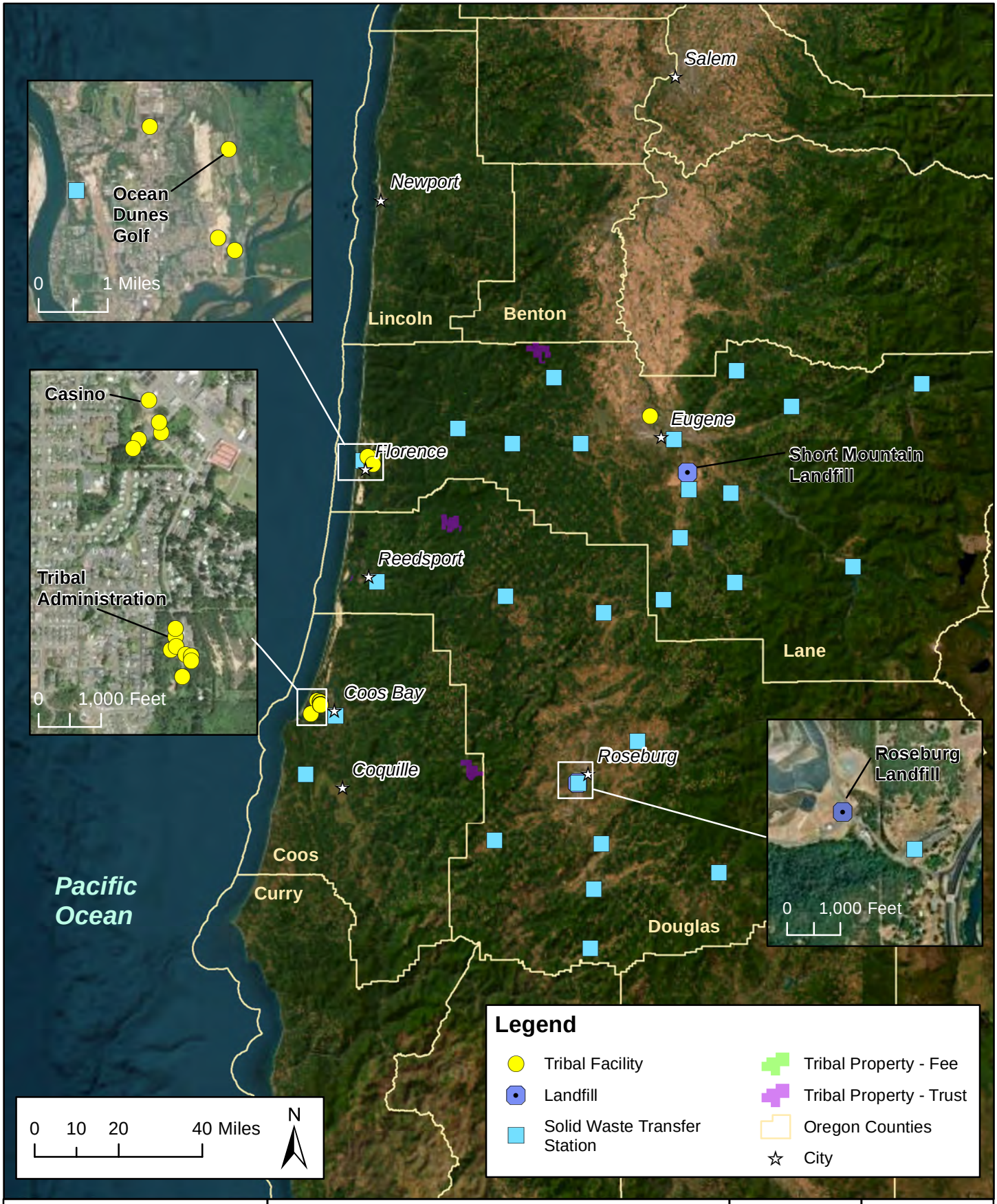

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Integrated Solid Waste Management Plan

Prepared for the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians

November 2024 | Figure 2

Site Features

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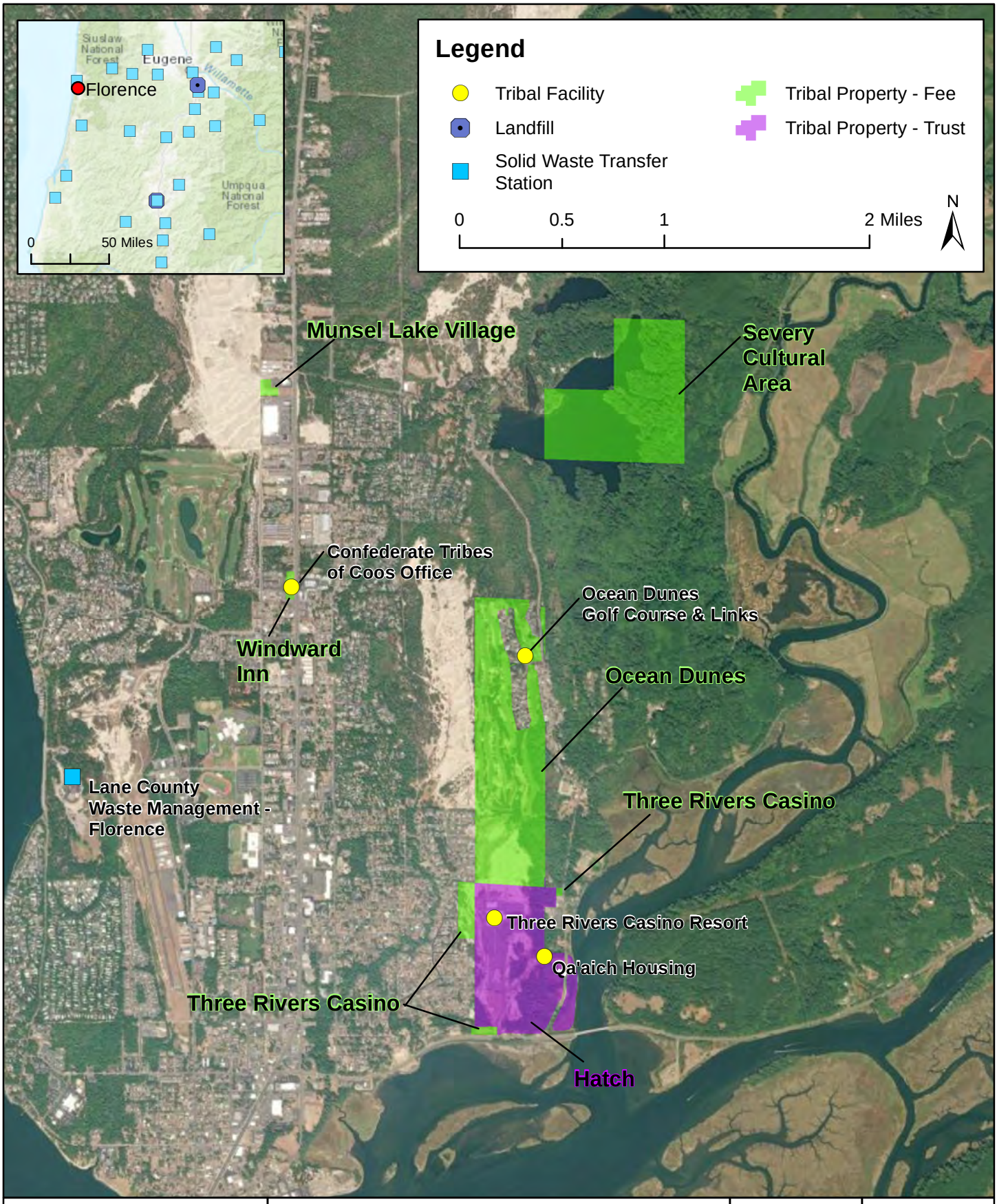

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Integrated Solid Waste Management Plan

Prepared for the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians

November 2024

Figure 3

Tribal Properties and Solid Waste Management Facilities
Florence, Oregon

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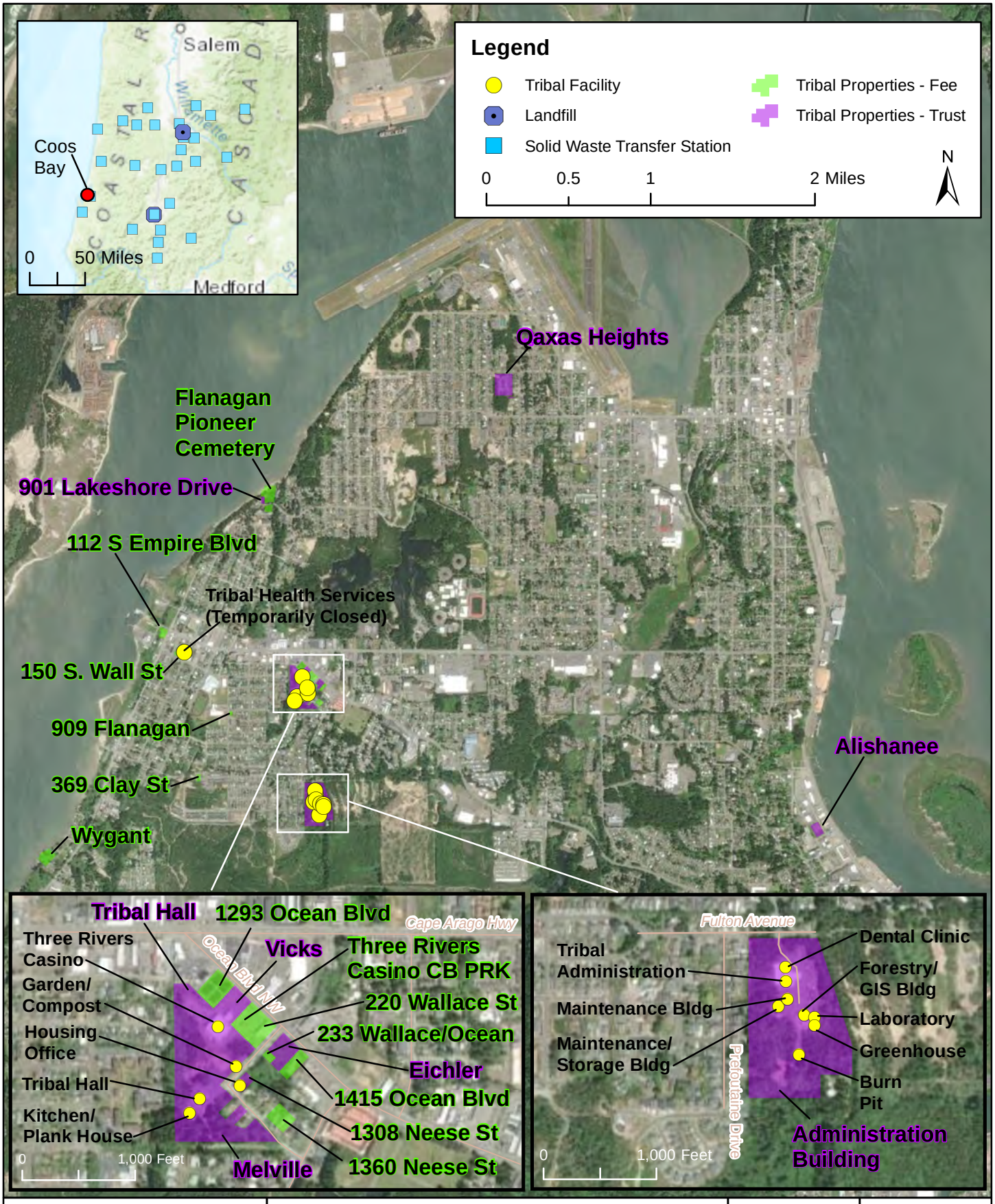

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Integrated Solid Waste Management Plan

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November 2024 | Figure 4

Tribal Properties and Solid Waste Management Facilities
Coos Bay, Oregon

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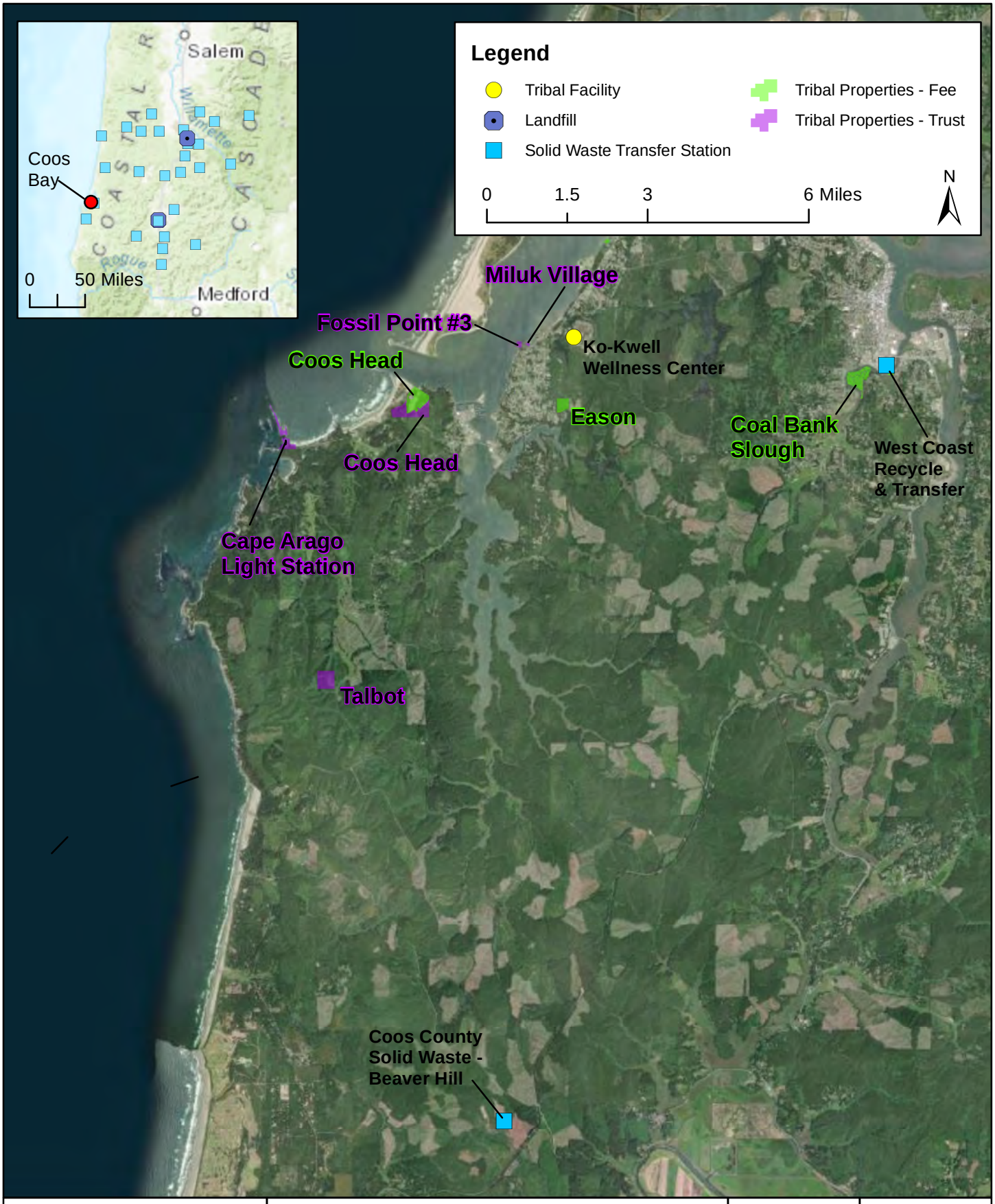

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Integrated Solid Waste Management Plan

Prepared for the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians

November 2024 | Figure 5

Tribal Properties and Solid Waste Management Facilities
Coos Head, Oregon

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Tables



Table 1. Waste Categories Used in the Waste Stream Composition Analysis

Waste Category *	Description
Paper – Recyclable	Newspaper; magazines; packaging paper; egg cartons; phone books; mixed/low-grade recyclable papers (cereal and cracker boxes, notebook paper); high-grade paper (copy machine paper); poly-coated packaging (milk and juice containers, paper soup cartons); low-grade paper (junk mail, envelopes, construction paper, sticky notes)
Cardboard- Recyclable	Cardboard containers and boxes (unless poly-or foil-laminated); brown paper bags; wine boxes
Paper – Non-recyclable	Non-recyclable packaging paper (waxed corrugated cardboard, photos, carbon paper, foil containing wrapping paper, wall paper, foil lined fast food papers, microwave paper food trays, individual cigarette packages, paper with large thick plastic windows, paper containers that held hazardous products, thin bound reports with plastic covers, and non-food poly-coated boxes); compostable non-recyclable paper (tissue, paper towel, napkins, paper plates without plastic lining, molded paper plant pots)
Plastic – Recyclable	Deposit beverage bottles (beer, soft drink, water bottles, wine, milk, infant formula, juice); No-deposit bottles (small beverage, non-beverage food, medicines, vitamins, laundry supplies, hair and bath products); 5-gallon buckets; flower pots; other plastic materials meeting definition of Rigid Plastic Container ; plastic grocery and garbage bags; packaging film plastic (newspaper bags, bread bags, product wrap, zip-close bags, furniture wrap, building wrap, cling wrap, bubble wrap); plastic non-bag film (plastic tarps)
Plastic – Non-recyclable	Other rigid plastic containers that are not acceptable for curbside recycling (cookie trays, flowerpots, clamshell containers); plastic beverage pouches; plastic garbage bags; non-recyclable plastic film (stand-up pouches, plastic strapping)
Yard Debris	Natural vegetative material (grass clippings, leaves/weeds, prunings, stumps)
Wood	Manufactured wooden lumber and other items excluding sawdust (unpainted lumber, clean engineered wood, painted lumber, chemically treated lumber, wood pallets and crates, wood furniture, pencils, coat hangers, mostly wood items combined with other materials)
Edible Food	Edible food includes any food, even if spoiled, that was originally produced to be eaten. Non-packaged bakery goods; packaged bakery goods; non-packaged vegetative; packaged vegetative; non-packaged meat, eggs, dairy; packaged meat, eggs, dairy; mixed unpackaged and packaged foods
Non-Edible Food	Non-packaged vegetative food (contains no animal products, fruit pits, corn husks, carrot tops, coffee grounds); non-packaged animal food-related products (bones, shells, gristle)
Tires and Rubber	Automotive tires and other tires (bicycle tires, off-road vehicle tires, cart tires, shredded automotive tires); other rubber (toys, inner tubes, rubber mats, rubber carpet padding)

Waste Category *	Description
Diapers	Disposable diapers, including fecal materials contained within
Carpet, Textiles, Roofing, Furniture, Insulation	Carpet; rugs; polyurethane foam carpet/rug pads; asphalt shingles and tar roofing paper (recyclable and non-recyclable); mattresses (box springs, futons); furniture and furnishings; paper composite ceiling tires; other miscellaneous organics (hair, soap, dead animals)
Glass	Clear or colored glass containers; plate glass (windows, mirrors); other types of glass products (light bulbs, glassware, glass plates)
Metal - Recyclable	Aluminum (beverage cans, foil, scrap); steel/bimetal beverage cans; tinned cans; non-ferrous metal; food cans; large household appliances; ferrous metal (things made from metal to which a magnet will adhere); items made of mixture of ferrous and non-ferrous metals or items made from a mixture of metal and non-metallic materials
Metal – Non-recyclable	Other aluminum not acceptable curbside (Furniture, house siding, cookware, and scrap); Other non-ferrous not acceptable at curbside (insulated copper wire, pieces longer than 30" or not being pure metal); other ferrous metals not curbside acceptable (household, industrial, and commercial products derived from iron); mixed ferrous/non-ferrous not curbside acceptable (mainly metal items such as electric motors, old lawnmowers, engines); white goods (discarded stoves, washer, dryers, refrigerators and other large household appliances), used oil filters; empty aerosol cans
Electronics/Small Appliances	Computer monitors; computer main central processing units (CPU); printers; computer mice and keyboards; microwaves; TV's; other consumer electronics (DVD, calculators, stereos); non-electronic small appliances (fans, can openers, blenders)
Other Inorganics	Rock, concrete and brick; soil, dirt, sand; pet litter, animal feces; gypsum wallboard; fiberglass insulation; other inorganics (plaster, ash, ceramics, china, and porcelain)
Medical Waste	Syringes, tubing, gauze, blood-containing. Bags and containers with medical waste are not sorted further. Other non-medical waste that is contained with medical waste is sorted as medical waste.
Hazardous and Special Waste	Lead-acid batteries, dry-cell batteries; latex paint, oil-based paints; motor oil; other flammables (thinners, solvents, fuels, hair spray); Pesticides, herbicides, or fungicides; fertilizers; corrosive cleaners; asbestos; mercury-containing items; live ammunition and explosives; compressed gas cylinders; hazardous chemicals; unlabeled hazardous

* Waste categories from the State of Oregon Department of Environmental Quality Material Categories for the 2016 Waste Composition Study, Field Sorting Categories

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Table 2. CTCLUSI Residential and Commercial Waste Stream Generation and Composition

Generation Rate from all sources	1.5	tons per person per year	Average for five-county area (ODEQ, 2023)
Estimated Residential Generation Rate	0.32	tons per person per year	(Cascadia, 2021)
Population*	499	persons	

Amount of Solid Waste Generated by Source

Generators	Tons	Percent
Residential	159.7	16%
Facilities	90.5	9%
Enterprises	768.9	75%
	1019.1	100%

Material	Estimate of Solid Waste Generated by Source							
	Residential	Tons	Facilities	Tons	Enterprises	Tons	Total Tons	Total Percent
Paper - Recyclable	6.85%	10.94	5.60%	5.07	5.60%	43.07	59.08	5.80%
Cardboard - Recyclable	2.31%	3.69	3.34%	3.03	3.34%	25.69	32.40	3.18%
Paper - Non-recyclable	10.06%	16.07	10.44%	9.45	10.44%	80.27	105.79	10.38%
Plastic - Recyclable	3.83%	6.11	4.27%	3.87	4.27%	32.83	42.81	4.20%
Plastic - Non-recyclable	8.63%	13.77	10.36%	9.38	10.36%	79.65	102.81	10.09%
Yard Debris	4.59%	7.33	1.55%	1.40	1.55%	11.92	20.65	2.03%
Wood	2.88%	4.60	12.78%	11.57	12.78%	98.26	114.43	11.23%
Edible Food	13.72%	21.91	11.73%	10.62	11.73%	90.19	122.72	12.04%
Non-Edible Food Scraps	9.46%	15.10	9.68%	8.76	9.68%	74.42	98.29	9.65%
Tires and Rubber	0.49%	0.78					0.78	0.08%
Diapers	8.91%	14.22	2.70%	2.44	2.70%	20.76	37.43	3.67%
Carpet, textiles, roofing, furniture, insulatic	10.59%	16.91	9.24%	8.36	9.24%	71.03	96.31	9.45%
Glass	3.11%	4.96	8.32%	7.53	8.32%	63.97	76.46	7.50%
Metal - Recyclable	2.89%	4.62	1.83%	1.66	1.83%	14.07	20.34	2.00%
Metal - Non-recyclable	0.59%	0.95	0.83%	0.75	0.83%	6.38	8.08	0.79%
Electronics/Small Appliances	0.68%	1.09	0.98%	0.89	0.98%	7.52	9.49	0.93%
Other Inorganics	10.46%	16.71	3.57%	3.23	3.57%	27.45	47.39	4.65%
Medical Wastes			2.37%	2.15	2.37%	18.22	20.37	2.00%
Hazardous Materials	0.48%	0.77	0.22%	0.20	0.22%	1.69	2.66	0.26%
Totals	100.5%	160.54	100%	90.37	100%	767.39	1018.29	100%

**

Notes:

* Enrolled CTCLUSI members living in the Five-County Area

** Total differs slightly from 100% due to rounding and exclusion of very minor waste categories

Blanks in table indicate percentage was negligible

lbs = pounds

Table 3. Estimate of Waste Generation Quantities by Enterprise

Generator		Casino: Florence		Casino: Coos Bay		Golf Course		RV Park	
Use (unit)	**Rate**	**Quantity**	**Waste***	**Quantity**	**Waste***	**Quantity**	**Waste***	**Quantity**	**Waste***
Casino Space (sf)**	0.0061	76,000	463.60	15,500	94.55				
Food and Beverage (sf)	0.0064					6000	38.40		
Retail (sf)	0.0064					7500	48.00		
Other/Office (sf)	0.0013	15,500	20.15			1500	1.95		
RV Spaces (count)	0.7300							40	29.20
Hotels (room)	0.7300	100	73.00						
Total tons for Enterprises	**768.85**		**556.75**		**94.55**		**88.35**		**29.20**
Percent of Waste Stream by Enterprise:			**72.4%**		**12.3%**		**11.5%**		**3.8%**

Notes:

* Waste in tons per year

** Casino space includes gaming space, food and beverage, entertainment, and retail. Casino Space Rate is average of these uses.

Rate = Generation Rate (tons/unit/year) (CalRecycle 2006)

sf = square feet

All quantities based on publicly available information (Google Earth Pro and casino website)

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Table 4. Estimate of Waste Stream Generation Quantities and Composition by Enterprise

Quantities of Solid Waste		
Current Enterprises (total)	769	tons
Florence Casino	556.8	tons
Coos Bay Casino	94.6	tons
Golf Course	88.4	tons
RV Park	29.2	tons

Material	**Composition**	**Enterprises**	**Florence Casino**	**Coos Bay Casino**	**Golf Course**	**RV Park**
Paper - Recyclable	5.60%	43.07	31.19	5.30	4.95	1.64
Cardboard - Recyclable	3.34%	25.69	18.60	3.16	2.95	0.98
Paper - Non-recyclable	10.44%	80.27	58.12	9.87	9.22	3.05
Plastic - Recyclable	4.27%	32.83	23.77	4.04	3.77	1.25
Plastic - Non-recyclable	10.36%	79.65	57.68	9.80	9.15	3.03
Yard Debris	1.55%	11.92	8.63	1.47	1.37	0.45
Wood	12.78%	98.26	71.15	12.08	11.29	3.73
Edible Food	11.73%	90.19	65.31	11.09	10.36	3.43
Non-Edible Food Scraps	9.68%	74.42	53.89	9.15	8.55	2.83
Diapers	2.70%	20.76	15.03	2.55	2.39	0.79
Carpet, textiles, roofing, furniture, insulation	9.24%	71.03	51.44	8.74	8.16	2.70
Glass	8.32%	63.97	46.32	7.87	7.35	2.43
Metal - Recyclable	1.83%	14.07	10.19	1.73	1.62	0.53
Metal - Non-recyclable	0.83%	6.38	4.62	0.78	0.73	0.24
Electronics/Small Appliances	0.98%	7.52	5.44	0.92	0.86	0.29
Other Inorganics	3.57%	27.45	19.88	3.38	3.15	1.04
Medical Wastes	2.37%	18.22	13.19	2.24	2.09	0.69
Hazardous Materials	0.22%	1.69	1.22	0.21	0.19	0.06
Totals (percentage, tons)	100%	767.39	555.69	94.37	88.18	29.14

Table 5. CTCLUSI Residential Projected Growth

Material and Percent		Year	2023	2033
		Pop.*	499	624
		TPY	160	200
Paper - Recyclable	6.9%	tons	11	14
Cardboard - Recyclable	2.3%	tons	4	5
Paper - Non-recyclable	10.1%	tons	16	20
Plastic - Recyclable	3.8%	tons	6	8
Plastic - Non-recyclable	8.6%	tons	14	17
Yard Debris	4.6%	tons	7	9
Wood	2.9%	tons	5	6
Edible Food	13.7%	tons	22	27
Non-Edible Food Scraps	9.5%	tons	15	19
Tires and Rubber	0.5%	tons	1	1
Diapers	8.9%	tons	14	18
Carpet, textiles, roofing, furniture, insulation	10.6%	tons	17	21
Glass	3.1%	tons	5	6
Metal - Recyclable	2.9%	tons	5	6
Metal - Non-recyclable	0.6%	tons	1	1
Electronics/Small Appliances	0.7%	tons	1	1
Other Inorganics	10.5%	tons	17	21
Hazardous Wastes	0.5%	tons	1	1
Totals	100.5%	tons	160	200

***

Laboratory Waste Generation			
Use (unit)	**Rate (TPY)**	**Quantity**	**Waste (tons)**
Hazardous waste SQG (year)	2.4	1	2.40
Other office (sf)	0.0013	1800	2.34
		Total Tons	**4.74**

Medical Clinic Waste Generation			
Use (unit)	**Rate (TPY)**	**Quantity**	**Waste (tons)**
Hospital (beds)	2.92	3	8.76
		Total Tons	**8.76**

Notes:

* Population - Enrolled CTCLUSI members living in the Five-County Area

*** Total differs slightly from 100% due to rounding and exclusion of very minor waste categories

Pop. - population (estimated to increase 25% in 10 years)

sf - square feet

SQG - Small Quantity Generator

TPY - tons per year

TPY =([population] x [lbs/person/day (from Table 2)] x [days in year])/2000 lbs/ton

Laboratory hazardous waste is estimated at 400 pounds per month (Oregon DEQ 2017)

Laboratory nonhazardous waste is estimated based on the rate for retail uses

Table 6. Projected Future Waste Generation due to Enterprise Expansion

Generator		Florence Casino RV Park		Coos Head Development	
Use (unit)	**Rate**	**Quantity**	**Waste***	**Quantity**	**Waste***
Retail (sf)	0.0064			12000	76.80
RV Spaces (each)	0.7300	60	43.80	20	14.60
Cottages (each)	0.7300				
Total tons for Enterprises	**135.20**		**43.80**		**91.40**

Notes:

* Waste in tons per year

sf = square feet

Rate = Generation Rate (tons/unit/year) (CalRecycle 2006)

RV Park - hotel room rate used for RV spaces and cottages

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Table 7. Cost Savings Opportunities from Waste Diversion

Amount of Solid Waste Generated by Source

Generators	Tons
Residential	159.7
Facilities	90.5
Enterprises	768.9
Total	1019.1

Disposal cost per ton estimate [1] $132.54

Summary Avoided Costs	Potential Diversion Rates			
	30%	50%	70%	90%
Residential	$ 3,152	$ 5,253	$ 7,354	$ 9,456
Facilities	$ 2,128	$ 3,546	$ 4,965	$ 6,383
Enterprises	$ 18,069	$ 30,114	$ 42,160	$ 54,206
Total Avoided Costs/Year	**$ 23,348**	**$ 38,914**	**$ 54,479**	**$ 70,045**

Residential Estimated Waste Generation & Potential Diversion			Potential Diversion															
			30%		Disposal	Avoided	50%		Disposal	Avoided	70%		Disposal	Avoided	90%		Disposal	Avoided
Material	Residential	Tons	Recycle	Compost	$/ton	Costs	Recycle	Compost	$/ton	Costs	Recycle	Compost	$/ton	Costs	Recycle	Compost	$/ton	Costs
Paper - Recyclable	6.85%	10.94	3.28		$132.54	$ 434.92	5.47		$132.54	$ 724.87	7.66		$132.54	$ 1,014.81	9.84		$132.54	$ 1,304.76
Cardboard - Recyclable	2.31%	3.69	1.11		$132.54	$ 146.68	1.84		$132.54	$ 244.46	2.58		$132.54	$ 342.25	3.32		$132.54	$ 440.04
Paper - Non-recyclable	10.06%	16.07																
Plastic - Recyclable	3.83%	6.11	1.83		$132.54	$ 243.12	3.06		$132.54	$ 405.20	4.28		$132.54	$ 567.28	5.50		$132.54	$ 729.36
Plastic - Non-recyclable	8.63%	13.77																
Yard Debris	4.59%	7.33		2.20	$132.54	$ 291.60		3.67	$132.54	$ 485.99		5.13	$132.54	$ 680.39		6.60	$132.54	$ 874.79
Wood	2.88%	4.60		1.38	$132.54	$ 182.87		2.30	$132.54	$ 304.79		3.22	$132.54	$ 426.70		4.14	$132.54	$ 548.62
Edible Food	13.72%	21.91		6.57	$132.54	$ 871.24		10.96	$132.54	$ 1,452.06		15.34	$132.54	$ 2,032.89		19.72	$132.54	$ 2,613.71
Non-Edible Food Scraps	9.46%	15.10		4.53	$132.54	$ 600.57		7.55	$132.54	$ 1,000.96		10.57	$132.54	$ 1,401.34		13.59	$132.54	$ 1,801.72
Tires and Rubber	0.49%	0.78																
Diapers	8.91%	14.22																
Carpet, textiles, roofing, furniture, insulation	10.59%	16.91																
Glass	3.11%	4.96	1.49		$132.54	$ 197.30	2.48		$132.54	$ 328.84	3.47		$132.54	$ 460.38	4.47		$132.54	$ 591.91
Metal - Recyclable	2.89%	4.62	1.39		$132.54	$ 183.61	2.31		$132.54	$ 306.01	3.23		$132.54	$ 428.42	4.16		$132.54	$ 550.83
Metal - Non-recyclable	0.59%	0.95																
Electronics/Small Appliances	0.68%	1.09																
Other Inorganics	10.46%	16.71																
Medical Wastes																		
Hazardous Materials	0.48%	0.77																
Totals	100%	160.54	9.10	14.68		$ 3,151.91	15.16	24.47		$ 5,253.18	21.22	34.26		$ 7,354.46	27.29	44.05		$ 9,455.73

Facilities Estimated Waste Generation & Potential Diversion			Potential Diversion															
			30%		Disposal	Avoided	50%		Disposal	Avoided	70%		Disposal	Avoided	90%		Disposal	Avoided
Material	Facilities	Tons	Recycle	Compost	$/ton	Costs	Recycle	Compost	$/ton	Costs	Recycle	Compost	$/ton	Costs	Recycle	Compost	$/ton	Costs
Paper - Recyclable	5.60%	5.07	1.52		$132.54	$ 201.68	2.54		$132.54	$ 336.14	3.55		$132.54	$ 470.59	4.57		$132.54	$ 605.05
Cardboard - Recyclable	3.34%	3.03	0.91		$132.54	$ 120.29	1.51		$132.54	$ 200.48	2.12		$132.54	$ 280.68	2.72		$132.54	$ 360.87
Paper - Non-recyclable	10.44%	9.45																
Plastic - Recyclable	4.27%	3.87	1.16		$132.54	$ 153.72	1.93		$132.54	$ 256.20	2.71		$132.54	$ 358.68	3.48		$132.54	$ 461.16
Plastic - Non-recyclable	10.36%	9.38																
Yard Debris	1.55%	1.40		0.42	$132.54	$ 55.80		0.70	$132.54	$ 93.00		0.98	$132.54	$ 130.20		1.26	$132.54	$ 167.40
Wood	12.78%	11.57		3.47	$132.54	$ 460.08		5.79	$132.54	$ 766.80		8.10	$132.54	$ 1,073.52		10.41	$132.54	$ 1,380.24
Edible Food	11.73%	10.62		3.19	$132.54	$ 422.28		5.31	$132.54	$ 703.80		7.43	$132.54	$ 985.32		9.56	$132.54	$ 1,266.84
Non-Edible Food Scraps	9.68%	8.76		2.63	$132.54	$ 348.48		4.38	$132.54	$ 580.80		6.13	$132.54	$ 813.12		7.89	$132.54	$ 1,045.44
Tires and Rubber																		
Diapers	2.70%	2.44																
Carpet, textiles, roofing, furniture, insulation	9.24%	8.36																
Glass	8.32%	7.53	2.26		$132.54	$ 299.52	3.77		$132.54	$ 499.20	5.27		$132.54	$ 698.88	6.78		$132.54	$ 898.56
Metal - Recyclable	1.83%	1.66	0.50		$132.54	$ 65.88	0.83		$132.54	$ 109.80	1.16		$132.54	$ 153.72	1.49		$132.54	$ 197.64
Metal - Non-recyclable	0.83%	0.75																
Electronics/Small Appliances	0.98%	0.89																
Other Inorganics	3.57%	3.23																
Medical Wastes	2.37%	2.15																
Hazardous Materials	0.22%	0.20																
Totals	100%	90.37	6.35	9.71		$ 2,127.73	10.58	16.18		$ 3,546.22	14.81	22.65		$ 4,964.71	19.04	29.12		$ 6,383.20

Enterprises Estimated Waste Generation & Potential Diversion			Potential Diversion															
			30%		Disposal	Avoided	50%		Disposal	Avoided	70%		Disposal	Avoided	90%		Disposal	Avoided
Material	Enterprises	Tons	Recycle	Compost	$/ton	Costs	Recycle	Compost	$/ton	Costs	Recycle	Compost	$/ton	Costs	Recycle	Compost	$/ton	Costs
Paper - Recyclable	5.60%	43.07	12.92		$132.54	$ 1,712.67	21.54		$132.54	$ 2,854.45	30.15		$132.54	$ 3,996.23	38.77		$132.54	$ 5,138.01
Cardboard - Recyclable	3.34%	25.69	7.71		$132.54	$ 1,021.50	12.85		$132.54	$ 1,702.50	17.98		$132.54	$ 2,383.49	23.12		$132.54	$ 3,064.49
Paper - Non-recyclable	10.44%	80.27																
Plastic - Recyclable	4.27%	32.83	9.85		$132.54	$ 1,305.38	16.41		$132.54	$ 2,175.64	22.98		$132.54	$ 3,045.89	29.55		$132.54	$ 3,916.15
Plastic - Non-recyclable	10.36%	79.65																
Yard Debris	1.55%	11.92		3.58	$132.54	$ 473.85		5.96	$132.54	$ 789.75		8.34	$132.54	$ 1,105.65		10.73	$132.54	$ 1,421.55
Wood	12.78%	98.26		29.48	$132.54	$ 3,906.98		49.13	$132.54	$ 6,511.63		68.78	$132.54	$ 9,116.28		88.43	$132.54	$ 11,720.93
Edible Food	11.73%	90.19		27.06	$132.54	$ 3,585.98		45.09	$132.54	$ 5,976.63		63.13	$132.54	$ 8,367.29		81.17	$132.54	$ 10,757.94
Non-Edible Food Scraps	9.68%	74.42		22.33	$132.54	$ 2,959.27		37.21	$132.54	$ 4,932.12		52.10	$132.54	$ 6,904.97		66.98	$132.54	$ 8,877.82
Tires and Rubber																		
Diapers	2.70%	20.76																
Carpet, textiles, roofing, furniture, insulation	9.24%	71.03																
Glass	8.32%	63.97	19.19		$132.54	$ 2,543.51	31.98		$132.54	$ 4,239.18	44.78		$132.54	$ 5,934.85	57.57		$132.54	$ 7,630.53
Metal - Recyclable	1.83%	14.07	4.22		$132.54	$ 559.45	7.03		$132.54	$ 932.42	9.85		$132.54	$ 1,305.38	12.66		$132.54	$ 1,678.35
Metal - Non-recyclable	0.83%	6.38																
Electronics/Small Appliances	0.98%	7.52																
Other Inorganics	3.57%	27.45																
Medical Wastes	2.37%	18.22																
Hazardous Materials	0.22%	1.69																
Totals	100%	767.39	53.89	82.44		$ 18,068.59	89.82	137.39		$ 30,114.32	125.74	192.35		$ 42,160.04	161.67	247.31		$ 54,205.77

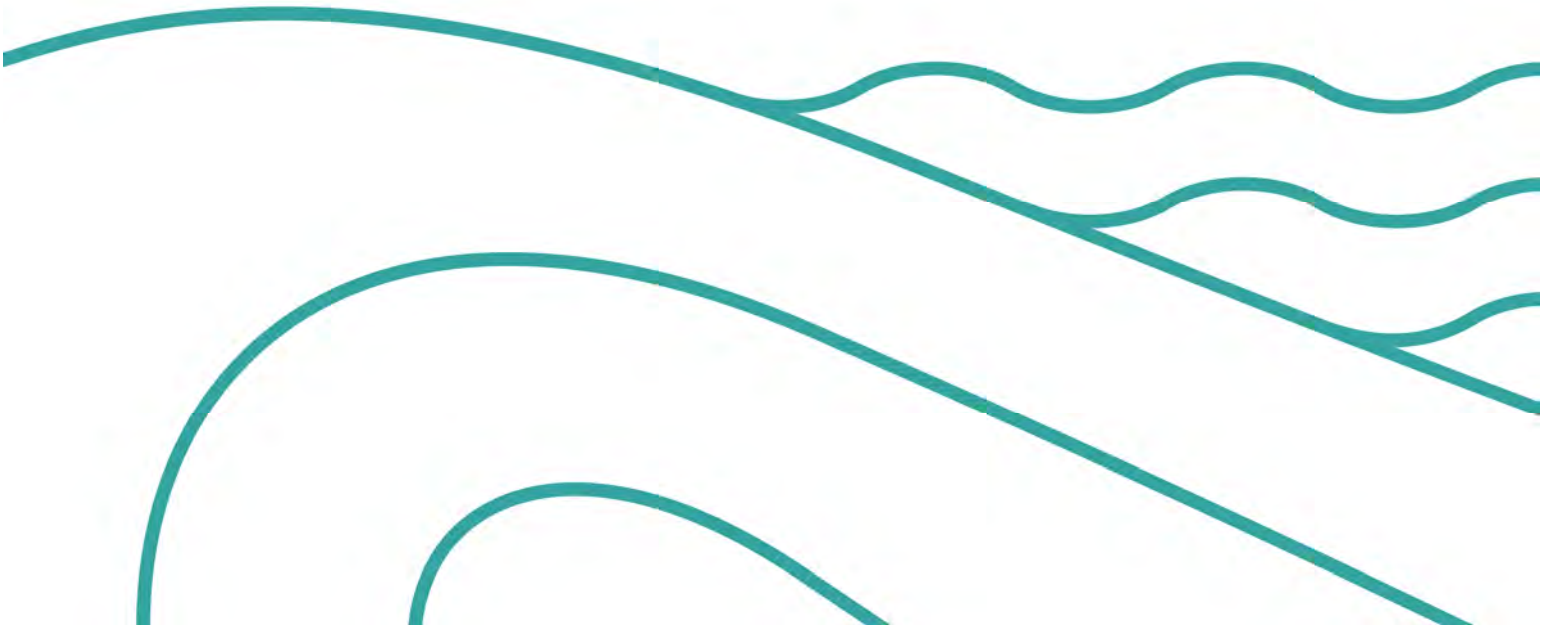
Notes

*Enrolled CTCLUSI members living in the Five-County Area

lbs = pounds

[1] Residential, facilities, and enterprises disposal cost per ton based on financial information provided by CTCLUSI Controller and average waste generation rate

Appendix A
Waste Reduction Tips for Hotels and Casinos



United States
Environmental Protection
Agency

Solid Waste
and Emergency Response
(5306W)

EPA530-F-00-007
April 2000
www.epa.gov/tribalmsw

Waste Reduction Tips For Hotels and Casinos In Indian Country

Tribally owned hotels, motels, resorts, casinos, and bingo halls have numerous opportunities to prevent waste when purchasing supplies and food, serving customers, or cleaning guest rooms. There are approximately 400 hotels, motels, and resorts, and 200 casinos and bingo halls located in Indian Country. These facilities generate a tremendous amount of solid waste, including food waste, glass containers, metal cans, plastics, paper and cardboard. Hotel and casino operators have found that waste prevention reduces purchasing costs and disposal fees. So, waste prevention not only can help protect the environment and conserve natural resources, it makes economic sense.

Starting a Waste Reduction Program

Step 1 - Secure support. A successful waste reduction program requires both a philosophical and financial commitment from facility managers. Without this commitment, employees may be reluctant to fully embrace the program. Designate a "green team" comprised of representatives from each facility operation (e.g., housekeeping, kitchen, grounds keeping, purchasing) to provide support and input for the waste reduction activities.

Step 2 - Conduct a waste characterization study (waste assessment or audit). This study will help determine waste stream composition by identifying waste volumes, existing waste management practices (e.g., reuse, recycling, disposal), and the associated costs. It will help identify which portions of the waste stream could be recycled, reduced, or eliminated altogether. A waste audit also will help to identify disposal costs. Using a full cost analysis approach, taking into account complete lifecycle costs such as procurement, use, and final disposal, can further clarify the true costs of different materials and practices.



(continued on page 4)

Turning Solids into Soil

Eastern Band of Cherokee Indians of North Carolina

The Cherokee Indian Reservation, located in western North Carolina, attracts 5 to 8 million tourists annually. After opening its casino in November 1997, the Eastern Band of Cherokee Indians (EBCI) initiated a pilot project, assisted by $69,500 in EPA grant funding, to evaluate windrow and particle screening processes for composting food waste from their new casino and its three restaurants. EBCI already had an established composting program for wastewater treatment sludge (biosolids) and vegetative waste, and used their experience to develop a progressive system to compost food waste. EBCI collects approximately 1,200 pounds of food waste a day from the casino and its restaurants for composting. The Tribe distributes the final product to landscapers, nurseries, and individual homes both on and off reservation.

EBCI shares information about their program through newsletters and newspaper articles. For more information, contact John D. Long, sanitation manager, at 828 497-6977.

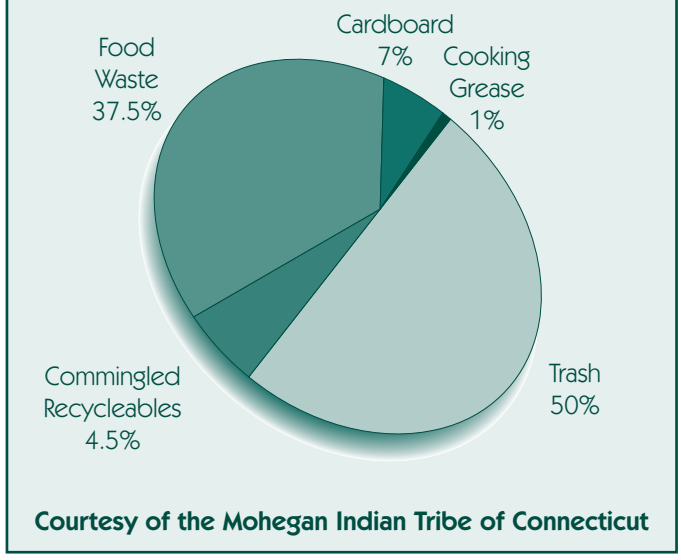
Once is Not Enough at Mohegan Sun Casino

Mohegan Indian Tribe of Connecticut

The Mohegan Tribe of Indians have experienced tremendous success with their waste management efforts. The Tribe's Integrated Pollution Prevention (P2) Program resulted in recycling more than 44 percent of the solid waste stream of the Mohegan Sun Casino and Tribal Office in 1997; that's twice the average recycling rate for towns and cities in Connecticut!

Before the casino was built, the Mohegan P2 Team transformed waste disposal costs into revenue through the sale of recyclable materials such as corrugated cardboard, paper, plastic, cans, and glass. Even more waste was prevented by reusing clothing, toys, books, and other household materials. The casino itself was constructed through adaptive reuse of existing, older buildings. Since the casino's opening, the Tribe has pursued additional environmental initiatives. Automotive emissions from reservation visitors, for example, are voluntarily offset by the Tribe's purchase of emission offset credits from other facilities.

1997 Waste Stream Assessment



Courtesy of the Mohegan Indian Tribe of Connecticut

Food waste was a major problem for the Tribe, constituting 37.5 percent of the waste stream before waste reduction efforts. The Mohegans now send more than 2,190 tons of food waste produced each year in the casino's restaurant operations to an off-reservation piggery for use as feed, avoiding $184,000 in hauling and landfill disposal fees. Pig waste and bedding from the piggery are composted

and reimported onto the reservation for landscaping use, thus "closing the loop" on food wastes. The piggery does not need to grow grain to feed the pigs and the Tribe does not need to purchase peat moss for mulch. The Tribe also sells waste fat, bones, and grease to a renderer for use in the production of animal feed and other products. For example, the sale of approximately 52 tons of cooking grease earns $3,000 annually and avoids $84 a ton in disposal fees, saving another $4,368 a year.

Pollution prevention education of employees and contractors is a key aspect of the Mohegan program. More than 6,000 individuals involved in waste management have been through a P2 training program. The Mohegans also practice environmentally preferable purchasing, buying recycled-content products whenever possible. For more information, contact Dr. Norman Richards at 860 204-6112.

Waste Isn't Worth the Gamble at Foxwoods

Mashantucket Pequot Tribe of Connecticut

Eight years ago, Foxwoods was nothing more than a bingo hall housed in a two-story building in the Connecticut woods. Today, Foxwoods Resort and Casino is bigger than most small towns, employing 11,500 people and hosting more than 55,000 visitors during peak season. According to Mike Van Splinter, Foxwoods' director of environmental services, the Mashantucket Pequot Tribe was able to incorporate environmental designs from the start—rather than having to retrofit an established resort complex—because the Tribe was building in an undeveloped, rural environment. The Tribe made environmental protection a priority well before Foxwoods reached its current size and popularity.

According to Van Splinter, Foxwoods recycles everything that is practical, including glass, steel, aluminum, plastic, and paper. To find the most profitable outlets for common materials such as corrugated cardboard, Foxwoods issues Requests for Proposals (RFPs) to secure vendors. To ensure maximum return on recyclables, Foxwoods purchased a baler to pack the corrugated cardboard and a combination can rinser/crusher to process steel cans. The facility uses more than 260 tons of steel cans in one year, but it recycles about 99 percent of them. The baler and rinser/crusher minimize the volume of Foxwoods' recyclables, increasing both dollar return and the number of vendors willing to accept the materials. To further facilitate its recycling efforts, the Tribe is creating two "mini-MRFs," or materials recovery facilities, which, in addition to processing Foxwoods' materials, also will accept materials from surrounding areas.

The Tribe also has employed a number of waste prevention measures. It has, for example, arranged for used wooden pallets to be picked up by their vendor and house wine to be delivered in bulk recyclable barrels rather than individual bottles. In addition, the Tribe composts its yard trimmings on site and is looking into new technology that can convert its food residuals into energy. To reduce the weight of its waste, the Tribe has invested in dewatering equipment, commonly used by the pulp and paper industry, to extract water from its waste stream (water often comprises more than 30 percent by weight of the waste stream).

Van Splinter cites two important aspects of Foxwoods' waste management practices: separation of recyclables at the point of generation and a strong commitment from the Tribe and the Foxwoods staff. If you have questions about Foxwoods' waste management practices, contact Mike Van Splinter at 860 312-3060.

Starting a Waste Reduction Program

(continued from page 1)

Step 3 - Develop a waste reduction plan. Based on the waste assessment findings, set waste reduction priorities and goals for the facility. Goals should identify the extent to which each waste stream is to be reduced, reused, or recycled (e.g., recycle 20 percent of corrugated packaging).

Step 4 - Implement the program. Once waste reduction goals have been set, educate employees on the waste reduction activities that will become a part of their jobs or responsibilities. Continually monitor, evaluate, and fine-tune waste reduction efforts by identifying more effective and efficient methods of reducing waste, increasing reuse and recycling, and identifying additional opportunities to remove or eliminate materials from the waste stream.

Three R's Checklist:

Reduce, Reuse, Recycle

- Buy in bulk to avoid excess packaging.
- Provide recycling containers in guest rooms and common areas to promote recycling.
- Recycle used bingo cards or purchase reusable ones.
- Compost food, paper, and grass clippings and other yard wastes, and chip larger branches for use as mulch.
- Implement an integrated pest management system to reduce the use of pesticides.
- Replace disposable items with reusable ones (e.g., ceramic mugs versus Styrofoam cups).
- Replace paper hand towels in rest rooms with hand dryers or cloth towel machines.
- Buy recycled-content products (e.g., paper towels, office paper, printer toner cartridges).
- Use plastic lumber made from recycled plastic for benches, tables, fencing, signs and car stops.
- Talk to a local pallet vendor about reusing, reconditioning, or recycling pallets.



HELP CONSERVE RESOURCES!

Linens washed daily in hotels and motels around the world use millions of gallons of water. If you are staying with us for more than one night and feel it is unnecessary to change you bed linens every day, please leave this card on your pillow. Your bed will be made up and you will be helping to conserve water.

Thank you.

SAMPLE

Tips for Reducing Waste

- Sell used decks of cards in casino gift shops as souvenirs (after drilling or cutting corners to prevent unauthorized reintroduction to game tables) or leave them in hotel rooms for your guests' use. The Prairie Island Indian Community in Minnesota donates their used cards to retirement homes, churches, scout troops, and other charitable organizations.

- Reuse—or donate for reuse—shipping, food, and other types of containers. The Lac du Flambeau Band of Lake Superior Chippewa Indians reuses its casino's small plastic coin containers in art projects at a local museum and cultural center, and five-gallon plastic containers find new uses at the fish hatchery and other tribal enterprises.

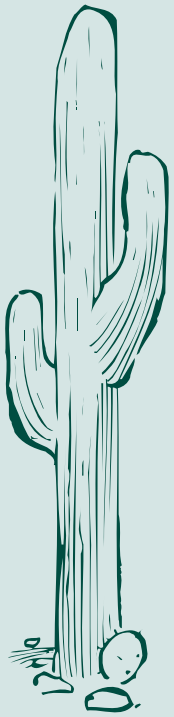
- Compost food, paper, and landscape trimmings on site and use the resulting nutrient-rich humus as a soil amendment or mulch.

- Purchase cleaning products in bulk or in concentrated forms. Educate staff on the proper mixing of concentrates to avoid waste and save money. The Lac du Flambeau Band of Lake Superior Chippewa Indians refills individual cleaning product bottles on housekeeping carts from a centrally located supply dispenser station. The cleaners are nonphosphated products bought in bulk, and reduce nutrient loadings to the environment.

- Install refillable shampoo and soap dispensers in bathrooms rather than using disposable plastic bottles or individual bars of soap.

- Offer guests the option of reusing their linens and towels. The Bois Forte Band of Chippewa provides guests staying more than one night with the option to reuse bed linens and bath towels, which helps reduce water usage.

- Landscape with indigenous plants adapted to the local climate and soil conditions. In dry climates, water requirements are reduced when use of water dependent plants such as lawn grasses is minimized. In other climates, mulching helps plants retain moisture as well as nutrients. Planting indigenous species rather than nonnative ornamental ones also reduces the need for chemical pesticides and fertilizers because the plants are adapted to the area.



- Become a WasteWise partner. Partners commit to reduce waste, establish waste reduction goals, and track their progress. Many tribes have already become partners quickly and easily by signing up online at <www.epa.gov/wastewise> or calling 800 EPA WISE (372-9473).

- Use Environmental Protection Agency guidelines for purchasing goods for your business. EPA programs such as the Comprehensive Procurement Guidelines Program <www.epa.gov/cpg> and Environmentally Preferable Purchasing program <www.epa.gov/opptintr/epp> outline criteria for purchasing products with high recycled content and a reduced effect on the environment.

- Buy long-lasting, energy-efficient fluorescent light bulbs, energy-efficient computers and appliances, and water-efficient fixtures. Consider joining EPA's Greenlights, Energy Star <www.epa.gov/energystar>, and Water Alliances for Voluntary Efficiency <www.epa.gov/owm/genwave.htm> programs. These voluntary partnership programs offer technical assistance, publications, software, and other tools to help make your facilities more energy and water efficient.

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Washington, DC 20460

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Resources

American Hotel and Motel Association. 1993. *Recycling and Source Reduction for the Lodging Industry*. Washington, DC. Available by calling: 202 289-3100.

California Integrated Waste Management Board. 1994. *Waste Reduction in Hotels and Motels*. Sacramento, CA. Available by calling: 800 553-2962.

Georgia Hospitality Environmental Partnership. 1996. *Waste Reduction in Hotels and Motels: A Guide for Hotel and Motel Managers*. Decatur, GA. Available by calling: 404 371-2405.

Greater Chicago Recycling Industry Council. 1994. *Eat, Drink, and Recycle: A Guide to Recycling for Restaurants, Bars, and Clubs*. Chicago, IL. Available by calling: 312 493-2200.

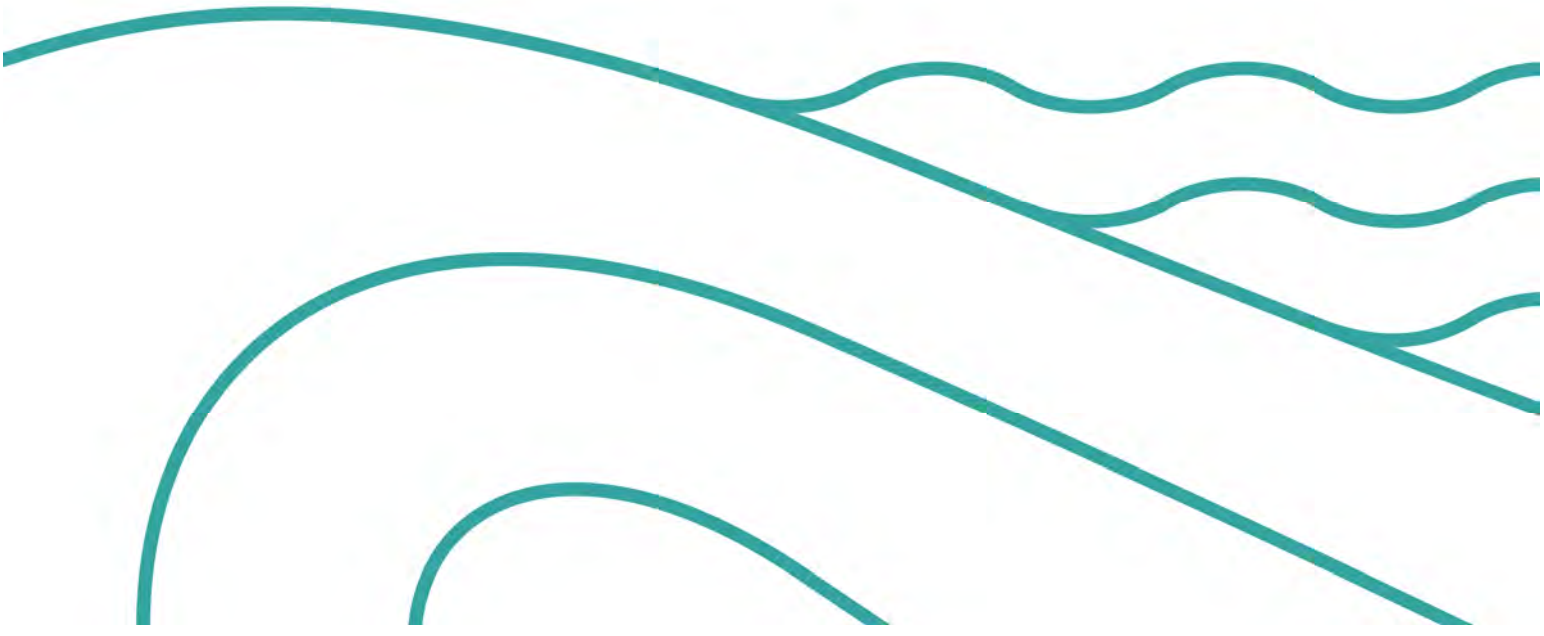
INFORM, Inc. 1996. *Less Garbage Overnight: A Waste Prevention Guide for the Lodging Industry*. New York, NY. Available by calling: 212 361-2400.

Montana Pollution Prevention Program. 1995. *Pollution Prevention in the Hospitality Industry: A Tool Kit for Environmental Management*. Bozeman, MT. Available by calling: 406 994-3451.

National Restaurant Association and U.S. Department of Agriculture. 1997. *Food Donation: A Restaurateur's Guide*. Washington, DC. Available by calling: 800 424-5156.

NYC Department of Sanitation, NYC Department of Environmental Protection, and the Hotel Association. 1994. *Make Waste an Unwelcome Guest: The NYC Guide to Hotel Waste Prevention*. New York, NY. Available by faxing: 212 837-8162.

Appendix B
Compostable Ware



Green Wave *Earth Friendly Tableware*



Individual Sell Sheets >

Please refer to our full line catalog for additional products, details and specifications.

Blended Tableware

Plates, bowls, hinged containers and 5 or 6-compartment school trays. Upscale marbled look - products made from sugarcane and gluten-free wheat stalk. Certified compostable, microwavable and excellent for hot or cold food.

Ovation™

Fitted Lids*

Premium quality lids complement our plates, bowls and portion cups. They're brilliant-clarity, strong, stackable, and excellent for hot or cold food. Our dome lids are made from PET and are 100% recyclable; the portion cup lids are flat, PLA derived and 100% compostable.

Repurpose™

White Bagasse

Plates, bowls, hinged containers and 5-compartment school trays. Clean, crisp, bright white finish – products made from sugarcane resources. Certified compostable, microwavable and excellent for hot or cold food.

EVOLUTION™

Square Plates

Square plates of assorted sizes, with a rectangular accent plate for a polished presentation. This upscale line is pearl white and heavy duty – made from sugarcane resources. Certified compostable.

GREEN SQUARE™

Cutlery

Full and mid-size, certified compostable cutlery made from CPLA (corn starch). Perfect for hot or cold food. Mid-size available in white. Full-size available in white or black. Available in bulk, individually wrapped or package kits.

EPOCH™

Recycled Fiber Products

This compostable product line is made from recycled paper and retains the natural brown color from the paper pulp. The denim-like texture and natural color make this product line well-suited for casual occasions.

REDO™



GREEN WAVE INTERNATIONAL • BROOKLYN, NY • LOS ANGELES, CA • VISIT US AT WWW.GREENWAVE.US.COM

Ovation™

100% Compostable
BPI & ASTM certified

- Upscale marbled look with smooth texture
- Made from sugarcane & gluten-free wheat stalk
- Composts in approximately 12 weeks
- Superior strength and microwavable
- Perfect for hot or cold food
- Withstands oil to 302°, water to 212°



Product	Item No.	Description	Packed Bag/Case	TI / HI Pallet
	OV-P006	6" Round Plate	8x125 / 1,000	15/6 / 90
	OV-P007	7" Round Plate	8x125 / 1,000	10/5 / 50
	OV-P009	9" Round Plate*	4x125 / 500	12/4 / 48
	OV-P010	10" Round Plate* Heavy Wt.	4x125 / 500	12/4 / 48
	OV-P011	10" Round Plate* 3 Compartments	4x125 / 500	12/4 / 48
	OV-P016	7.5" x 10" Oval Pltr.	4x125 / 500	12/5 / 60
	OV-P012	10" x 12.5" Oval Pltr.	4x125 / 500	9/4 / 36
	OV-BL08	8 oz. Round Bowl	4x75 / 300	9/6 / 54
	OV-BL12	12 oz. Round Bowl	4x100 / 400	8/6 / 48
	OV-T023	5 Compartment Tray	4x100 / 400	12/5 / 60
	OV-T026	6 Compartment Tray	5x100 / 500	8/4 / 32

Products and specifications subject to change

* Available with PET recyclable dome lids

Green Wave Products meet BPI and/or ASTM D6400 and D6868 and are designed to be composted in a commercial composting facility. Contact your local Green Wave representative or visit www.greenwave.us.com for more info.

Green Wave
Earth Friendly Tableware

Ovation™

100% Compostable
BPI & ASTM certified

Product	Item No.	Description	Packed Bag/Case	TI / HI Pallet
	OV-B066	6" x 6" x 3" Burger Box	4x100 / 400	8/6 / 48
	OV-B096	9" x 6" x 3" Box	4x75 / 300	9/6 / 54
	OV-B962	9" x 6" x 3" Box 2 Compartments	4x75 / 300	9/6 / 54
	OV-B088	8" x 8" x 3" Box	4x75 / 300	9/5 / 45
	OV-B083	8" x 8" x 3" Box 3 Compartments	4x75 / 300	8/5 / 40
	OV-B099	9" x 9" x 3" Box	4x75 / 300	9/4 / 36
	OV-B093	9" x 9" x 3" Box 3 Compartments	4x75 / 300	9/4 / 36
	OV-B912	9" x 12" x 3" XL Box	2x75 / 150	8/6 / 42

Products and specifications subject to change

New Ovation Items 2017

Ovation™

100% Compostable
BPI & ASTM certified

- Upscale marbled look with smooth texture
- Made from sugarcane & gluten-free wheat stalk
- Composts in approximately 12 weeks
- Superior strength and microwavable
- Perfect for hot or cold food
- Withstands oil to 302°, water to 212°

Product	Item No.	Description	Packed Bag/Case
	OV-BL08	8 oz. Round Bowl	8x125 / 1,000
	OV-BL12	12 oz. Round Bowl	8x125 / 1,000
	OV-BL24	24 oz. Round Bowl	2x100 / 200
	OV-BL32	32 oz. Round Bowl	2x100 / 200
	OV-BLRT30	30 oz. Rectangular Food Tray	2x100 / 200
	OV-BLRT30-3	30 oz. Rectangular Food Tray 3 Compartments	2x100 / 200
	OV-BLB24	8" x 5.35" x 1.57" 24 oz. Ov. Burrito Bowl	2x100 / 200
	OV-BLB32	9.7" x 6.25" x 1.5" 32 oz. Ov. Burrito Bowl	2x100 / 200
	OPC-002	2 oz. Portion Cup	10x100 / 1,000
	OPC-004	4 oz. Portion Cup	10x100 / 1,000

Products and specifications subject to change

Green Wave Products meet BPI and/or ASTM D6400 and D6868 and are designed to be composted in a commercial composting facility. Contact your local Green Wave representative or visit www.greenwave.us.com for more info.

Green Wave
Earth Friendly Tableware

New Lids 2017

Repurpose™

Perfect container lids: retail, to-go or catering

PET Dome Lids — 100% recyclable
- Brilliant clarity and strong

PLA Flat Lids — 100% compostable
- Made from corn resources

Product	Item No.	Description	Packed Bag/Case
	RDL-900	9" Round Plate PET Dome Lid	4x50 / 200
	RDL-100	10" Round Plate PET Dome Lid	4x50 / 200
	RDL-103	10" Round Plate PET Dome Lid 3 Compartments	4x50 / 200
	RDL-2432	24/32 oz. Round Bowl PET Dome Lid	2x100 / 200
	RTDL-30	30 oz. Rectangular PET Dome Lid	2x100 / 200
	BBDL-24	24 oz. Burrito Bowl PET Oval Dome Lid	2x100 / 200
	BBDL-32	32 oz. Burrito Bowl PET Oval Dome Lid	2x100 / 200
	PCL-002	2 oz. Portion Cup PLA Flat Lid	10x100 / 1,000
	PCL-004	4 oz. Portion Cup PLA Flat Lid	10x100 / 1,000

Products and specifications subject to change

GREEN WAVE INTERNATIONAL • BROOKLYN, NY • LOS ANGELES, CA

Green Wave
Earth Friendly Tableware

EVOLUTION™

100% Compostable
BPI & ASTM certified

- Picture perfect clean, bright white finish
- Made from sugarcane resources
- Composts in approximately 12 weeks
- Superior strength and microwavable
- Perfect for hot or cold food
- Withstands oil to 302°, water to 212°



Product	Item No.	Description	Packed Bag/Case	TI / HI Pallet
	TW-POO-001	6" Round Plate	8x125 / 1,000	15/6 / 90
	TW-POO-009	7" Round Plate	8x125 / 1,000	10/5 / 50
	TW-POO-010S	9" Round Plate*	4x125 / 500	12/4 / 48
	TW-POO-010H	9" Round Plate* Heavy Wt.	4x125 / 500	12/4 / 48
	TW-POO-011	9" Round Plate* 3 Compartments	4x125 / 500	12/4 / 48
	TW-POO-013	9.5" Round Plate	4x125 / 500	12/4 / 48
	TW-POO-004	10" Round Plate*	4x125 / 500	12/4 / 48
	TW-POO-005	10" Round Plate* 3 Compartments	4x125 / 500	12/4 / 48
	TW-POO-016	7.5" x 10" Oval Pltr.	4x125 / 500	12/5 / 60
	TW-POO-012	10" x 12.5" Oval Pltr.	4x125 / 500	9/4 / 36
	TW-POO-012XH	10" x 12.5" Oval Pltr. Heavy Wt.	4x75 / 300	10/4 / 40
	TW-BLO-005	8 oz. Round Bowl	8x125 / 1,000	9/7 / 63
	TW-BLO-003	12 oz. Round Bowl	8x150 / 1,200	7/6 / 42
	TW-BLO-006	16 oz. Round Bowl	8x125 / 1,000	7/6 / 42

Products and specifications subject to change

* Available with PET recyclable dome lids

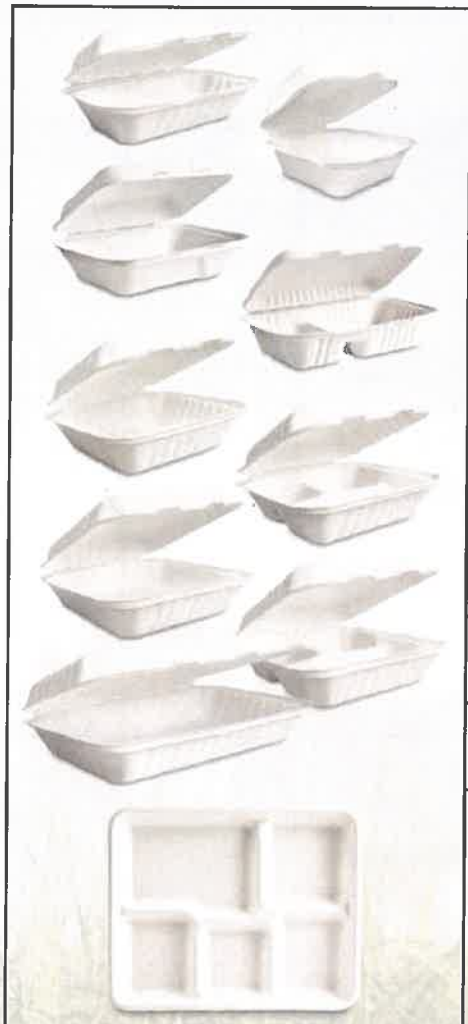
Green Wave Products meet BPI and/or ASTM D6400 and D6868 and are designed to be composted in a commercial composting facility. Contact your local Green Wave representative or visit www.greenwave.us.com for more info.

Green Wave
Earth Friendly Tableware

EVOLUTION™

100% Compostable
BPI & ASTM certified

- Picture perfect clean, bright white finish
- Made from sugarcane resources
- Composts in approximately 12 weeks
- Superior strength and microwavable
- Perfect for hot or cold food
- Withstands oil to 302°, water to 212°

Product	Item No.	Description	Packed Bag/Case	TI / HI Pallet
	TW-B00-002	9" x 5" x 3" Box	4x75 / 300	9/6 / 54
	TW-B00-004	6" x 6" x 3" Burger Box	4x100 / 400	8/6 / 48
	TW-B00-003	9" x 6" x 3" Box	4x75 / 300	9/6 / 54
	TW-B00-005	9" x 6" x 3" Box 2 Compartments	4x75 / 300	7/6 / 42
	TW-B00-010	8" x 8" x 3" Box	4x75 / 300	9/5 / 45
	TW-B00-008	8" x 8" x 3" Box 3 Compartments	4x75 / 300	8/5 / 40
	TW-B00-011	9" x 9" x 3" Box	4x75 / 300	9/4 / 36
	TW-B00-013	9" x 9" x 3" Box 3 Compartments	4x75 / 300	9/4 / 36
	TW-B00-018	9" x 12" x 3" XL Box	2x75 / 150	8/6 / 48
	TW-T00-023	5 Compartment Tray	4x100 / 400	11/5 / 55

Products and specifications subject to change

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Green Wave
Earth Friendly Tableware

GREEN SQUARE™

100% Compostable
BPI & ASTM certified

- Pearl white square plates, smooth texture
- Made from sugarcane resources
- Composts in approximately 12 weeks
- Superior strength and microwavable
- Perfect for hot or cold food
- Withstands oil to 302°, water to 212°

Product	Item No.	Description	Packed Bag/Case	TI / HI Pallet
	GS-P006	6" x 6" Square Plate	4x100 / 400	21/6 / 126
	GS-P008	8" x 8" Square Plate	4x100 / 400	18/5 / 90
	GS-P010	10" x 10" Square Plate	4x75 / 300	16/4 / 64
	GS-T610	6" x 10" Rect. Plate	4x100 / 400	16/6 / 96

Products and specifications subject to change

* Available with PET recyclable lids

Green Square, preferred tableware ... when presentation counts.

Green Wave Products meet BPI and/or ASTM D6400 and D6868 and are designed to be composted in a commercial composting facility. Contact your local Green Wave representative or visit www.greenwave.us.com for more info.



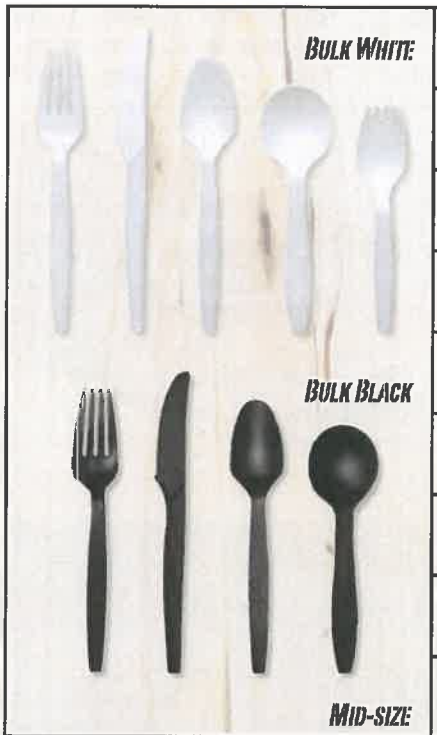
Green Wave
Earth Friendly Tableware

GREEN WAVE INTERNATIONAL • BROOKLYN, NY • LOS ANGELES, CA

EPOCH™

100% Compostable
BPI & ASTM certified

- Pearl finish, made from CPLA (corn starch)
- Full-size available in white or black
- Composts in approximately 12 weeks
- Superior strength, ideal for hot or cold food

Product	Item No.	Description	Packed Bag/Case	TI / HI Pallet
 BULK WHITE:	FORK-WHT	Full-size Fork, bulk white	20x50 / 1,000	12/8 / 96
	KNIFE-WHT	Full-size Knife, bulk white	20x50 / 1,000	15/8 / 120
	SPOON-WHT	Full-size Spoon, bulk white	20x50 / 1,000	12/8 / 96
	SSPOON-WHT	Soup Spoon, bulk white	20x50 / 1,000	20/6 / 120
BULK BLACK	SPORK-WHT	Spork, bulk white	20x50 / 1,000	20/8 / 160
	FORK-BLK	Full-size Fork, bulk black	20x50 / 1,000	12/8 / 96
	KNIFE-BLK	Full-size Knife, bulk black	20x50 / 1,000	15/8 / 120
	SPOON-BLK	Full-size Spoon, bulk black	20x50 / 1,000	12/8 / 96
MID-SIZE	SSPOON-BLK	Soup Spoon, bulk black	20x50 / 1,000	20/6 / 120
	FORK-WHTM	Mid-size Fork, bulk white	20x50 / 1,000	15x8 / 120
	KNIFE-WHTM	Mid-size Knife, bulk white	20x50 / 1,000	16x10 / 160
	SPOON-WHTM	Mid-size Spoon, bulk white	20x50 / 1,000	15x8 / 120

Products and specifications subject to change

CUTLERY READY-TO-GO.

Green Wave Products meet BPI and/or ASTM D6400 and D6868 and are designed to be composted in a commercial composting facility. Contact your local Green Wave representative or visit www.greenwave.us.com for more info.

Green Wave
Earth Friendly Tableware

GREEN WAVE INTERNATIONAL • BROOKLYN, NY • LOS ANGELES, CA

REDO™

- Natural color, denim-like texture
- Made from recycled paper pulp
- Compostable product line
- Strong and microwavable
- Perfect for hot or cold food
- Oil and grease absorbent

Item No.	Description	Packed Bag/Case	Case Weight	L	W	H	Cases/ Layer	Cases/ Skid	Cube	Case UPC
Fiber	*(100% Compostable)*									
TW-TOO-041	9" x 12" Tray	2x125 250	32.89	22.3	19.5	13.0	8 / 4	32	3.26	6936487900288
TW-FOB-045	9" Round Bowl, 45 oz.	4x125 500	30.80	18.9	18.9	14.0	7 / 4	28	2.90	0609728485702







Popular School Products

Item No.	Description	Packed Bag/Case	Case Weight	L	W	H	Cases/ Layer	Cases/ Skid	Cube	Case UPC
Cafeteria-Style Trays – Ovation™										
OV-TO23	5 Compartments	4x100 400	20.36	17.3	13.6	11.4	11/5	55	1.44	0609456642460
OV-TO26	6 Compartments	5x100 500	33.15	18.1	13.4	18.9	8/4	32	2.65	0799928833844
Mid-Size Cutlery *(White)* ***– Epoch™***										
FORK-WHTM	Mid-size Fork	20x50 1,000	12.30	12.8	9.8	7.5	15/8	120	0.54	0611720422302
KNIFE-WHTM	Mid-size Knife	20x50 1,000	10.20	12.4	9.1	5.5	16/10	160	0.36	0611720422319
SPOON-WHTM	Mid-size Spoon	20x50 1,000	12.4	12.4	9.3	8.9	15/8	120	0.59	0611720422326

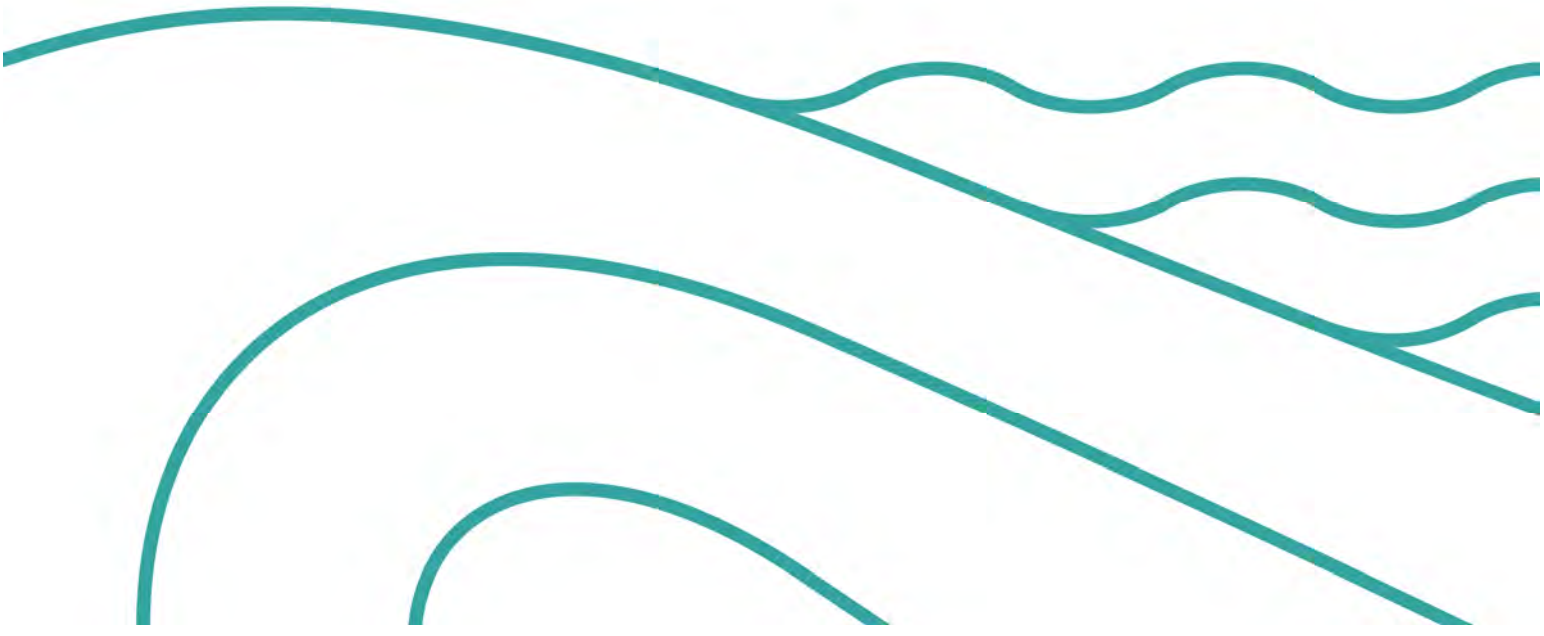






Products & specifications subject to change

Appendix C
Composting



It's easy to make your own compost!



Composting, grasscycling and composting with worms

Metro | *Healthy homes. Healthy families.*



Composting

Instead of tossing out your yard trimmings and vegetable scraps, compost them in your own backyard.

Composting is easy and fun and will help you grow a strong, beautiful garden. Use compost to improve the quality of clay or sandy soil; reduce water and fertilizer needs; and even prevent runoff and pollution of our local rivers, lakes and streams.

Even the first-time composter can make quality compost. Use the guidelines that follow to help you get started.

Contents

About composting. 1
What to compost. 2
How composting works. 3
Composting methods. 4
Uses for compost. 5
Problems and solutions. 6
More uses for yard waste and scraps. . . 7
Compost with worms. 8
Composting demonstration centers. . . 12

About composting

What is compost?

Compost is a dark, crumbly mixture of decomposed organic materials such as grass clippings, leaves, twigs and branches. It is a community teeming with microorganisms that decompose organic material and help the soil generate its own fertilizers. Compost contains nutrients, holds those nutrients in the soil until plants can use them, loosens and aerates clay soils and retains water in sandy soils.

Anything that was once alive will naturally decompose. However, some organic wastes – such as meat or dairy products – should not be composted at home.

Recipe for success

To provide essential nutrients for the microorganisms that make compost, mix one to two parts carbon-rich materials ("browns") such as fall leaves with one part nitrogen-rich materials ("greens") such as grass clippings. Air and water are the other key ingredients. To introduce air, be sure to include enough brown materials – they make compost more fluffy – and turn compost occasionally. Turning also will help compost break down more quickly. Finally, add enough water to make compost as moist as a wrung-out sponge.

Avoid rodents: compost fruit and vegetable trimmings with care!

If you add kitchen scraps to compost, or if there are rodents in your area, use a rodent-resistant composting system to prevent problems. Bins need a lid, a floor and no holes or gaps larger than a quarter inch. And remember: Never add meat, dairy, grains, grease or bread to compost. They are harmless to compost but can attract rodents.



What to compost

YES! Do compost:

Green (one part)

- fresh grass clippings
- green leaves
- plant stalks
- hedge trimmings
- vegetable and fruit scraps
- coffee grounds, filters and tea bags
- egg shells
- horse, cow and poultry manures

Brown (one or two parts)

- woody prunings
- leaves and twigs
- straw
- wood chips
- old potting soil
- shredded newspaper

NO! Do not compost:

- meat or fish parts
- dairy products
- grease, cooking oil or oily foods
- bread or grains
- diseased plants*
- weeds with seed heads and invasive weeds such as morning glory*
- pet wastes

* **diseased plants and weeds with seeds can be placed in yard debris collection containers.**

How composting works

Biology 101. Composting is done by a wide variety of organisms found naturally in organic matter. They work together, feeding on your pile (and each other) to break down materials. Bacteria are the first microorganisms to go to work in your compost pile. They are the most numerous compost makers in the process. Fungi and protozoa soon join the bacteria. Later in the cycle, centipedes, millipedes, beetles and worms move in to finish the job.

Chop it small. If the microorganisms have more surface area on which to feed, the materials will break down faster. Chop garden debris into 6-inch pieces or smaller with pruning shears, or use a chipper/shredder or lawnmower to shred materials to help them decompose faster.

Size matters. Compost piles trap heat generated by the activity of millions of microorganisms. A 3-foot-by-3-foot-by-3-foot pile is considered an ideal size for hot, fast composting.

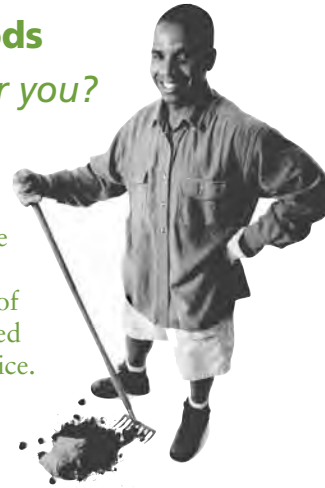
Air and water. Most life on earth needs a certain amount of water and air to survive. Microorganisms in the compost pile work best when the pile is as damp as a wrung-out sponge and has many air passages. Extremes of sun or rain can adversely affect the balance of air and moisture in your pile.

Time and temperature. The most efficient decomposing bacteria thrive in temperatures between 110 and 160 degrees Fahrenheit. The hotter the pile, the faster the composting. A good balance of carbon and nitrogen, lots of surface area within a large volume of material and adequate moisture and aeration will cause the temperature to rise over several days. Hot composting is faster and can kill weed seeds, but quality is just as good in compost made without heat.

Composting methods

Which one is right for you?

No-fuss, hot and worm composting all can produce great compost for your garden while helping you reduce waste at home. The materials you want to compost, the amount of space you have and your desired effort level can guide your choice.



No-fuss composting

This is the easiest method for composting yard trimmings alone or mixed with fruit and vegetable trimmings and requires relatively little garden space (about 3 feet by 3 feet) in sun or shade. For yard trimmings only, you can use an open pile or a simple holding bin made of wire mesh or salvaged lumber.

If adding fruit and vegetable trimmings, use a rodent-resistant bin (see page 1).

Simply add chopped browns and greens to the bin or pile as you generate them. Be sure to mix moist green materials such as fruits, vegetables and grass clippings into the dryer materials of the pile so as not to attract pests. In four to 12 months you should have soil-like compost to harvest at the bottom of the pile.

Hot composting

Hot composting requires a bit more effort and space but is the fastest method for composting yard trimmings alone or mixed with fruit and vegetable trimmings. It can also kill weed seeds and plant diseases.

A two- or three-bin system that allows access to the compost for turning is ideal for hot composting. Mix alternating layers of brown (high-carbon) and green (high-nitrogen) materials in the 2-1 or 1-1 ratio, and dampen the pile as you go. Fill the entire bin with this mixture.

Just after the pile temperature peaks and decreases significantly (usually within one week), turn and mix the materials into the next bin. Repeat a few times, then let compost cure for several weeks. If the material in the pile seems dry, add more water; if it didn't get hot initially, add more high-nitrogen material (or nitrogen fertilizer). The whole process commonly takes one to three months. Compost is finished when it is cool and looks nice and brown.

Worm composting

Worm composting is a fun way to process fruit and vegetable trimmings in a small amount of space indoors or out. For details, see page 8.

Uses for compost



As a soil amendment. Mix 1 to 3 inches of compost into vegetable and flower gardens each year before planting.

As a mulch. Spread 1 to 2 inches of compost around annual flowers and vegetables and up to 4 inches around trees and shrubs. Keep mulch a few inches away from stems to prevent plant diseases.

As a potting mixture. Add one part compost to two parts commercial potting soil, or make your own mixture by using equal parts of compost and sand or perlite.

As compost tea. You can easily make a simple compost extract by putting several handfuls of finished compost in a gallon of water, letting it sit for a few hours and then stirring vigorously. This can be applied to the soil as a mild liquid fertilizer. Aerated compost tea, made for culturing higher numbers of beneficial soil organisms, can be made using special brewers available in some local garden centers. Call Metro for a current list of sources.

Problems and solutions for basic compost bins

Problem: Pile not composting

Too dry. Solution: Add water until compost is moist as a wrung-out sponge, and turn or mix pile.

Too much brown (carbon-rich) material. Solution: Add fresh green (nitrogen-rich) material or organic nitrogen fertilizer, and turn or mix pile.

Problem: Pile smells rotten or attracts flies

Too wet or too many food scraps or lawn clippings. Solution: Turn or mix and add brown (carbon-rich) materials. If you have no brown materials, try dry soil or potting mix.

Food scraps or lawn clippings exposed. Solution: Bury or mix food scraps and lawn clippings into pile and/or cover green materials with a layer of brown materials. Never dump-and-run with moist green materials.

Problem materials. Solution: Remove meat, dairy or grease and turn or mix pile.

Problem: Rodents in bin.

Use traps or bait and follow these recommendations to avoid attracting rodents.

Bin not rodent resistant. Solution: Repair or replace bin so it is rodent resistant. Bin needs a lid, a floor and no holes or gaps larger than a quarter inch.

Problem materials. Solution: Remove meat, dairy or grease, and turn or mix pile.

Too many food scraps. Solution: Turn or mix pile, and add brown (carbon-rich) materials. If you have no brown materials, try dry soil or potting mix.

More uses for yard waste and kitchen scraps

Mulching

Use grass clippings, leaves, straw, sawdust from untreated wood, wood chips or finished compost as mulch around trees, shrubs and other perennial plantings. Mulching suppresses weeds, conserves moisture, reduces soil erosion and protects plants from cold. In annual flower and vegetable gardens, use only nonwoody mulches (e.g., grass clippings or compost) that break down quickly. Keep mulch away from stems to prevent plant diseases.

Burying

You also can incorporate organic materials into the soil by burying them. Till grass clippings, leaves and soft garden wastes directly into garden beds. To bury vegetable and fruit scraps, dig a hole, put scraps in and chop and mix with the soil, then cover with at least 12 inches of soil.

Grasscycling

Grasscycling is the practice of leaving grass clippings on the lawn. When you grasscycle regularly, clippings quickly decompose and release nutrients back into the lawn. You won't have to stop your mower every few minutes to empty the bag, and you don't have to spend time raking cut grass off your lawn.



Grasscycling helps the environment and can save you money. It provides free fertilizer: Leaving clippings on your lawn can satisfy more than 50 percent of the lawn's nitrogen needs and can reduce the time and money spent fertilizing. Lawns stay greener and healthier when clippings are left on them. One application of a slow-release or organic fertilizer in the fall is more than adequate for most grasscycled lawns. By using less fertilizer and fewer pesticides and herbicides, you help reduce waterway pollution.

How to grasscycle

Use any good working mower with a sharp blade or blades. Dull blades can shred grass and make it vulnerable to diseases. If you can't mow regularly, mulching mowers may be better than traditional mowers because mulching mowers cut grass into finer pieces, allowing the pieces to filter down among the standing plants.

Generally, you should mow often enough that you never remove more than about one-third of the grass height at a time. Also, set your mower at a high setting (about 2 1/2 to 3 inches) so grass can better out-compete weeds and retain moisture.

Mowing when grass is dry will allow better distribution of clippings and reduce the chance of clogging the mower.

It can be difficult to mow during the rainy season. When lawn is wet, raise the mower level, cut what you can and compost wet clippings or use as a mulch for garden beds. In following weeks, gradually lower your mower to the proper height.

Grasscycling does not cause thatch. Thatch is made of roots and dead stems that decompose slowly. Grass clippings decompose rapidly and can help make your lawn more vigorous and durable.



Compost with worms

Make kitchen scraps work for you

Worm bins are designed for composting food waste using red worms. Vegetable and fruit scraps from the kitchen are added regularly; the worms eat them and turn them into vermicompost, or "castings."

Four steps to a worm bin

1 The container and the worms

Build a wooden worm bin (plans are available from Metro Recycling Information), buy a plastic tub with a lid or use an old trunk. The container should be between 8 and 16 inches deep, with quarter-inch holes drilled in the bottom for drainage and sides for aeration. Raise the bin on bricks or wooden blocks for air circulation. Place a tray underneath to capture any excess moisture if you keep your bin indoors.

Cover the bin to conserve moisture, provide darkness for the worms and prevent rodents.

Worm bins can sit outdoors or in the basement, shed, garage or balcony. To maintain ideal temperatures inside the bin (55 to 77 degrees Fahrenheit), keep out of direct sun in summer and move indoors or insulate if temperatures drop below freezing in the winter.

Obtain worms from a friend's compost pile or worm bin, or purchase from a local or mail-order supplier. A list of suppliers is available from Metro Recycling Information. Generally, 1 pound of worms is needed per bin. Red worms – also called "red wigglers" or "manure worms" – are recommended because they quickly process food waste into worm compost.

2 Add bedding

Good bedding materials include shredded newspaper or cardboard, brown leaves, straw or untreated-wood sawdust. Fill the bin three-fourths full with bedding that has been dampened with water but isn't soaking wet. Add a handful of dirt to provide grit necessary for the worms' digestion. During the course of several months, the worms will eat the bedding. Add more bedding as necessary to keep a 4-inch layer at all times.

3 Feed worms



- vegetable scraps
- coffee grounds and filters
- tea bags
- fruit peels or pulp

Do not feed worms

- meat or fish
- dairy products
- greasy or oily foods
- pet wastes

To avoid odor or pest problems, don't compost meats, dairy products, oily foods or grains. When adding food to the bin, pull aside some of the bedding and bury the food. Use a different location in the bin each time you add material.



4 Harvest your compost and clean out the bin

After several months, dark, crumbly compost will have collected in a layer on the bottom of the bin. This means it's time to remove some of the finished compost and add new bedding.

Begin by feeding the worms on only one side of the bin. Wait a few weeks until the worms have migrated to that side, then move the bedding from the whole bin to that side. Remove the finished compost from the other side of the bin. Use the compost on your houseplants, on your seedlings or in your garden.

Add new moistened bedding to the empty side of the bin. The next time you add food, place it under the new bedding. Worms will migrate to the new food and bedding to eat.

After several more months, repeat the procedure and remove the finished compost from the other side of the bin.

Worm bin problems and solutions

Problem: Unpleasant odor or flies.

Too wet or food scraps exposed:
Add a 4- to 6-inch layer of dry bedding and stop feeding for a couple weeks.

Problem materials: Remove meat, dairy or greasy foods.

Problem: Worms are dying.

Food and bedding all eaten: Harvest finished compost and add fresh bedding and food.

Too dry: Add water until moist as a wrung-out sponge.

Extreme temperatures: Move bin to a location where temperature is between 55 and 77 degrees Fahrenheit, or insulate to ensure interior temperature is in that range.

Problem: Rodents in bin.

Use traps or bait and follow these recommendations to avoid attracting rodents.

Bin not rodent resistant: Repair or replace bin so it is rodent resistant. Bin needs a lid, a floor and no holes or gaps larger than a quarter inch.

Problem materials: Remove meat, dairy or grease.

Too many food scraps: Add a 4- to 6-inch layer of dry bedding and stop feeding for a couple weeks.

"Problem": Sow bugs, beetles and creepy-crawlies in bin. (Not a problem!)

Healthy worm bins are home to a community of beneficial fungi, insects and other organisms.

Composting demonstration centers

Learn more, and see the results

Each site features active residential-scale compost bins, a worm bin and interpretive signs. The centers are open to the public. Individuals are welcome to take self-guided tours and attend scheduled workshops. Centers are owned by Clackamas Community College and Portland Parks and Recreation.

Directions to the composting centers

Metro Natural Techniques Demonstration Garden. 6700 SE 57th Ave., Portland. From Southeast Woodstock and 57th Avenue, travel south on 57th Avenue to Cooper Street, and park on street. The demonstration garden is on east side of street next to the Brentwood Community Garden. Call Metro Recycling Information for hours and staffing details.

Clackamas Community College site. 19600 S. Mollala Ave., Oregon City. Take Park Place/Mollala exit off Interstate Highway 205. Follow the signs to Clackamas Community College via state Route 213. Turn left on Beavercreek Road. Turn right on Clairmont Drive to enter campus. At first intersection, turn left onto North Douglas Loop. The center is directly across from the baseball field. Parking is next to the site.

Fulton Community Gardens site. Southwest Barbur Boulevard and Miles Street in the Burlingame neighborhood of Southwest Portland. Enter from Southwest Miles Street. Park in the Fulton Park Community Center parking lot. Passenger parking for disabled drivers or passengers is along gravel road adjacent to the site.

Leach Botanical Garden site. 6704 SE 122nd Ave., Portland. This site is on Southeast 122nd Avenue, three blocks south of Foster Road. Park in the main parking lot next to Johnson Creek, then walk a quarter mile, following signs, across the creek and up the hill to the site.

Please note: The centers do not accept public drop-off of yard debris. Call Metro for referral to drop-off locations for materials you do not want to compost at home.

Information and resources

Compost bins

Earth Machine compost bins are available at a deeply discounted price at the MetroPaint store at 4825 N. Basin Ave. on Swan Island in Portland. Bin floors are also now available.

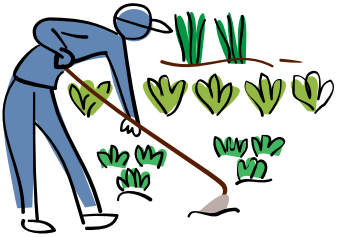
Metro Recycling Information: 503-234-3000

Call for information on compost bins, composting and natural gardening seminars and tours, natural gardening shopper's guides and other composting resources.

www.oregonmetro.gov/compost

Visit our web site for additional information and resources.





Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

Your Metro representatives

Metro Council President – David Bragdon

Metro Councilors – Rod Park, District 1; Carlotta Collette, District 2; Carl Hosticka, District 3; Kathryn Harrington, District 4; Rex Burkholder, District 5; Robert Liberty, District 6.

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Community Composting Best Management Practices

Words in ***bold and italics*** are defined in the glossary in Appendix A.

BEFORE YOU BEGIN

- Do your homework
  - Get trained in the art and science of ***composting***.
  - Map out a realistic plan: what will you ***compost***, who's on your team, what's your end goal?
  - Be aware of existing composting rules and regulations.
- Choose your location and develop a site plan
  - Get to know your potential neighbors.
  - Observe the site. Avoid standing water on the site, even after a rain event.
  - Map out the entire composting process and where everything will be stored.
  - Secure a water source for adding to composting piles (as needed) and cleaning up.
- Choose an animal-resistant composting system:
  - Cover your active composting piles, particularly open windrows, with a ***biocover*** or other ***semipermeable cover***.
  - Use concrete pads or fully enclosed systems for active composting piles.
- Identify site operators and managers that are trained in BMPs.
  - What will be your management plan and schedule?

GETTING STARTED

- Create your recipe: two to three parts ***browns*** to one part ***greens***.
- Avoid problem materials: dairy, meat, oils, fats, grease, diseased plants, aggressive grasses, and weeds.
- Secure ***feedstocks***, tools, and composting process at all stages from weather, ***pests***, and people.
- Secure a reliable source of browns, especially if processing food scraps, animal manures, and other highly putrescible materials.
- Focus on the flow of your site, avoid bottlenecks and clutter. People "smell with their eyes." Rats like places to hide.
- Proactively engage your neighbors! Put up informational signage.
- Start small and simple! Don't bite off more than you and your team can manage. Get a handle on your process, then slowly expand.



▲ Informational signage guides participants on washing buckets used to store food scraps at the NYC Compost Project hosted by Earth Matter NY. *Source: Institute for Local Self-Reliance.*

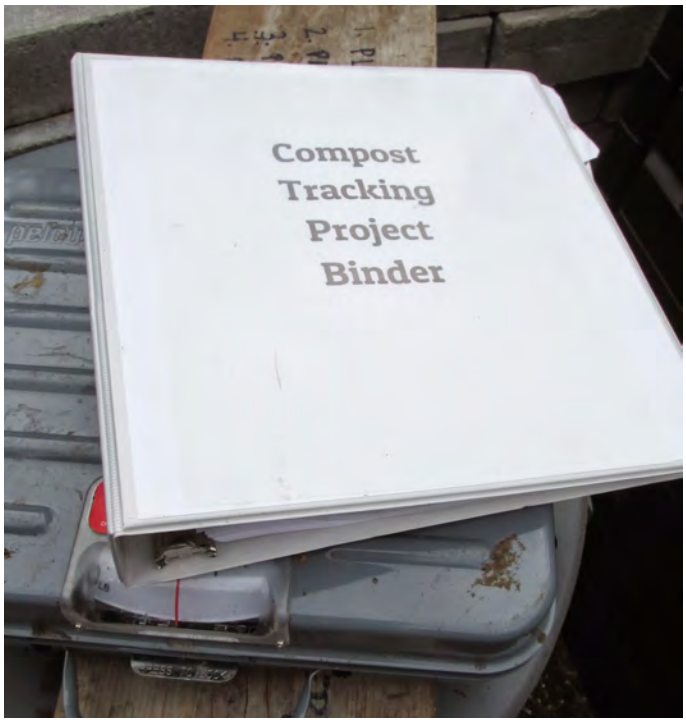
AVOIDING RODENTS

- Place your composting system as far away from any dumpsters or trash cans as possible, or at least make sure that trash cans are well sealed.
- Maintain a buffer of at least 2 feet between your composting system and exterior walls, fences, shrubs, or any other potential hiding spaces for rodents and other animals. A minimum 3-foot buffer is needed around sidewalks, building foundations, concrete slabs, and footings to prevent burrowing. Keep this buffer area clear at all times.
- Set up your system, including the clutter-free buffer zone, on a paved pad. If using an enclosed system, a gravel pad can also be used. A gravel pad should be at least 6 inches deep and use 1-inch diameter or larger stones. If on a paved surface, add an additional strip of gravel 2 feet wide around its edge.

- Rats do not like to feel exposed, so don't give them places to hide! Avoid clutter, piles of materials, tall grasses, and low shrubs around your composting system. If piles of materials are unavoidable, make sure to move them around periodically to prevent housing any unwanted residents.

CONSIDERATIONS FOR SITES COMPOSTING ANIMAL MANURES AND FOOD SCRAPS FROM MORE THAN ONE HOUSEHOLD

- For sites that are composting animal manures and food scraps from more than one household – particularly those creating compost for use in food production – active management, ***thermophilic*** "hot" conditions, and meeting ***Process to Further Reduce Pathogens (PFRP)*** guidelines are recommended.
- Achieve thermophilic conditions by:
  - using an appropriate recipe with sufficient porosity,
  - providing piles with sufficient moisture (but not too much),
  - mixing ingredients thoroughly,
  - building a pile of sufficient size,
  - monitoring temperatures,
  - turning compost piles as temperatures indicate.
- Meet PFRP guidelines:
  - For aerated open piles, bin and in-vessel systems with good insulation (in a vessel or covered with a finished or clean material): active piles should reach 55°C (131°F) or higher for 3 consecutive days.
  - For passively aerated or turned open piles: active piles should reach 55°C (131°F) or higher for at least 15 days (can be nonconsecutive), and receive a minimum of five turnings with at least 3 days between turnings.
- Do not store food scraps, which are highly ***putrescible***, onsite unless they have been ***bokashi***-fermented. The fresher the food scraps, the better. If food scraps cannot be processed into the compost pile immediately, at minimum, add brown material to soak up liquids and prevent ***anaerobic*** conditions.
- Always have enough browns on site.



▲ The Prospect Heights Community Farm tracks management of the composting system and the pounds of food scraps being added. *Source: Institute for Local Self-Reliance.*

- Prevent water that comes in contact with animal manures, raw food scraps, or actively composting piles from entering streams or other bodies of water, or touching edible plants. Minimize ***contact water*** and filter through a meadow, berm, or filtration rain garden. Local rules may determine how this liquid needs to be managed.
- Use layers of material at the base of piles and to cap piles to maintain ***aerobic*** conditions, help manage odors, keep flies away, and contain fungal spores.
  - 6 inches of course browns, such as wood chips, make a good base.
  - Cap your pile with a semipermeable cover, or a biocover: at least 2 inches of finished (screened) compost, 6 inches of unscreened compost, or 12 inches of ***overs*** to prevent pest problems and avoid any nuisance smells.
- Be sure to build composting piles that are of sufficient size (at least 27 cubic feet) and stop adding material as you begin the PFRP process.
- If temperatures don't rise to a thermophilic range within a couple of days of building a pile of sufficient size, or if nuisance odors arise, troubleshoot immediately.

- During the active or thermophilic phase, observe your piles and turn regularly, driven by your observations. At a minimum, turn piles when the temperature peaks and starts to fall, or when temperatures surpass 160°F.
- If problems arise, be ready to cut off food scrap deliveries. These may include complaints from neighbors or regulators, rodent infestations, shortage of browns, or other unmanageable issues.

TABLE 4. IDEAL INITIAL PARAMETERS FOR THERMOPHILIC COMPOSTING

Characteristic	Ideal Range
Moisture (%)	50 - 60
C:N	25:1 - 40:1
Oxygen (%)	> 10
Temperature (°F)	120 - 155
Particle Size (inches)	1/8 - 2
Bulk Density (pounds/cubic yard)	800 - 1000
Pile Size (cubic yard)	> 1

Source: Adapted from the USCC Compost Operations Training Program *(2015).*

MONITORING AND RECORDKEEPING

- Monitor for animal activity and take immediate action to make and keep your site inhospitable to pests.
- For sites composting animal manures and food scraps from more than one household – particularly those creating compost for use in food production – track temperatures, odors, and moisture levels.
- Use compost thermometers, the hand-squeeze test, and your nose to gauge and record temperatures, moisture content, and odor levels throughout the composting process. Allow these measurements to guide your management. This will help assure thermophilic composting conditions are achieved, and nuisance issues and unwanted attention are avoided.
- Record these measurements so you can re-create successful compost mixes, avoid problematic ones, and back up your project in case curious regulators or members of the public inquire.

FINISHING AND TESTING

- ***Cure*** your compost, or allow the composting process to gradually come to a complete finish, in order to produce a chemically stable finished product. Unfinished compost can damage plants.
- Allow a minimum of 4 weeks for curing; 2 to 4 months are preferable.
- Protect or monitor curing and finished compost piles from weather and pests. If employing an open pile system on a sloped site, make sure curing and finished compost piles are uphill of any active piles or raw feedstocks.
- Make sure there are no recognizable original feedstocks in the curing and finished compost. Overs such as tough woody materials and contaminants, like plastic and metal, can be screened out.
- Regularly test your compost quality, especially if you are producing compost for sale, creating compost for food production, or accepting materials that have the potential for pathogens (such as manures, meat, and large amounts of food scraps from off-site).

MANAGING YOUR TEAM

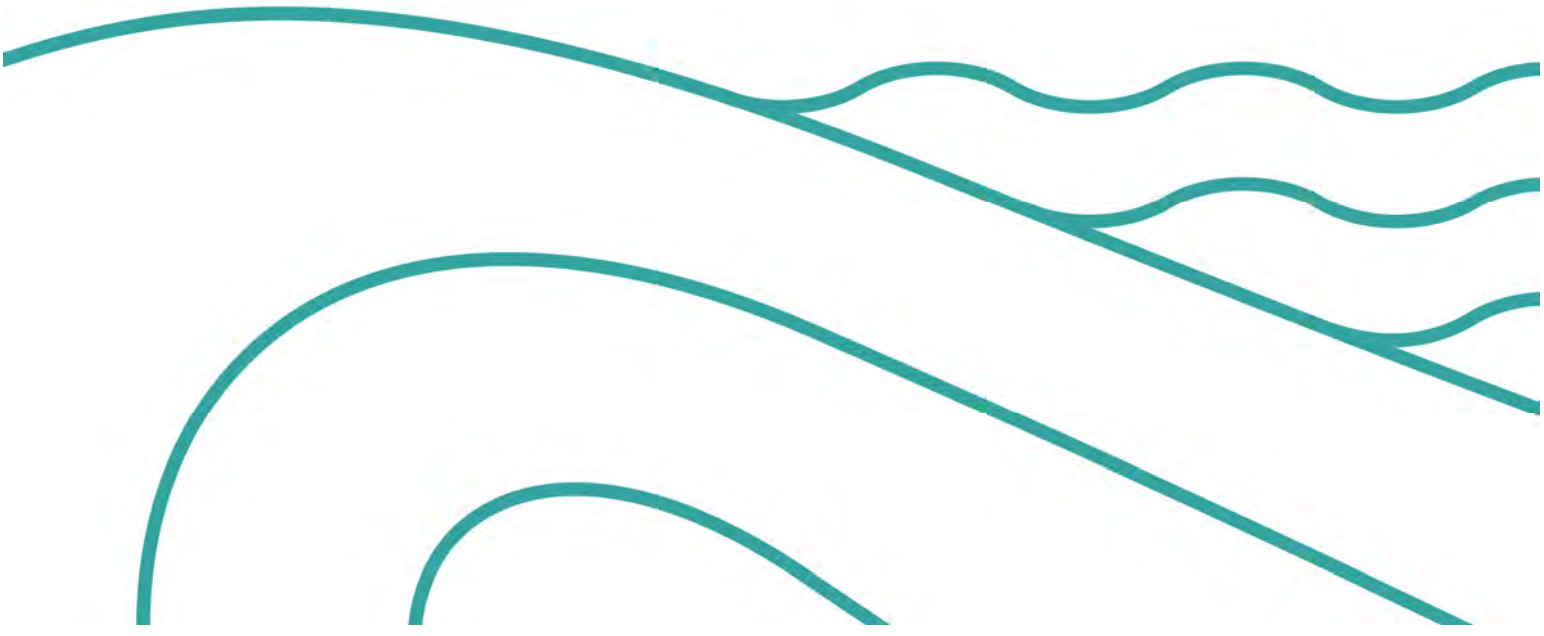
- Avoid burnout! Make sure you have enough managers to allow people time off, particularly in volunteer-managed projects.
- Be realistic. Think about what your dependable labor force can handle. Your ability to enact BMPs should determine what and how much your site is composting.
- Set regular and consistent work days if engaging the community. Have someone responsible for this outreach.

HEALTH AND SAFETY

- Identify all potential hazards present on your site and create basic operating procedures to manage them.
- Be prepared to act on participant safety concerns in a meaningful way as soon as possible.
- Inform participants about ***Aspergillus fumigatus***, a common fungal species found in soil, decomposing leaves, and compost that some people will be sensitive to.
- Wear gloves and wash your hands after removing gloves.
- Rinse composting tools after use and do not use for gardening.

- Protect those likely to be most sensitive. Involve participants and guardians where appropriate to discover anyone potentially susceptible: those with allergies, asthma, weakened immune systems, or who are infection prone.
- Have respirator masks (N95 mask recommended) available for use in dry, dusty conditions and to protect from bioaerosols, particularly for those who have asthma, other respiratory issues, or cystic fibrosis.
- Dispose of all exposed composting materials on site if active rodent burrowing or fresh urine or droppings are present as they may be infected with ***Leptospirosis***, a bacterial disease. Take immediate action to make your site inhospitable to rodents. Contact pest management professionals if the problem cannot be remedied quickly.

Appendix D
Laboratory Waste Management Information



Appendix D
Laboratory Waste Management Information

The following appendix describes options for management of wastes anticipated to be generated by CTCLUSI's environmental laboratory.

Stericycle and HWH Environmental can both provide pickup and disposal services for laboratory waste in the Coos Bay area. Both companies offer services to consult and assist in managing laboratory waste storage, transportation and proper disposal. Quantities and types of chemical waste must be known in order to receive quotes and consultations from the above waste disposal companies. ODEQ and Stericycle offer training programs related to hazardous waste management and planning.

Stericycle and HWH Environmental both required that an account holder or future account holder with knowledge of the organization's waste generator classification under ODEQ and exact amounts and types of waste be known in order to proceed with discussions pertaining to waste disposal services.

The storage regulations, permissible transportation and monetary costs associated with hazardous waste disposal are dependent on the classification of the organization that generates the waste (large and small quantity generators or conditionally exempt). The generator classification is determined by the types and amounts of hazardous waste that are generated on a monthly basis. Conditionally exempt generators produce fewer than 220 pounds of hazardous waste per month, small quantity generators produce up to 2,200 pounds of hazardous waste per month, and large quantity generators produce over 2,200 pounds of hazardous waste per month. CTCLUSI's laboratory is currently (2023) conditionally exempt but anticipates increasing in scale to become a small quantity generator.

The laboratory will be testing for wet chemistry/conventional chemistry parameters (pH, dissolved oxygen, salinity, conductivity, turbidity, temperature and depth, nutrients, chlorophyll, bacteria), environmental pollutants (pesticides, herbicides, PCBs, PAHs, PFAS, pharmaceuticals, drugs and controlled substances, cyanotoxins), metals, environmental DNA, radiocarbon chemistry, and microscopy.

Expected waste steams generated by these processes will include non-hazardous aqueous waste that may require treatment and analytical testing before disposal to the sewer. Hazardous waste may include flammable solvents, non-flammable halogenated solvents, corrosives, and sharps. Solid matrices (soils, vegetation, and fish tissues) that have undergone chemical extraction and spent dry chemicals used in extraction processes will also require disposal.

CTCLUSI Laboratory Analyses and Typical Waste Streams

- Conventional chemistry (pH, dissolved oxygen, salinity, conductivity, turbidity, temperature, and depth)
    - Generally non-hazardous aqueous waste, may require TCLP analysis by laboratory
- Microscopy
    - Samples may include toxic algae (biohazard)
- Bacteria (fecal and total coliform, E. Coli, enterococcus)
    - Generally non-hazardous aqueous waste, may require TCLP analysis by laboratory
- Metals
    - Corrosives (strong acids)
    - Potentially high concentrations of metals in aqueous waste
    - non-hazardous aqueous waste, may require TCLP analysis by laboratory
- Pesticides, PCBs, PAHs, PFAS, pharmaceuticals, drugs and controlled substances, cyanotoxins
    - Flammable solvents (acetone, hexane)
    - Non-flammable solvents (methylene chloride)

    - Corrosives (strong acids and bases)
    - non-hazardous aqueous waste, may require TCLP analysis by laboratory
    - oil used for GCMS and LCMS instrumentation
    - sample matrices
- Environmental DNA
    - Sample matrices are potentially biohazardous
- Radiocarbon
    - Corrosives (acids and bases)

All of the above categories of analyses generate considerable single use plastic waste, along with shipping/packaging materials such as Styrofoam, plastic, and cardboard.

Generator Categories (from ODEQ Laboratory Waste Management Manual):

Conditionally exempt generator (CEG). Generates less than 220 pounds per month of hazardous waste and not more than 2.2 pounds of acutely hazardous waste.

Requirements for CEGs include:

- CEGs must identify all the hazardous waste generated.
- CEGs may not accumulate more than 2200 pounds of hazardous waste at any time.
- CEGs must ensure that hazardous waste is delivered to a person or facility who is authorized to manage it.

Small Quantity Generator (SQG). Generates 200-2200 pounds of hazardous waste per month.

Major requirements for SQGs include:

- SQGs may accumulate hazardous waste on-site for 180 days without a permit (or 270 days if shipping a distance greater than 200 miles).
- The quantity of hazardous on-site waste must never exceed 2200 pounds. • SQGs must comply with the hazardous waste manifest and pre-transport requirements at 40 CFR part 262, subpart B and 40 CFR §§262.30 through 265.33.
- SQGs must manage hazardous waste in tanks or containers, subject to the requirements found at 40 CFR §265.201 and 40 CFR part 265 subpart I except for 40 CFR §§265.176 and 265.178, respectively.
- SQGs must comply with the preparedness and prevention requirements at 40 CFR part 265 subpart C, and the land disposal restriction requirements at 40 CFR part 268.
- There must always be at least one employee available to respond to an emergency. This employee is the emergency coordinator responsible for coordinating all emergency response measures. SQGs are not required to have detailed written contingency plans.

A Large Quantity Generator generates (LQG) generates 2200 pounds or more in any one month or accumulates more than 2.2 pounds of acute (P-listed) hazardous waste.

Major requirements for LQGs include:

- LQGs may only accumulate waste on-site for 90 days. Certain exceptions apply.
- LQGs do not have a limit on the amount of hazardous waste accumulated on-site.
- Hazardous waste generated must be managed in tanks, containers, drip pads or containment buildings subject to the requirements found at 40 CFR part 265, subparts J, I, W and DD, respectively.
- LQGs must comply with the hazardous waste manifest and pre-transport requirements at 40 CFR part 262 subpart B and 40 CFR §§262.30 through 265.33.
- LQGs must comply with the preparedness and prevention requirements at 40 CFR part 265 subpart C, the contingency plan and emergency procedures at 40 CFR part 265 subpart D, and the land disposal restriction requirements at 40 CFR part 268.
- LQGs must submit a biennial hazardous waste report.

Waste Disposal Companies Servicing Coos Bay Area

Stericycle – (877) 378-2023

Hazardous Waste Haulers (HWH) Environmental – (866) 483-3478

References and Resources

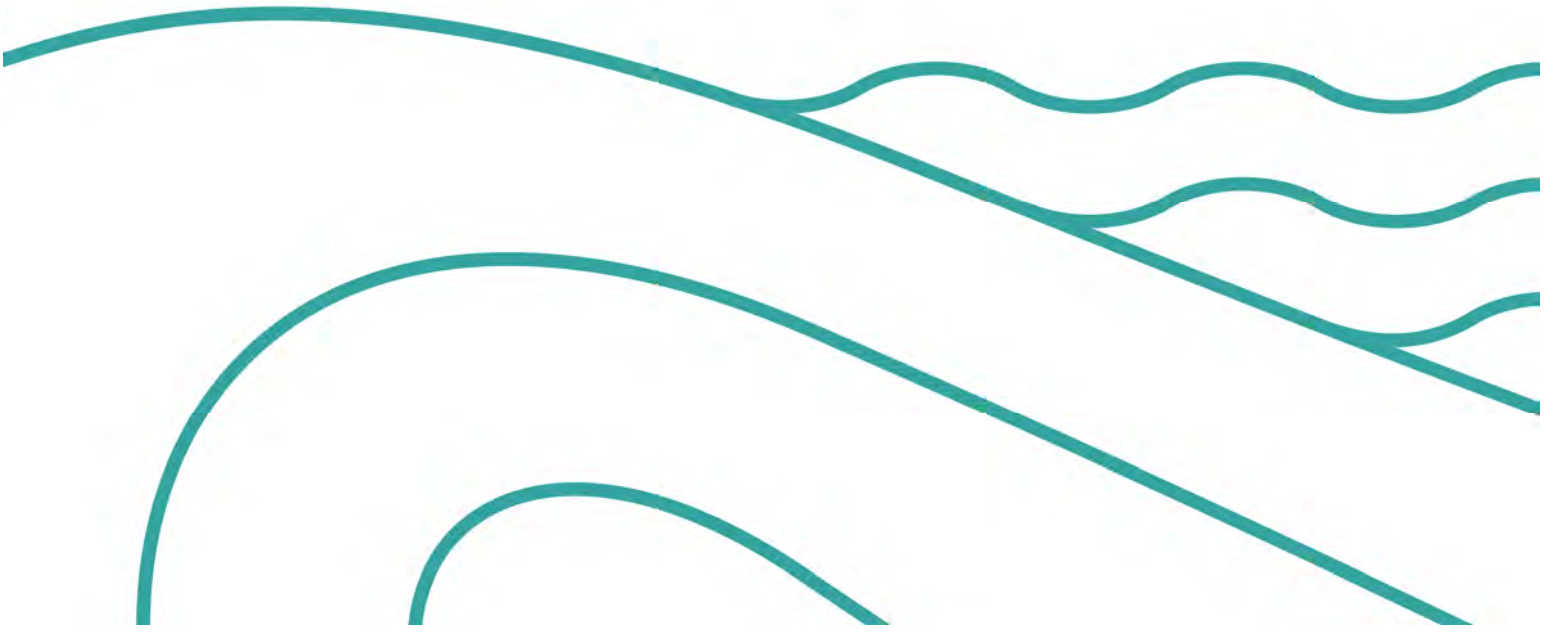
Laboratory Waste Management Manual, Oregon Department of Environmental Quality, 2017

https://www.oregon.gov/deq/FilterDocs/labwastemanual.pdf

Hazardous Waste Determination Fact Sheet, Oregon Department of Environmental Quality, 2023

https://www.oregon.gov/deq/FilterDocs/HWDetermination.pdf

Appendix E
Photographs



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PHOTOGRAPH LOG

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Photograph 26. Glass recycling at West Coast Recycling and Transfer

Photograph 27. Cardboard recycling at West Coast Recycling and Transfer



Photograph 1. Wastewater Treatment Plant in Florence, Oregon



Photograph 2. Qa'aich Housing Development in Florence, Oregon



Photograph 3. Waste disposal option at Qa'aich Development



Photograph 4. Waste disposal options at Three Rivers Casino in Florence, Oregon



Photograph 5. Waste disposal option at CTCLUSI Florence Outreach Office



Photograph 6. Recycling options at Florence Transfer Station



Photograph 7. Special waste disposal at Florence Transfer Station



Photograph 8. Transfer Station in Reedsport, Oregon



Photograph 9. Typical household disposal pickup service in Coos Bay, Oregon



Photograph 10. Janet Niessner and Jess Vazquez at CTCLUSI Tribal Hall



Photograph 11. Waste disposal options at Tribal Hall and Community Center



Photograph 12. Commercial Kitchen in Community Center



Photograph 13. Janet, Jess, and Elijah at developing community garden



Photograph 14. Composting bins at Community Garden



Photograph 15. Disposal bins behind Three Rivers Casino in Coos Bay, Oregon



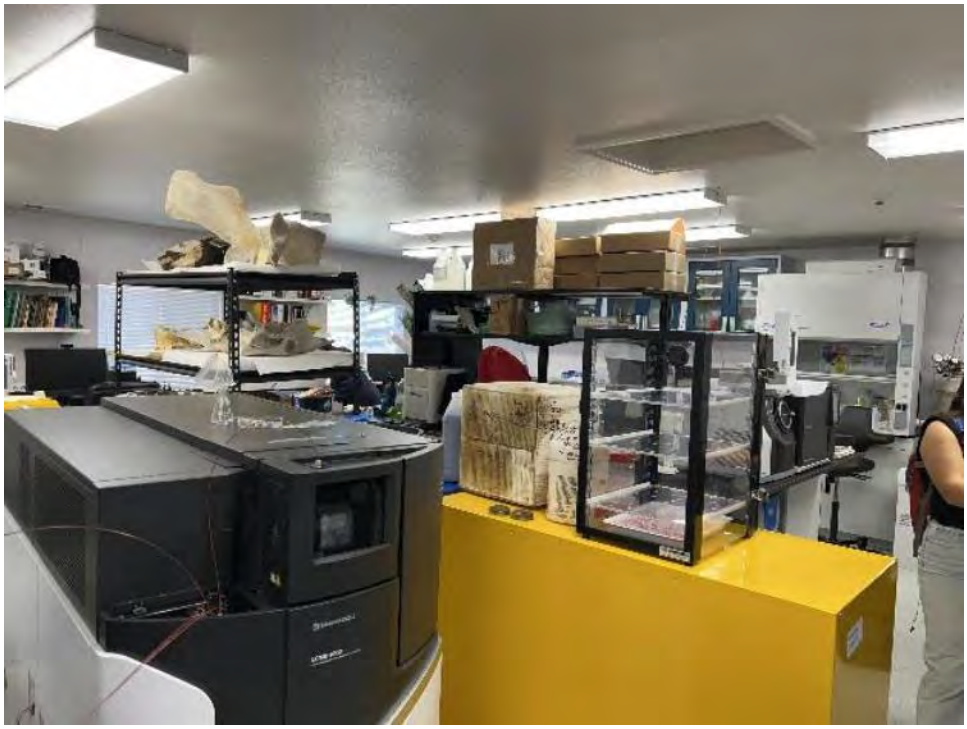
Photograph 16. CTCLUSI Government Offices in Coos Bay, Oregon



Photograph 17. iSecure disposal bins in CTCLUSI Government Offices



Photograph 18. Janet Niessner in CTCLUSI laboratory space



Photograph 19. CTCLUSI laboratory space



Photograph 20. Burn piles near CTCLUSI Government Offices



Photograph 21. Waste disposal options at CTCLUSI Government Offices



Photograph 22. Typical disposal bin size at Qaxas Heights Development



Photograph 23. Roll-off Bin at Qaxas Heights Development



Photograph 24. View of Alishanee Property



Photograph 25. West Coast Recycling and Transfer in Coos Bay, Oregon



Photograph 26. Glass recycling at West Coast Recycling and Transfer

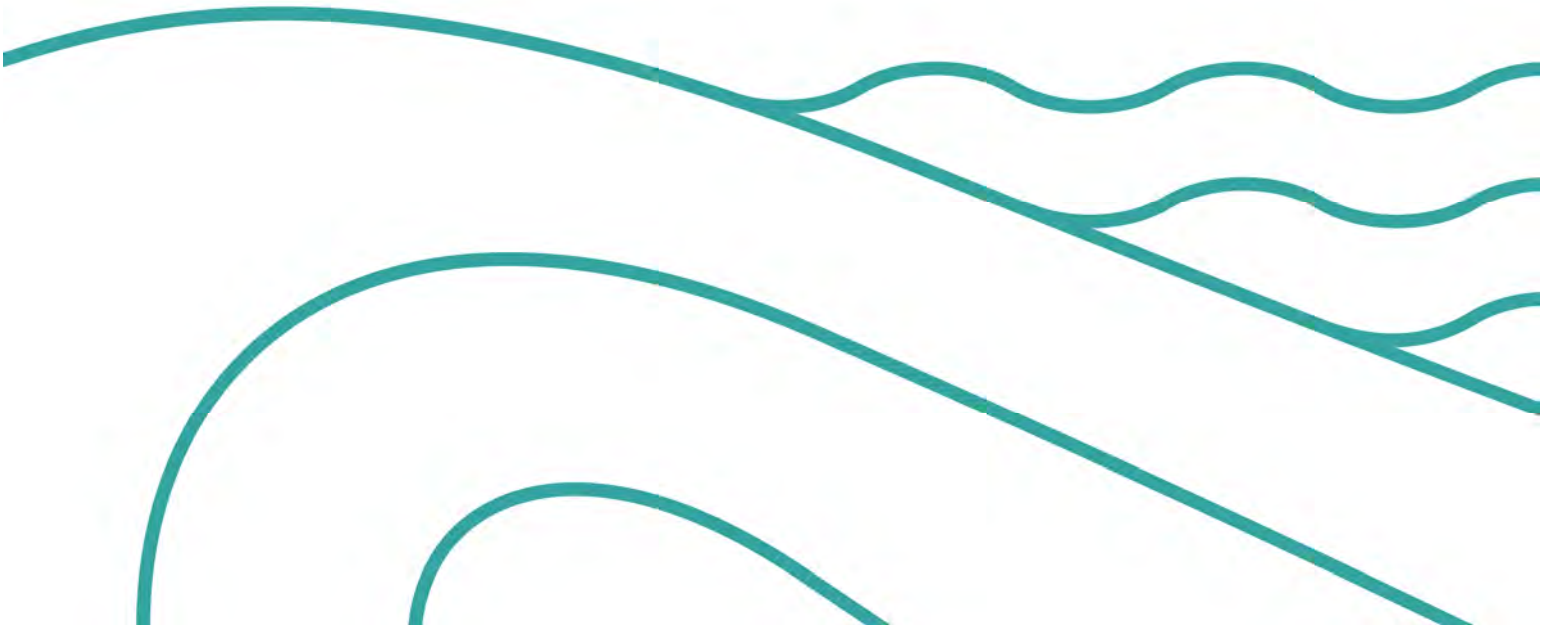


Photograph 27. Cardboard recycling at West Coast Recycling and Transfer



Photograph 28. Administrative building at Coos Head property

Appendix F
Strategic Implementation Plan



Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
Integrated Solid Waste Management Plan
Strategic Implementation Plan for 2024 – 2028

Introduction

During 2023 and 2024, an Integrated Solid Waste Management Plan (ISWMP) was developed for the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI or Tribes). This plan contains information obtained and observations recorded during field reconnaissance within the Five-County Area of Oregon in which most members of the CTCLUSI reside.

The purpose of this Strategic Implementation Plan is to provide a relatively simple and useful roadmap that will guide the Tribes during the next five years (2024 – 2028) as they endeavor to develop and improve their organization and systems to collect, handle, and dispose of solid waste generated by the Tribes' enterprises, facilities, and members.

A strategic plan is designed to answer three basic questions:

(1) Where are we now?

(2) Where do want to go?

(3) How do we get there?

The ISWMP contains the information needed to answer the first question. This Strategic Implementation Plan is included as an appendix to the ISWMP and will provide the structure, framework, and guidance for the Tribes to answer the second and third questions.

The objective of this plan is to maintain and improve Tribal environmental quality through proper management of solid waste. Goals that support this initiative and will lead to the accomplishment of the objective are:

- Describe current waste management practices and challenges and identify potential actions and initiatives to improve the current situation.
- Identify waste management needs for Tribal facilities and residents, develop options, and identify cost-effective approaches to address these needs.
- Identify opportunities to reduce waste generation by promoting waste reduction and diverting reusable, recyclable, and compostable materials out of the current waste stream.
- Review existing Tribal codes and regulations and recommend potential management and enforcement measures to address illegal dumping and disposal of solid waste on Tribal lands and properties.

Challenges, Needs, and Opportunities Related to Solid Waste Management

Solid Waste Advisory Committee (SWAC) – As a first step in implementing this ISWMP, it is recommended that the Tribes form a SWAC. This group of dedicated people will act as a task force to organize, initiate, direct, guide, and monitor the Tribes' solid waste management initiative.

Solid Waste Manager or Coordinator – A person or persons working within the Tribes' organization and dedicated to solid waste management would allow the Tribes to go forward with a well-organized effort and maintain a focused effort on a day-to-day basis. This arrangement would replace the ad hoc efforts of individual department managers who are doing only what is necessary to satisfy their short-term solid waste management needs. The means to do this are not necessarily the best but are what's available at the time. It is recommended that the Tribes assign a dedicated manager who can maintain a focus on solid waste management and coordinate with department managers, the community, and providers of solid waste management services to maintain and improve the Tribes' solid waste management systems.

Illegal Open Dumping – Open dumping on Tribal lands needs to be minimized and eliminated. Several approaches must be considered and tried. These approaches could range from appealing to people's sense of right and wrong to enforcing laws and regulations that prohibit illegal dumping. Landscaping, vegetation management, education, and culturally appropriate signage are measures that can discourage illegal dumping and encourage Tribal members and the public to do the right thing. Additional ideas and resources from EPA are included in Appendix G of the ISWMP dated December 2023.

Codes and Regulations – The Tribes should consider developing solid waste management regulations that would provide rules and guidelines for the Tribal community in how to properly manage solid waste. In addition to providing a basis for encouraging good practices and discouraging bad practices, eligibility for U.S. Environmental Protection Agency (EPA) funding for solid waste management projects is oftentimes conditioned on a Tribe having regulations in place as a prerequisite to receiving EPA funding.

Diversion of Materials and Recovery of Resources – Diverting material resources from the waste stream into beneficial uses is an opportunity that will reduce the cost of solid waste management. Reduction, Reuse, and Recycling are the "3 R's" of solid waste management. Look for opportunities to reduce the volume of materials going into the waste stream. Identify ways to reuse or repurpose materials that are no longer needed for their original purpose. Improve the Tribes' recycling system to collect more recyclable materials in larger containers that are covered and protected from rain, snow, and moisture.

Collection of Recyclable Materials – Materials such as aluminum cans, cardboard, and office paper can be collected and recycled into new products. Recovering these recyclable resources is beneficial to the Tribes and to the environment. The more of these materials the Tribes can divert from its waste stream, the more money the Tribes can save in reduced solid waste handling and disposal costs. Many of the recycling containers that are being used are too small for the amount of cardboard and other discarded recyclable materials. If cardboard is not contained in an enclosed bin between pickups, it often gets wet. Wet cardboard cannot be recycled and will be disposed of as garbage. This is a waste of a valuable resource, and it increases the cost of waste management services. It is recommended that the Tribes adopt an initiative to obtain larger recycling contains with hinged lids that will store large amounts of recyclable materials and keep those materials dry.

Paper Reduction and Recycling – Large quantities of wastepaper are being generated and recycled at substantial cost. It would be better to reduce the amount of wastepaper being generated.

Coordinated Management of Solid Waste Systems – The collection, handling, and disposal of solid waste is not coordinated and managed efficiently. Each department is responsible for its own means and methods of dealing with solid waste. As stated above, a person or persons working within the Tribes' organization and dedicated to solid waste management would allow the Tribes to go forward with a well-organized effort and maintain a focused effort on a day-to-day basis.

Open Burning – It is currently common practice for residents and departments to burn scrap wood and garbage. Although burning greatly reduces the volume of the waste materials burned, it is undesirable due to the emission of toxic substances into the atmosphere and air that community members are breathing. Breathing the smoke and toxic vapors from burning waste materials is very unhealthy, especially for people who suffer from asthma or other respiratory conditions. An asthma attack is a sudden worsening of asthma symptoms that makes breathing difficult. These attacks can be triggered by allergens, toxic vapors, and toxic particles in smoke from open burning. Burning plastics creates and releases some of the most dangerous chemicals to the atmosphere, such as dioxins, which can cause acute and long-term health problems.

Household Hazardous Waste and Other Special Wastes – A more organized, structured, and established system of collection, handling, and disposal of household hazardous waste, medical waste, dental waste, and laboratory waste is needed. Improved organization and consolidation are needed to properly collect, handle, and dispose of these specials wastes. Batteries should not be disposed of with garbage or recyclable materials. A system for collection and proper disposal of batteries as household hazardous waste is needed.

Infrastructure – The Tribes do not have infrastructure to collect, handle, transfer, and dispose of solid waste. The Tribes must rely on existing infrastructure and facilities that are operated by

cities, counties, and businesses. If the existing infrastructure is adequate, and service providers are willing and able to accommodate the Tribes' evolving needs, new infrastructure won't be needed for some time. Since there are operating recycling centers, transfer stations, and landfills within or near the Five-County Area, the Tribes' can rely on these facilities and do not need large Tribal facilities.

Community Outreach and Education - Communication tools are needed to reach out and inform Tribal leaders, managers, and members. New communication tools should be identified, developed, and tried on a pilot basis. Consider all forms of media including newsletters, fact sheets, flyers, signage, posters, websites, social media, etc. Include messaging that encourages people to think about the "3 R's" (Reuse, Reduction, and Recycling). Commission Tribal artists and crafts people to develop artwork and graphics that can be used to emphasize the importance and encourage Tribal members to do the right thing with respect to solid waste management.

Composting - The community garden in Coos Bay offers an opportunity to recycle organic materials from the community such as grass clippings, fallen leaves, and food waste. These common resources can be converted into vegetable products for community consumption. Encouraging Tribal members to drop off compostable materials at the community garden, and organizing pick up events at which Tribal members can pick up compost for their gardens would divert materials out of the waste stream and convert them into valuable resources. Education on gardening and composting could be integrated into after-school activities for children and other community events.

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
Integrated Solid Waste Management Plan
Strategic Implementation Plan for 2024 – 2028

Year 1 (2024)

☐ Form the Solid Waste Advisory Committee (SWAC) to lead the efforts needed to initiate the solid waste management initiative and keep things moving toward achieving a common vision for solid waste management during the next five years.

☐ Agree to meet monthly or as frequently as necessary to initiate and sustain the efforts necessary to establish an effective solid waste management program for the CTCLUSI.

☐ Identify candidates and recommend a qualified person who is willing to lead the Tribes' efforts to organize and improve the Tribes' solid waste management systems.

☐ Include the solid waste manager or coordinator in SWAC meetings and communications.

☐ Review and confirm goals, objectives, and desired outcomes for this initiative.

☐ Establish priorities for each of the goals and outcomes.

☐ Determine how progress will be measured for each goal.

☐ Confirm issues that need to be addressed and improvements that need to be made.

☐ Develop an inventory of household hazardous waste within the community that needs to be collected, handled, and disposed of by a specialized disposal company.

☐ Consider planning, organizing, and conducting a household hazardous waste collection event for community members to collect, handle, and dispose of these wastes in a proper manner.

☐ Consider adopting an initiative to obtain larger recycling contains with hinged lids that will store large amounts of recyclable materials and keep those materials dry.

☐ Consider planning and outreach efforts to encourage Tribal members to use reuse platforms, such as Freecycle, to give and request items. Record interest in these platforms.

☐ Consider planning, organizing, and conducting a composting collection event at the community garden for community members.

☐ Develop an inventory of hazardous medical waste, dental waste, and laboratory waste that needs to be collected, handled, and disposed of by a specialized disposal company.

☐ Have each department develop an inventory of solid waste generated in their area of responsibility each year and estimate the quantity of solid waste by waste type.

☐ Develop a timeline for outreach efforts and contact Tribal artists and schools to get them involved in branding.

☐ Report progress and accomplishments to Tribal Council and managers and request input and guidance for Tribal leaders.

☐ Consider collaborating with EPA and contacts at other Tribal Casinos to advance recycling and composting efforts for CTCLUSI.

Year 2 (2025)

☐ Reconvene the SWAC, recognize returning members, and appoint new members as needed to maintain the energy and momentum needed to lead the efforts needed to initiate the solid waste management initiative and keep things moving toward achieving a common vision for solid waste management.

☐ Agree to meet monthly or as frequently as necessary to initiate and sustain the efforts necessary to establish an effective solid waste management program for the CTCLUSI.

☐ Review the status of initiatives and progress made on goals during the previous calendar year (2024).

☐ Review and confirm goals, objectives, and desired outcomes for this calendar year (2025).

☐ Revisit and re-establish priorities for each of the goals and outcomes.

☐ Determine how progress will be measured for each goal.

☐ Confirm solid waste management issues that need to be addressed and improvements that need to be made.

☐ Conduct research on grant funding available through U.S. Department of Housing and Urban Development (HUD) to support recycling, composting, and community gardens.

☐ Conduct research on Indian Health Service (IHS) and Bureau of Indian Affairs (BIA) programs that provide financial assistance to support solid waste management for Tribal medical, dental, and public health programs.

☐ Review the status and progress of the household hazardous waste initiative and document the quantities of household hazardous waste collected, handled, and disposed of by a specialized disposal company.

☐ Consider coordinating with waste management pick up services to obtain larger recycling containers with hinged lids that will store large amounts of recyclable materials and keep those materials dry.

☐ Consider planning and outreach efforts to encourage Tribal members to use reuse platforms, such as Freecycle, to give and request items. Evaluate interest in these platforms from Year 1. If interest is shown, determine if establishing a Tribal reuse platform may be beneficial.

☐ Review the status and progress of the composting collection event at the community garden for community members. Document the effectiveness of collection event and future needs.

☐ Consider collaborating with a qualified technical professional to evaluate various types of composting systems and equipment to match current needs and opportunities for a composting program.

☐ Review the status of the initiative to collect, handle, and dispose of hazardous medical waste, dental waste, and laboratory waste using the services of a specialized disposal company.

☐ Review the status and update timeline for outreach efforts and contact Tribal artists and schools to get involved in branding.

☐ Have each department report the quantities of solid waste generated in their area of responsibility last year and how can these quantities be reduced or diverted.

☐ Consider developing Tribal regulations for Solid Waste Management. The SWAC should review and refer to example codes from other Tribes and provided by EPA.

☐ Consider obtaining an anaerobic digester to generate energy using biosolids from the wastewater treatment plant. Funding for this type of equipment is probably available from EPA.

☐ Consider searching to identify agricultural facilities and operations that could accept and use food waste from Tribal enterprises to feed livestock.

☐ Consider searching to identify kitchen grease recycling opportunities and appropriate training for kitchen staff.

☐ Consider a multi-phased initiative to reduce and eventually eliminate burning of waste. Phase 1 would include developing alternative disposal methods for the materials that are currently burned. This includes reuse and recycling of discarded wood. Phase 2 should include developing codes, ordinances, and regulations to prohibit and control open burning.

☐ Consider updating the ISWMP and Strategic Implementation Plan.

☐ Endeavor to advance initiatives and achieve goals established during the past year.

☐ Report progress and accomplishments to Tribal Council and managers and request input and guidance for Tribal leaders.

Year 3 (2026)

☐ Reconvene the SWAC, recognize returning members, and appoint new members as needed to maintain the energy and momentum needed to lead the efforts needed to initiate the solid waste management initiative and keep things moving toward achieving a common vision for solid waste management.

☐ Agree to meet monthly or as frequently as necessary to initiate and sustain the efforts necessary to establish an effective solid waste management program for the CTCLUSI.

☐ Review the status of initiatives and progress made on goals during the previous calendar year (2025).

☐ Review and confirm goals, objectives, and desired outcomes for this calendar year (2026).

☐ Revisit and re-establish priorities for each of the goals and outcomes.

☐ Determine how progress will be measured for each goal.

☐ Confirm solid waste management issues that need to be addressed and improvements that need to be made.

☐ Review the status and progress of the household hazardous waste initiative and document the quantities of household hazardous waste collected, handled, and disposed of by a specialized disposal company.

☐ Coordinate with waste management pick up services to obtain larger recycling contains with hinged lids that will store large amounts of recyclable materials and keep those materials dry.

☐ Evaluate interest in reuse platforms from Year 1 and Year 2. If interest is shown, determine if establishing a Tribal reuse platform may be beneficial. Begin development of Tribal reuse platform.

☐ Review the status and progress of the composting collection event at the community garden for community members. Document the effectiveness of collection event and future needs.

☐ Review the status of the initiative to collect, handle, and dispose of hazardous medical waste, dental waste, and laboratory waste using the services of a specialized disposal company.

☐ Review the status and update timeline for outreach efforts and contact Tribal artists and schools to get involved in branding.

☐ Have each department report the quantities of solid waste generated in their area of responsibility last year and how can these quantities be reduced or diverted.

☐ Consider developing or updating Tribal regulations for Solid Waste Management.

☐ Endeavor to advance initiatives and achieve goals established during the past year.

☐ Review the status of initiatives and progress made during the previous calendar year (2024).

☐ Review and confirm goals, objectives, and desired outcomes for this calendar year (2025).

☐ Report progress and accomplishments to Tribal Council and managers and request input and guidance for Tribal leaders.

Year 4 (2027)

☐ Reconvene the SWAC, recognize returning members, and appoint new members as needed to maintain the energy and momentum needed to lead the efforts needed to initiate the solid waste management initiative and keep things moving toward achieving a common vision for solid waste management.

☐ Agree to meet monthly or as frequently as necessary to initiate and sustain the efforts necessary to establish an effective solid waste management program for the CTCLUSI.

☐ Review the status of initiatives and progress made on goals during the previous calendar year (2026).

☐ Review and confirm goals, objectives, and desired outcomes for this calendar year (2027).

☐ Revisit and re-establish priorities for each of the goals and outcomes.

☐ Determine how progress will be measured for each goal.

☐ Confirm solid waste management issues that need to be addressed and improvements that need to be made.

☐ Review the status and progress of the household hazardous waste initiative and document the quantities of household hazardous waste collected, handled, and disposed of by a specialized disposal company.

☐ Coordinate with Tribal artists and students to develop a culturally significant design for hinged recycling bins to encourage recycling.

☐ Evaluate interest in reuse platforms from Year 1, Year 2, and Year 3. If interest is strong, consider establishing a Tribal reuse platform may be beneficial. Begin development of Tribal reuse platform.

☐ Review the status and progress of the composting collection event at the community garden for community members. Evaluate success of composting collection and evaluate if larger scale composting collection is warranted.

☐ Review the status of the initiative to collect, handle, and dispose of hazardous medical waste, dental waste, and laboratory waste using the services of a specialized disposal company.

☐ Review the status and update timeline for outreach efforts and contact Tribal artists and schools to get involved in branding.

☐ Have each department report the quantities of solid waste generated in their area of responsibility last year and how can these quantities be reduced or diverted.

☐ Consider developing or updating Tribal regulations for Solid Waste Management.

☐ Consider updating the ISWMP and Strategic Implementation Plan.

☐ Endeavor to advance initiatives and achieve goals established during the past year.

☐ Report progress and accomplishments to Tribal Council and managers and request input and guidance for Tribal leaders.

Year 5 (2028)

☐ Reconvene the SWAC, recognize returning members, and appoint new members as needed to maintain the energy and momentum needed to lead the efforts needed to initiate the solid waste management initiative and keep things moving toward achieving a common vision for solid waste management.

☐ Agree to meet monthly or as frequently as necessary to initiate and sustain the efforts necessary to establish an effective solid waste management program for the CTCLUSI.

☐ Review the status of initiatives and progress made on goals during the previous calendar year (2027).

☐ Review and confirm goals, objectives, and desired outcomes for this calendar year (2028).

☐ Revisit and re-establish priorities for each of the goals and outcomes.

☐ Determine how progress will be measured for each goal.

☐ Confirm solid waste management issues that need to be addressed and improvements that need to be made.

☐ Review the status and progress of the household hazardous waste initiative and document the quantities of household hazardous waste collected, handled, and disposed of by a specialized disposal company.

☐ Coordinate Tribal artists, students, and Tribal members to implement and paint the hinged recycling bins with the determined design. Consider a recycling bin painting event.

☐ Evaluate interest in reuse platforms from Year 1- 4. Consider planning, organizing, and promoting Tribal reuse platform. Encourage Tribal members to list items and exchange items rather than purchasing new items.

☐ Review the status and progress of the composting collection event at the community garden for community members. Implement larger scale composting initiatives if warranted.

☐ Review the status of the initiative to collect, handle, and dispose of hazardous medical waste, dental waste, and laboratory waste using the services of a specialized disposal company.

☐ Review the status and update timeline for outreach efforts and contact Tribal artists and schools to get involved in branding.

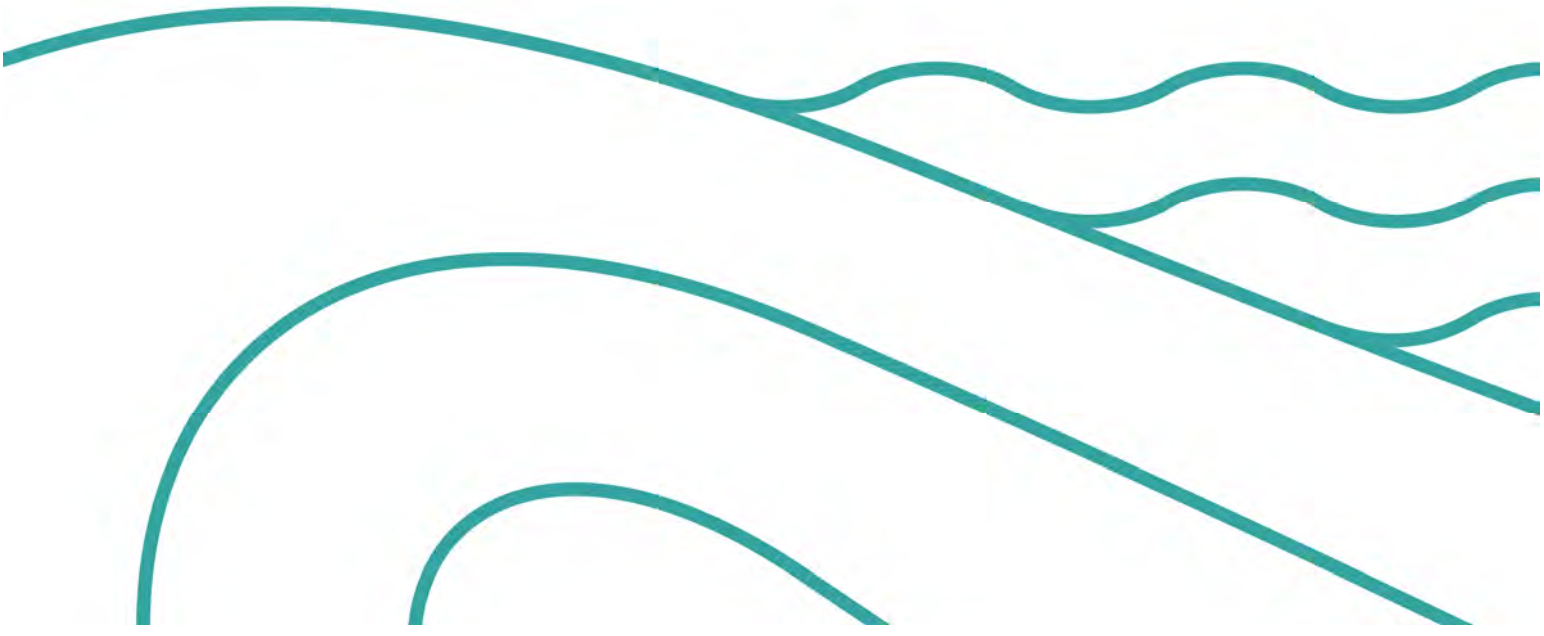
☐ Have each department report the quantities of solid waste generated in their area of responsibility last year and how can these quantities be reduced or diverted.

☐ Consider developing Tribal regulations for Solid Waste Management.

☐ Endeavor to advance initiatives and achieve goals established during the past year.

☐ Report progress and accomplishments to Tribal Council and managers and request input and guidance for Tribal leaders.

Appendix G
Resources and Funding Sources



Appendix G. Resources and Funding Sources

This appendix identifies resources that might be available from EPA, County, or State programs and private sector sources to support the Tribes' solid waste management program. It is key to diversify funding sources to guard against future funding cuts from any one entity.

- ODEQ gives Materials management grants (on pause anticipated to restart in 2024). Can fund food banks, recycling, reuse and repair/salvage.
- Oregon is planning to develop new recycling grants for Tribes in the near future.
- EPA provides examples for reducing illegal dumping on Tribal lands from the Confederated Salish and Kootenai Tribes and Santee Sioux Nation that may provide helpful ideas. https://www.epa.gov/tribal-lands/tribes-training-tribes-sustainable-waste-management-programs-confederated-salish-and#raising. It is important to note that EPA and Indian Health Service require solid waste codes and ordinances to be eligible for funding. EPA includes resources on developing and implementing tribal solid waste codes and ordinances. https://www.epa.gov/sites/default/files/2021-05/documents/developing_and_implementing_tribal_waste_management_codes_508.pdf and https://www.youtube.com/watch?v=EUuW09ykuxU.
- The Bipartisan Infrastructure Law provides funding for solid waste infrastructure for recycling grants for Tribes. https://www.epa.gov/infrastructure/solid-waste-infrastructure-recycling-grants-tribes-and-intertribal-consortia#questions.
- EPA provides grants for household hazardous waste management, development of solid waste codes and ordinances, addressing open dumping. EPA's website includes a directory of funding resources for Tribal waste management.

https://www.epa.gov/tribal-lands/tribal-waste-management-funding-resources-directory

An EPA grant was awarded to Portland State University for a project that could support the CTCLUSI's enterprises in waste reduction. This project, a partnership between Portland State University's (PSU's) Community Environmental Services unit, PSU's Institute on Tribal Governance, the Northwest Native American Chamber of Commerce, and the Sustainable Purchasing Leadership Council, will provide technical assistance to Native-owned/-serving businesses to promote sustainable purchasing plans incorporating chemical reduction, best practices for improving workplace environmental health, and increasing the use of EPA-preferred products (including Safer Choice–certified products). Technical assistance will include cocreating a culturally relevant sustainable product and procurement policy curriculum, providing industry-specific procurement

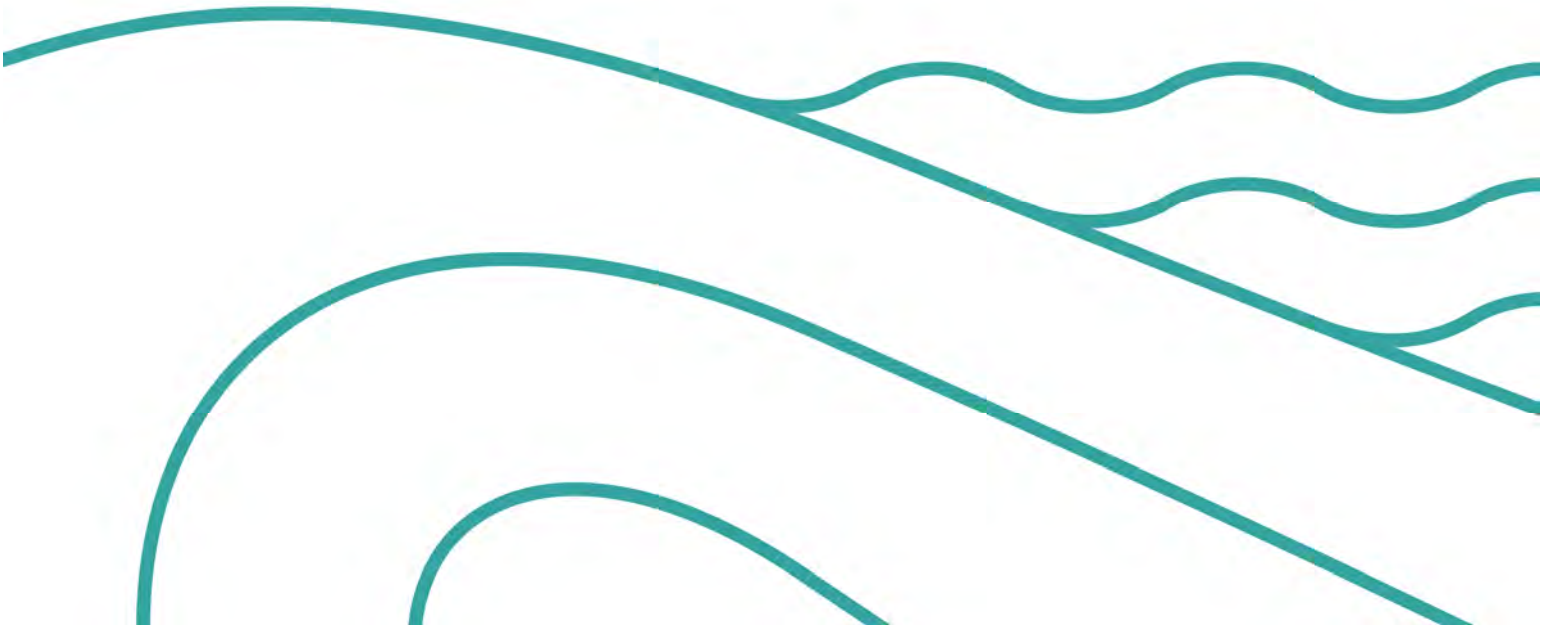
resources, offering coaching support for implementing new technologies, and holding remote trainings (live webinars) for businesses. The proposed project will improve human health and the environment in disadvantaged communities by reducing pollution and exposure to toxins in Tribal communities across Oregon.

- Information on development Tribal waste management codes and example code language can be found on EPA's website and through the Institute for Tribal Environmental Professionals (ITEP). References can be found using the two links below:

  https://www.epa.gov/system/files/documents/2021-10/twj-12-final-25oct2021-508.pdf

  https://www.epa.gov/sites/default/files/2021-05/documents/developing_and_implementing_tribal_waste_management_codes_508.pdf

Appendix H
Responses to EPA Comments



RIDOLFI Environmental

Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Tribes
Integrated Solid Waste Management Plan (December 2023)
EPA Comments and Responses from CTCLUSI

1. Comment on Page 14 of 140: *Possible HUD grants for recycling, composting, community gardens, etc.*

   Response: It is recommended that the CTCLUSI (Tribes) conduct research on grant funding available through HUD for recycling, composting, and community gardens in Tribal housing areas. This recommendation has been added to Appendix F (Strategic Implementation Plan).

2. Comment on Page 15 of 140: *See our previous comment on this 8 lbs/day amount which is higher than EPA rates.*

   Response: The generation rate of 8 pounds per person per day was taken from the State of Oregon waste composition study of 2021. This generation rate is a combined rate for all solid waste generated from all sources in the Five-County Area (residential, commercial, industrial, etc.). This section of the plan has been clarified to avoid confusion.

   Oregon Department of Environmental Quality (ODEQ). 2023. 2021 *Oregon Material Recovery and Waste Generation Rates Report*. Accessed at: https://www.oregon.gov/deq/recycling/Documents/2021MRWGRatesReport.pdf

3. Comment on 15 of 140: *Is this Table 1?*

   Response: The waste composition information shown in the pie chart at the top of Page 16 of 140 is taken from Table 2.

4. Comment on Page 17 of 140: *Is waste burning allowed on Tribal lands? Emissions from burn piles and barrels can have negative air quality impacts and increase the danger of wildfires.*

   Response: Yes, waste burning is allowed on Tribal lands; however, the Tribes recognize the health, safety, and environmental risks associated with burning waste. It is recommended that the Tribes establish an initiative to reduce and eventually eliminate burning of waste by providing better alternatives to recycle or dispose of combustible materials in the waste stream. This recommendation has been added to Appendix F (Strategic Implementation Plan).

5. Comment on Page 17 of 140: *8 lbs/day of trash generated was used for both of the Residential and Facilities. Likely different rates for these.*

Response: The 8 lb/day generation rate is a combined rate for residential, facilities, and self-haul (all sources excluding Enterprises). A generation rate that is less than 8 lb/day is used for component waste streams. See Table 2 in the ISWMP that estimates the breakdown by source.

6. Comment on Page 21 of 140: *Potential opportunities for partnering to consolidate waste and reducing costs.*

   Response: It is recommended that the Tribes establish an initiative to consolidate, centralize, and coordinate Tribal waste management services throughout the Five-County Area. Appendix F describes a Solid Waste Advisory Committee that would coordinate this consolidation.

7. Comment on Page 22 of 140: *Do the solid waste codes and ordinances need to be revised? EPA has copies of Tribes' solid waste codes that can be shared.*

   Response: Yes, to support a Tribal initiative to improve its solid waste management program, the associated codes, ordinances, and regulations should be revised and updated. It is recommended that the Tribes conduct a review of their solid waste management codes and ordinances and develop regulations to support the improvements and initiatives recommended in this ISWMP. Once these are updated, a frequency should be established to revisit, review, and update the codes, ordinances, and regulations. A frequency of at least three years is recommended. This recommendation has been added to Appendix F (Strategic Implementation Plan).

8. Comment on Page 23 of 140: *Possible Anaerobic Digester project, small capacity units are now available as is grant funding.*

   Response: Information about anaerobic digesters can be provided to the appropriate people involved in wastewater treatment for CTCLUSI. This recommendation and information have been added to Appendix F (Strategic Implementation Plan).

9. Comment on Page 23 of 140: *Previously it was stated that the Tribe enforces illegal dumping which is a type of solid waste regulation.*

   Response: It is recommended that the Tribes review their laws, codes, and regulations and determine which apply to solid waste management. This review should be part of the initiative to update and develop effective codes, ordinances, and regulations that support improvements to the Tribes' solid waste management program. Regulations that prohibit

and control illegal dumping will be an integral part of the improved solid waste management program.

10. Comment on Page 25 of 140: *Is any of the wood used for firewood, landscaping or other purposes?*

    Response: Yes, some of the discarded wood is used for firewood, landscaping, and other purposes; however, these alternatives to burning and landfill disposal are currently limited. It is recommended that the Tribes solid waste management initiatives include identifying ways to reuse and recycle used wood products. By establishing alternatives to disposal and burning, the Tribes can greatly reduce the health, safety, and environmental risks associated with burning used wood. This recommendation has been added to Appendix F (Strategic Implementation Plan).

11. Comment on Page 26 of 140: *Is this at both casinos?*

    Response: This paragraph will be revised in the Revised ISWMP to state that the casinos at both Florence and Coos Bay do not separate materials from the solid waste stream for recycling and composting.

12. Comment on Page 27 of 140: *Potential IHS or BIA funding for solid waste management at new medical clinic, etc.*

    Response: It is recommended that the Tribes conduct research into Indian Health Service (IHS) and Bureau of Indian Affairs (BIA) programs that provide financial assistance for Tribal medical, dental, and public health programs. This recommendation has been added to Appendix F (Strategic Implementation Plan).

13. Comment on Page 28 of 140: *How is this solid waste collected?*

    Response: Section 4 describes that the RV resort currently has containers for garbage but no recycling bins.

14. Comment on Page 28 of 140: *What is the status of this project?*

    Response: Periodic updates on the Coos Head project may be requested from the CTCLUSI Chief Executive Officer.

15. Comment on Page 31 of 140: *Tribes have developed composting programs and there are various types of indoor and outdoor systems.*

Response: It is recommended that the Tribes conduct research into the various types of composting systems and equipment that are available and match their current needs to existing opportunities for composting. The options available for composting should be evaluated by a qualified technical professional who can recommend the best systems currently available. This recommendation has been added to Appendix F (Strategic Implementation Plan).

16. Comment on Page 32 of 140: *Consider deleting this section. It's discussion of the hazards is useful, but also noted elsewhere.*

    Response: After considering the downside of redundancy and the advantage of repeating this important message, it is recommended that this section remain in the ISWMP.

17. Comment on Page 34 of 140: *Schools, community centers, health centers, tribal housing, etc. Tribal website, Facebook page, newspaper and/or newsletters.*

    Response: These additional media platforms have been added to the list of potential community outreach tools.

18. Comment of Page 34 of 140: *Community Based Social Marketing*

    Response: Community-based social marketing is a potential outreach method that would utilize the tools listed in this section.

19. Comment on Page 36 of 140: *Hiring solid waste staff or assigning current staff to implement the Plan is critical.*

    Response: It is recommended that the Tribes establish a solid waste management department and assign qualified employees, either current employees or new hires, to manage, supervise, and conduct solid waste management activities. This recommendation will be emphasized in the revised ISWMP.

20. Comment on Page 39 of 140: *These are typically classified as construction and demolition waste (C&D) and not as residential waste.*

    Response: The data from the Oregon Department of Environmental Quality waste composition study categorized dirt, rocks, and pet litter in residential waste as "other inorganics." Table 2 and the pie chart in Section 3 of the ISWMP show that these comprise about 11 percent of residential solid waste.

21. Comment on Page 40 of 140: *The Grand Ronde casino was sending food waste to a local pig farm.*

    Response: It is recommended that the Tribes conduct research to identify agricultural facilities and operations that could accept and use food waste to feed livestock, like hogs, and use the resulting compost for soil building on their farms. This recommendation has been added to Appendix F (Strategic Implementation Plan).

22. Comment on Page 40 of 140: *TSWAN and others have done trainings in proper management of kitchen grease.*

    Response: It is recommended that the Tribes identify training providers and opportunities to train kitchen workers in the proper handling and disposal of kitchen grease. This training should be provided for current employees, and a new-employee training module should be developed for new employees who will work in the kitchens. This recommendation has been added to Appendix F (Strategic Implementation Plan).

23. Comment on Page 41 of 140: *Recommend a specific recycling type dumpster with designated openings for different recyclables to avoid contamination.*

    Response: This recommendation regarding the selection of the most suitable recycling collection containers will be included in the Revised ISWMP as part of the initiative to improve solid waste management practices in the Five-County Area.

24. Comment on Page 41 of 140: *EPA SWIFR grants fund recycling equipment.*

    Response: The fact that the EPA Solid Waste Infrastructure for Recycling (SWIFR) grant program provides funding for recycling equipment will be emphasized in the Revised ISWMP.

25. Comment on Page 44 of 140: *EPA has contacts to share at Tribal casinos, restaurants who are recycling, managing food waste, etc.*

    Response: It is recommended that managers who are responsible for food services at casinos and restaurants reach out to managers at other casinos and restaurants that are successfully recycling or composting food waste to learn how it can be done for CTCLUSI. It is further recommended that a person at CTCLUSI be assigned to request contacts from EPA for this purpose and share those contacts with CTCLUSI casino and restaurant managers. This recommendation has been added to Appendix F (Strategic Implementation Plan).

26. Comment on Page 45 of 140: *EPA has examples of Tribal solid waste codes and ordinances to share.*

    Response: It is recommended that CTCLUSI Tribal Council assign a solid waste manager to lead the Tribes' solid waste management initiative. Developing Tribal codes, ordinances, and regulations for solid waste management would be among the first set of assignments for this manager. The solid waste manager should request, obtain, and use the examples provided by EPA to inform this task.

27. Comment on Page 138 of 140: *EPA and IHS have funding and technical assistance to address open dumping.*

    Response: It is recommended that CTCLUSI Tribal Council assign a solid waste manager to lead the Tribes' solid waste management initiative. Addressing open dumping should be a priority for the solid waste manager and a primary goal of the CTCLUSI initiative to improve solid waste management in the Five-County Area.

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