

OKANOGAN COUNTY

**2011  
Comprehensive Solid Waste  
and  
Moderate Risk Waste  
Management Plan**

JULY 2011



# Draft Comprehensive Solid Waste Management Plan

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## Prepared by

Okanogan County Department of Public Works and  
Hammond Collier Wade Livingstone Associates, Inc.  
83 Copple Road  
Omak, WA 98841  
Phone: (509) 826-5861 Fax: (509) 826-6039

## Okanogan County Commissioners

Andrew Lampe  
Bud Hover  
Jim DeTro

## Okanogan County Staff

Sue Christopher – Solid Waste Supervisor  
Bob Parten - PW Interim Director  
Robert Breshears – County Engineer

## Solid Waste Advisory Committee Members

Dick Howe	Solid Waste Industry
Stephen Clark	Omak
Wayne Turner	Okanogan
Chris Branch	Tonasket/Oroville
VACANT	Twisp/Winthrop
Stan Carter	At Large
Bob Clark	At Large
Mike Thurber	At Large
Pete Palmer	Colville Tribe - Solid Waste
Bass Williams	Colville Tribe - Planning
David Tonasket	Colville Tribe - Environmental Trust
Joaquin Bustamante	Colville Tribe - Recycling



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## Introduction

This Comprehensive Solid Waste Management Plan (“Plan”) describes the existing conditions, needs, alternatives, and recommendations for the management of solid waste in Okanogan County. This Plan was prepared to fulfill the requirements of state law, RCW 70.95, which requires that local governments prepare a local solid waste management plan at least once every five years. This 2011 Plan updates and supersedes any previously adopted Plan. This Plan is intended to serve as a guiding document for the 2011-2016 five-year planning period.

This Plan also includes a moderate risk waste element (Chapter II), which addresses the local hazardous waste planning requirements required of Okanogan County by RCW 70.105.220. This element supersedes any previously adopted Moderate Risk Waste Management Plan.

The region covered by this Plan includes most of the unincorporated areas of Okanogan County as well as the municipalities of:

Brewster	Pateros
Conconully	Riverside
Okanogan	Tonasket
Omak	Twisp
Oroville	Winthrop

The Confederated Colville Tribal Indian Reservation is not formally part of the planning area, as the Town of Nespelem is currently included in the Tribal Comprehensive Solid Waste Management Plan. However, solid waste collected on the Reservation is delivered to the County’s Central Landfill. Two cities in the far southeast corner of the County (Elmer City and Coulee Dam) are currently served through Grant County’s solid waste system, and are excluded from the planning area.

This Plan is organized in twelve chapters. Chapter 1 provides a review of the planning process and previous plans, and Chapter 2 provides physical and demographic data on the planning area, including population, waste generation and composition data. Chapters 3 through 12 detail various components of the solid waste management system, including waste prevention, recycling, composting, collection, waste processing, transfer, landfilling, moderate risk wastes and administration/enforcement.

In each of these chapters: the existing conditions of the waste management component are described, needs and opportunities identified, alternative solutions listed, and recommendations provided, based on suggestions provided by the County’s Solid Waste Advisory Committee (SWAC). Finally, each chapter includes a description of the implementation cost, responsibility, and timing for each recommendation.

## Overview of Okanogan County’s Solid Waste System

Okanogan County’s solid waste management system comprises a number of private and municipal collection operations. Collected waste is delivered to the County’s transfer and disposal system. The County’s system has three transfer stations and one landfill. Waste delivered to the transfer stations is transferred to the Central Landfill located directly south of the City of Okanogan. The Central Landfill is operated by the County, as well as the recycling and moderate risk waste facilities located at the landfill.

Solid waste collection is provided in Okanogan County by five firms and one municipal

operation, each serving distinct geographical areas. Collection in unincorporated areas and several cities is provided through WUTC-certificated collection companies. Other cities directly contract for either some or all collection services. The City of Oroville provides collection with municipal crews and is the only municipal operation currently in Okanogan County. The Colville Tribe provides collection services and operates a drop-box transfer system on the Colville Reservation. Solid waste collection is voluntary in most of Okanogan County.

Three transfer stations (drop-box facilities) are available to County residents and businesses. The transfer stations are located at Ellisforde (south of Oroville), in the City of Twisp, and just outside of the Town of Bridgeport in Douglas County. These three transfer stations service the outlying north, west and southern portions of the County respectively. All facilities are owned by the County, with the Twisp and Bridgeport sites operated by County personnel and the Ellisforde site privately contracted. All waste delivered to the drop-box facilities are transferred by the County to the Central Landfill. Solid waste

The Central Landfill and transfer stations serve as disposal facilities in the County. Waste may also be directly self-hauled to the Central Landfill as well as the transfer stations. The Landfill accepts municipal solid waste as well as asbestos, dead animals, infectious waste and other problem materials generated within the county. The County's moderate risk waste and recycling facilities are also located at the Landfill site. Moderate Risk Wastes (e.g. paints, pesticides, motor oil, etc.) are accepted on Saturdays throughout the year, sorted and packaged, then shipped by licensed environmental haulers to storage or treatment facilities. The recycling facility purchases or accepts a number of commodities. Materials are then sorted, baled (if needed), and shipped to markets.

The Okanogan County solid waste management system also includes administrative, enforcement, and educational components. Administrative activities performed by the Okanogan County Department of Public Works include the implementation and coordination of county ordinances (e.g. Infectious Waste); post-closure monitoring at closed County landfills; and the coordination of waste prevention and recycling education activities. City administrative activities include the management of municipal collection contracts, illegal dumping enforcement within the respective cities, and other similar functions.

Enforcement activities include permitting and monitoring activities by the Okanogan County Public Health District for solid waste sites and the enforcement of improper disposal and accumulation complaints. Cities also enforce mandatory collection requirements where required.

Educational activities for waste prevention and recycling are coordinated by the Okanogan County Department of Public Works. The Okanogan County Public Health District provides education on proper disposal through their enforcement of health regulations.

## **Summary of Recommendations**

Recommendations were developed in consultation with the Okanogan County Solid Waste Advisory Committee (SWAC) during Plan development. The SWAC reviewed recommendations, in preparation for this Plan. Plan recommendations for each waste management system component are described in Table ES-1 (Page ES-4).

In general, the Plan recommends a continuation of the existing system with

improvements to waste reduction, recycling and waste handling systems made as funding allows. The recycling system will undergo periodic review through a “recycling potential assessment” process throughout the planning period. This will allow the County to make continuous improvements as market changes and processing capabilities allow, including adding or dropping commodities and adjusting the number and location of recycling drop-off sites. The existing transfer system will be retained, with facility improvements (or additional facilities) considered as funding allows and tonnages warrant. The Central Landfill will continue to operate; at least until the 2007 cell nears capacity. Prior to reaching cell capacity, the County will review disposal alternatives and present its analysis to the SWAC about whether to continue the operation of the landfill or shift to waste export. The SWAC will review the County’s analysis and provide recommendations to the Board of County Commissioners on the most appropriate disposal option.

Table ES-1 – Summary of Recommendations

3-1	Annual Workplan	The SWAC and the County administration will annually review progress toward waste prevention and recycling goals and based on progress and grant funding availability, will develop an annual workplan to implement waste prevention programs. The workplan will review options for working with various community partners to further waste prevention and recycling within Okanogan County.
3-2	Waste Monitoring	The County will develop a tracking system to annually monitor and evaluate waste generation throughout the planning area. The tracking system will be used to determine progress toward waste prevention and recycling goals, as well as identify potential areas of concern with illegal disposal or export.
3-3	Master Composter/Recycler Programs	The County will work with local agencies, such as cooperative extension, to design and implement Master Composter and Master Recycler programs in order to train volunteers as community resources.
3-4	Financial Incentives	The County SWAC will periodically review the potential for additional financial incentives for waste prevention and recycling. The SWAC will provide recommendations to the County and cities for potential programs and policies.
4-1	Recycling Potential Assessment (RPA)	The County may perform an RPA every two years during the planning period to determine potential adjustments in County recycling programs. The results of each assessment will be reviewed with the SWAC to determine how to best implement recommended programs or adjustments in the range of materials recycled by the County.
4-2	Additional Recycling Sites	The County SWAC will work to develop additional partnerships for expanded recycling drop-off sites in under-served areas of the County. Expanded drop-off sites could include either permanent or mobile drop-off programs.
4-3	Optional Source Separated or Co-mingled Recycling	The County SWAC could work with Cities with adequate densities and access to recycling processing facilities are encouraged but not required to implement source separated or co-mingled recycling collection.
4-4	Construction/Demolition Materials	The County, with the support of the SWAC, will determine whether additional diversion alternatives are feasible for managing construction/demolition materials such as concrete, asphalt, and clean wood.
4-5	E-Waste	Additional sites and or special collection days need to be established in the Central and Eastern parts of the county.
4-6	Commercial Recycling	The County will review its recycling processing capacity to determine whether additional commercial materials can be handled at the Central Landfill recycling facility. If capacity is available, the County will encourage local haulers to provide expanded cardboard (and possibly office pack) collection, to area businesses and institutions.
4-7	Recycling Funding	The County will continue to provide support at a level of \$80,000 to \$100,000 per year to support recycling facilities and programs. The County, with assistance from the SWAC, will determine how this level of funding can be best leveraged to increase diversion during the planning period.
4-8	Market Development	The County, cities, and the Colville Nations will research and purchase recycled-content products (e.g. copy paper, tissue paper, construction materials) to the extent practical and consistent with other purchasing objectives.
5-5-13	Organic Waste & Composting	The County will continue to investigate economically feasible opportunities for organics and will keep the SWAC informed of any new processes which might be beneficial.
5-7	Yard Debris Composting	The County should partner with an external agency to instigate composting operations. If the supply of compost increases above demand the County should utilize the finished product on County properties and projects, when applicable. The County should build demonstration gardens in at least one of its parks and other locations to educate residents about the benefits of biosolids, vermin-composting and/or yard debris composting. The county should work with local garden clubs or other groups to build and maintain these gardens.

5-8-4	Food Waste Composting	Small scale vermin-composting projects should be encouraged. Home composting of food waste should be encouraged with public education on the proper methods for vermin-composting or incorporation into compost bins.
5-9-4	Composting Facilities	No Solid Waste composting facilities or programs are recommended at this time. Future proposals or opportunities should be evaluated on a case-by-case basis.
6-1	Monitor Status of Processing Technologies	The County will continue to monitor the status of processing technologies. If any technologies appear feasible, the County will inform the SWAC and pursue further investigations as appropriate. A Plan amendment will be developed, if an alternative technology is chosen as a future disposal method.
7-1	Minimum Container services and Residential Service Levels	Cities will review existing contracts and city codes to ensure that appropriate garbage service levels and incentives are available to residents and businesses that produce relatively low volumes of waste. Minimum service levels such as 20-gallon mini-cans single 32-gallon containers or once -per-month collection will be considered and implemented where appropriate. The County will work with WUTV-certificated haulers to expand service level options that encourage waste prevention and recycling.
7-2	Incentive Rate Structures	Cities and haulers will consider potential incentive rate structures when negotiating or bidding contracts for cities or filing WUTC rates. Incentive rates will be implemented, where feasible, to support waste reduction and recycling goals.
7-3	Private Roads	Haulers will work with customers to encourage appropriate road maintenance to minimize damage and wear to roads and trucks. When private roads are inadequate, haulers will collect garbage on the nearest public road.
8-1	Continue the Existing Transfer System	The County will continue to operate the Bridgeport, Ellisforde, and Twisp transfer stations. Disposal fees will continue to be uniform at both the transfer stations and the Central Landfill. Capital improvements to facilities and containers will be made, as necessary, throughout the life of the Plan.
8-2	Evaluate Additional Transfer Station	If Elmer City and Coulee Dam petition to re-enter the Okanogan County solid waste system, or if operating an additional or replacement facility to serve other populations is considered feasible, the County will evaluate the potential costs and revenues associated with operating an additional facility. The County will operate an additional transfer station only if net revenues meet or exceed the capital and operating costs of the additional facility.
8-3	Private Facilities	Private, municipal, and tribal transfer stations are allowed, provided that: (1) they meet all land use, health district, and other agency permitting requirements; (2) they do not detract from the financial viability of the County transfer system; and (3) all collected MSW is delivered to the Central Landfill or other facility designated by the County.
9-1	Continue Post-Closure Monitoring	The County will continue post-closure monitoring of the closed Okanogan, Twisp, Ellisforde, and Pateros landfills.
9-2	Continue Near-Term Operation of Central Landfill	The County will continue to operate the Central Landfill as the sole disposal facility within the planning area. The County will comply with the Conditional Use Permits and landfill Plan of Operations, as either is amended from time to time, and report annual progress to the SWAC.
9-3	Waste Import	The County will consider importing waste from neighboring counties if it is in the County's interest to do so. The importation of Municipal Solid Waste from Chelan, Douglas, Grant, or Ferry Counties will be specifically permitted without a Plan amendment, provided that such import is allowed under the Central Landfill's Conditional Use Permit and Operating Permits, as revised from time to time. In the event that importation appears desirable, the County will review specific costs and benefits with the SWAC.

9-4	Waste Export	If the County determines that waste export is advisable once Central Landfill Cell #2B is filled, the Central Landfill or an alternative site will be used as an export transfer station. County MSW will then be transported and disposed at an out-of-county landfill. This Plan specifically allows the export of waste from a future County transfer facility, if that disposal method is chosen (see Recommendation 9-5). If waste export is chosen as a future disposal method, the existing Central Landfill may be retained as an inactive but not fully closed facility to provide local back-up for the export arrangement.
9-5	Future Disposal	The County will conduct a comparison of disposal costs at the Central Landfill with an alternative operation of a transfer/export system to other regional landfills two years prior to the expected filling of Cell #3A. The comparison will be brought before the SWAC for review. If waste export appears to meet cost, reliability, management control, and other County and SWAC objectives, the County will proceed with a Request For Proposal to determine actual system costs. The County will then either proceed with negotiations to contract a waste export system or develop Cell #3A at the Central Landfill.
10-1	PCS Acceptance and Remediation	The County will continue and enhance monitoring contaminated soil deliveries at the Central Landfill to ensure that maximum contamination levels are not exceeded for material directly used as landfill cover. The County will investigate the feasibility of establishing a PCS remediation area at the Central Landfill. If feasible and cost effective, the County will develop a remediation site, with the remediated soil used as landfill cover.
10-2	Infectious Waste	The County will periodically monitor incoming solid waste at transfer stations and the Central Landfill to determine the presence of infectious waste. If significant quantities are observed, the source will be determined and the County will inform the generator of the need to handle infectious waste separately to limit worker exposure to infectious wastes and sharps. If continuing quantities of infectious waste are noted in incoming solid waste, the County will work with local health care and professional organizations to provide notification of proper disposal methods for infectious waste.
10-3	Tire Management	The County will periodically investigate alternative tire management methods to determine whether additional in-county reuse or recycling might be possible. If feasible and cost-effective, the County will support in-county tire reuse and recycling alternatives.
10-4	White Goods	The County will investigate the financial and operational impacts of offering discounts, city-sponsored collection events, amnesty days or other methods to divert white goods from illegal dumping or improper accumulation. If feasible, the County (and cities) will proceed with recycling incentives for white goods.
10-5	Asbestos	The County will periodically monitor incoming solid waste at transfer stations and the Central Landfill to determine the presence of asbestos. If significant quantities are observed, the source will be determined (if possible) and the County will inform the generator of appropriate disposal methods.
II-1	Continue Moderate Risk Waste (MRW) Facility at Central Landfill.	The County will continue to provide a MRW facility at the Central Landfill or successor disposal facility. The MRW facility will be open at least one day per week and will accept materials from households and conditionally-exempt small quantity generators. The facility may be open additional days or sites each week, as staffing and funding allow. Collected materials will be reused or shipped via regulated haulers to treatment, recycling or disposal facilities.

II-2	MRW Promotion and Education.	The County will continue to provide MRW reduction, recycling and disposal promotion and education as part of its overall solid waste program. Promotion and education programs will be tailored to address specific topics and reminders on a rotating basis throughout the planning period. Examples of topics include MRW facility availability and acceptance policies, proper motor oil management, battery recycling, and electronics reuse and recycling.
II-3	MRW Reuse.	The County will investigate the legal and operational issues related to providing a reuse area at the MRW facility for appropriate materials. If feasible, the County will allow the reuse of certain MRW materials such as oil-based paint, automotive products and household chemicals. Extremely hazardous wastes and banned materials (e.g. DDT, penta preservatives, etc.) will not be allowed for reuse and will be disposed as MRW.
II-4	Lead-Acid Battery Recycling.	The County will work with the jurisdictional Health District to determine the feasibility of accepting lead-acid batteries at transfer stations. If feasible, the County will accept lead-acid batteries at transfer stations.
II-5	Electronics Recycling	The County will investigate the feasibility of accepting electronic equipment as a recyclable material at the Central Landfill. If feasible, a fee would be charged to cover the costs of recycling the components.
II-6	Business Technical Assistance	In the event that Ecology business technical assistance programs are no longer available to Okanogan County generators, the County will solicit and compile a list of environmental consultants to provide those services to generators.
12-1	Cities Participation	The Cities within the Planning Area–Brewster, Conconully, Okanogan, Omak, Oroville, Pateros, Riverside, Tonasket, Twisp, and Winthrop–will continue to be part of the Okanogan County solid waste management system and will maintain compliance with the provisions of interlocal agreements.
12-2	City Management	Cities will continue to manage their solid waste collection programs and municipal ordinances. The County may provide technical assistance workshops to member cities as interest, staff time, and funding allow.
12-3	The Okanogan County Public Health District’s Role	The County Public Health District’s Environmental Health Division will continue to enforce solid waste handling practices throughout the County. These activities include monitoring and permitting solid waste facilities and transfer stations. When local concerns dictate, the Health Department will adopt local regulations for solid waste management facilities.
12-4	The Okanogan County Solid Waste Advisory Committee’s Role	The Okanogan County Solid Waste Advisory Committee will continue to review and provide comment on County policies and programs related to solid waste management, including reviewing periodic recycling potential assessments, disposal option planning and a periodic review of this Plan. County staff will provide support to the SWAC, as appropriate.
12-5	Public Works Department Coordination and Management	The County Public Works Department will continue to provide coordination and management of the County solid waste management system. These activities include post-closure monitoring at former landfills, operation of transfer sites and central disposal site, the implementation of County ordinances (including Collection and Disposal Districts, if enacted), waste prevention and recycling programs, and moderate risk waste programs.
12-6	System Funding	The County will continue to use disposal tipping fees to fund the solid waste system to the extent practical. The County will consider and implement Disposal and Collection Districts or other funding mechanisms if future events result in a need to reduce tipping fees and recapture lost revenue through direct taxation of parcels or collection services.



**Chapter  
1****Introduction  
and  
Review**

Okanogan County solid waste<sup>1</sup> planning and development has progressed through several significant stages over the past 36 years. Regulatory requirements and shifting public attitudes have led to increasingly intensive management of wastes during this period. This 2011 update of the Comprehensive Solid Waste Management Plan (the Plan) will provide the next step in continuing to meet the waste management needs of the diverse population and extensive geographical setting of Okanogan County.

As a result of previous planning processes, Okanogan County has progressed from uncontrolled dumping to the development of regional transfer stations and a central landfill, as well as steadily increasing levels of diversion through waste reduction and recycling.

The 2011 Plan accomplishes the following:

- Identifies goals and strategies for improved waste reduction, recycling management, waste disposal, and moderate risk and hazardous waste management.
- Reviews the existing waste management system and provides recommendations for program improvements during the planning period.
- Addresses key decisions that will need to be made during the planning period and establishes an orderly process for making those decisions.
- Recommends program of action taken by Okanogan County; Board of Commissioners, Public Health, Board of Health, and the staff of the Public Works Department.

This Plan is the result of intensive work by Okanogan County's Solid Waste Advisory Committee (SWAC), which is made up of representatives from the various stakeholders within the County. These stakeholders include representatives from the County's incorporated municipalities, Colville Tribes, waste hauling industry, local businesses, and the public at large. Additionally, coordination with County and Cities' staff, adjacent counties, and the Department of Ecology has also assisted in developing a Plan that is compatible and supports regional efforts.

Public participation by municipalities, stakeholders, and citizens was solicited at several points through the Plan development process. Public involvement is discussed further in Section 1.5.3 of this chapter.

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<sup>1</sup> Solid waste includes materials commonly considered as "garbage" as well as certain manufacturing and agricultural wastes, and other non-liquid wastes authorized by the current operations permit.

## 1.1 Local Governments Included in the Plan

### 1.1.1 Municipalities

Okanogan County, as lead agency for solid waste management in the planning area, is responsible for developing a coordinated county-wide solid waste management plan. Provisions of State law require incorporated municipalities to participate in this plan development or to develop their own independent plan. Okanogan County and these municipalities have shared in solid waste planning since 1971. To support efficient regional delivery of services, and avoid the costs of establishing a separate solid waste management system, most of the incorporated towns and cities have opted to participate in this Plan Update. The participating municipalities include:

- Brewster            Conconully            Okanogan            Omak
- Oroville            Pateros                Riverside
- Tonasket           Twisp                    Winthrop

During the preliminary stages of Plan research and preparation, the majority of the municipalities within Okanogan County elected to be part of the County's Plan. Due to geographic constraints and existing alternative arrangements, the Towns of Coulee Dam and Elmer City did not participate in this Plan, and instead will continue to use facilities in Grant County pursuant to Grant County's Plan.

Participating municipalities adopted this plan through their formal legislative process. Interlocal agreements were executed to support Plan recommendations (Copies of Interlocal agreements are provided in Appendix A). In accordance with this Plan and the supporting interlocal agreements, solid waste collected within participating municipalities and by Washington Utilities and Transportation Commission (WUTC)-certificated haulers serving unincorporated areas shall be taken to an Okanogan County transfer station or landfill, unless otherwise provided by interlocal agreement with neighboring counties.

Incorporated cities and towns have the authority to:

- Enact ordinances governing waste handling within their jurisdictions.
- Contract for waste and recyclable collection services.
- Enter into interlocal agreements with other jurisdictions, provided that those ordinances and agreements comply with this Plan and the supporting interlocal agreements between the cities and the County.

The municipalities' choices are discussed more fully under the specific waste handling and recycling elements of the Plan.

### 1.1.2 Colville Confederated Tribes

The Colville Confederated Tribes (the Tribes) participated in the planning process via SWAC membership. Okanogan County serves the western portion and Ferry County serves the eastern portion of the Colville Indian Reservation. The Tribes operate a collection and drop-box transfer system which serves residents and businesses on the Reservation. The Okanogan County portion of the Reservation uses the County's Central Landfill. The Tribes maintain jurisdiction through their Solid Waste Comprehensive Management Plan, over waste management regulations, practices, and financing within the Reservation boundary. Nespelem and portions of Omak, Okanogan and Coulee Dam are within the boundaries of the Colville Indian Reservation.

### 1.1.3 Adjacent Counties

Okanogan County has cooperative interactions with adjacent counties to provide waste handling facilities and manage overlapping jurisdictions of the WUTC certificated waste haulers. The following review outlines the existing relationships.

#### Douglas County

Okanogan County owns a drop-box transfer station near the Town of Bridgeport in Douglas County, located at the site of the now closed Bridgeport Bar landfill. Okanogan and Douglas Counties closed the landfill and Okanogan County constructed the transfer facility on land owned by Okanogan County with assistance from Douglas County. The site is administered and operated by Okanogan County. Since January 1994, waste has been transferred to the Central Landfill. Residents and commercial haulers in the Columbia River region of northern Douglas County and southwestern Okanogan County use the Bridgeport Bar transfer station.

#### Chelan County

The WUTC certificated waste hauler operating in the unincorporated areas of southwest Okanogan County holds a certificate for an area that includes parts of Chelan, Douglas, and Okanogan Counties. No other interaction with Chelan County has evolved, because the population centers are widely separated and no official interest in joint action has resulted from contact between the counties' legislative authorities.

### 1.1.4 Okanogan County Waste Management Programs and Responsibilities

Okanogan County provides for solid waste management and disposal through the legislative and contractual powers of the Board of County Commissioners. The Okanogan County Public Health (Public Health) provides monitoring and enforcement of State and County laws and regulations on waste management. The administrative aspects of the solid waste programs are assigned to various County departments.

A brief outline of departmental programs and responsibilities is presented in this section and general requirements of state laws and regulations that are met by these activities. These topics are described below in greater detail in the relevant chapters.

#### Okanogan County Board of Commissioners

The Okanogan County Board of Commissioners (the Board) is the County's legislative authority for all aspects of the solid waste program, except for collection and regulatory aspects handled by the Public Health. The Board receives recommendations from County departments, the SWAC, and the public about programs, budgets, and ordinances. Board decisions are supported by: information provided by departmental staff; developed through the environmental review process; recommendations of the SWAC; and citizen comment at public hearings or meetings.

#### Public Works Department

The Public Works Department has been assigned overall responsibility for planning, development, operation, and administration of the solid waste program in the County. The Public Works Department carries out these assignments by accomplishing the following tasks for waste reduction, recycling, and disposal functions:

**Table 1-1. Okanogan County Public Works Solid Waste Functions**

<b>Task</b>	<b>Assignment</b>
Planning	Lead agency to develop this Plan
Budgeting	Prepare annual capital and operating budget; ensure sufficient reserves
Development	Prepare engineering and construction documents; administers bidding and contracting, and construction inspection
Operations	Operate County solid waste facilities, including the Central Landfill, transfer stations, moderate risk waste facility, and recycling center
Financing	Perform rate studies as needed to recover costs; secure grant funding as available
Administration	Maintain records on system operations; ensure regulatory compliance
Legislative	Draft solid waste ordinances and policies for Board review and adoption

### Okanogan County Public Health (OCPH)

OCPH is the jurisdictional health agency that has the responsibility to enforce the provisions of State law through local health ordinances and policies. The Board of Health, which is composed of the three County Commissioners and representatives from the cities, provides legislative oversight of OCPH.

The OCPH staff reviews and issues solid waste facility permits, monitors operations, and enforces regulations concerning facility operations in accordance with the state-mandated Minimum Functional Standards for Solid Waste Handling (see WAC 173-304, WAC 173-350 and WAC 173-351). These regulations establish minimum performance standards for the proper handling of all solid waste materials, and identify those functions necessary to ensure effective solid waste handling programs at both the state and local level.

OCPH staff also enforces state and local regulations concerning public waste disposal practices and illegal dumping. OCPH is an active participant in the planning process, sitting in as non-voting, technical advisors to the SWAC.

### County Office of Planning and Development (OCPD)

The OCPD is responsible for implementing and administering County adopted plans and regulations, and is the lead agency for the State Environmental Policy Act (SEPA) for facilities and development. All proposed solid waste development projects are reviewed under SEPA and are processed by the Planning Department.

### County Prosecutor

The County Prosecutor's Office serves as legal counsel for the Board and County departments, providing legal advice, statute interpretation and representation during contractual disputes. The Prosecutor's role is to bring legal action against persons charged with violating state or local laws. As such, violations concerning illegal dumping or other illegal waste handling practices must be brought to the prosecutor by Okanogan county Public Health staff or the Sheriff's office.

## 1.1.5 County and Municipal Responsibilities for a Coordinated Solid Waste System

Development and operation of a county-wide solid waste management system depends on cooperative interactions between the participating incorporated municipalities and Okanogan County. This cooperative relationship is defined through:

- Interlocal agreements between the individual municipalities and Okanogan County that were formulated and adopted during Plan adoption (see Appendix A).
- Participation through municipal representatives from the SWAC.
- Participation in adopting the OCPH Solid Waste Handling Ordinance provisions.

It is through these mechanisms that Okanogan County, acting as lead agency and on behalf of the municipalities, provides solid waste facilities and programs.

It is Okanogan County's responsibility to lead planning efforts, make provisions for construction and operation of the system's components, adopt budgets, set rates, and maintain permits for operating facilities. These actions are taken pursuant to the adopted Plan, and many are subject to review and recommendations by the SWAC, citizen review and comments at public hearings.

Municipalities, as participants in the county-wide system, support the adopted Plan by entering into interlocal agreements with the County. These interlocal agreements require the towns and cities to use and the County to provide regional solid waste facilities. Wastes generated by municipalities and directed to these regional County facilities comprise the majority of disposal system's funding. Disposal fees, along with a limited amount of state matching grants, provide funds for debt retirement, capital improvements and operational costs.

Okanogan County is also responsible for developing and operating county-wide recycling and waste reduction elements of the Solid Waste Management Plan. These programs are dependent upon the financial support primarily from disposal fees, occasional state grants and revenues from materials sales.

## 1.2 Relationship to Other Plans

The 2010 Plan Update is the fifth successive Comprehensive Solid Waste Plan for Okanogan County. The history of this Plan is described in Section 1.3 of this chapter. Its relationship to other County comprehensive plans is outlined below.

### Moderate Risk Waste Plan

At the time this Plan was written, the solid waste management system was governed by the 2004 Comprehensive Solid Waste and Moderate Risk Waste Management Plan adopted in September of 2005. Both aspects of the solid waste management system were incorporated into this plan, thus eliminating the need for a separate moderate risk waste plan.

### Comprehensive Land Use Plan

The County's zoning and subdivision ordinances are based on policies adopted in the comprehensive Plan. Land use provisions in the plan govern land use decisions, which may affect the siting of waste management facilities. The comprehensive land use plan was adopted in 1964, with later amendments for portions of the Methow Valley and the Barnholt Loop area, south of Okanogan. The County is currently (2010) in the process of reviewing and updating the County's comprehensive land use plan.

Other plans within Okanogan County address recreation and trails, road development, wildlife, ground water quality, and open space. These plans have little relationship to waste management issues due to their limited geographical coverage, but would be

referred to when relevant in any feasibility study or SEPA document prepared for the proposed facilities.

### **1.3 Solid Waste Planning History in Okanogan County**

In 1969, State legislation granted counties primary authority for the planning and regulation of solid waste handling and disposal. Okanogan County developed its initial plan in 1971, with an addendum in 1976. The plan was completely updated in 1984, and again updated in 1993. The significant elements of each plan and the record of completion is described below.

#### **1971 Solid Waste Plan**

The major recommendation from the 1971 Plan was to close several local dumps, establish eight regional drop-box transfer stations and to develop a central sanitary landfill at Omak. In addition, the County would operate a system of 68 publicly owned and operated waste container sites. Funding for development and operation would have come through the formation of a county-wide solid waste management district.

Other recommendations included forming a Public Works Department, appointing a Utilities Director within the Department, and assigning the Health Department as the authority responsible for enforcing waste management ordinances.

Due to the high cost of developing and operating the extensive drop-box transfer and rural collection box system the plan was never implemented as presented. Collection of wastes was left to the individual, either to subscribe to a collection service or to haul wastes to an authorized landfill. A Public Works Department under the County Roads Engineer was formed to develop a solid waste disposal system, among many other projects.

#### **1976 Addendum**

The adopted revisions included leaving the collection of wastes to WUTC-certificated haulers, closure of the local dumps used by 11 small towns and unincorporated communities, and upgrading the existing dumps to sanitary landfill classification at Ellisforde, Omak, Twisp, Pateros, Riverside, Bridgeport, and Loomis. Provisions for acquiring new landfill sites at Ellisforde, Omak/Okanogan, and Twisp were included in the plan. Establishment of a permit system and enforcement by the Health Department were again recommended.

The acquisition and development of new landfills at Okanogan and Ellisforde proceeded as planned. The Bridgeport Bar and Twisp disposal sites were upgraded to landfills. Sporadic improvements in covering, burning reduction, and auto hulk accumulation were made at most of the smaller sites. By the time of the 1984 Plan Update, the sites at Brewster and Riverside were closed. The leased site at Twisp continued to operate due to lack of community acceptance of a replacement landfill site.

#### **1984 Update**

Major recommendations included:

- Closing landfills at Twisp and Bridgeport Bar, and replacing them with drop-box transfer stations.
- Relocating and replacing the landfill serving the Omak/Okanogan area and designating it as the disposal site for wastes from the transfer stations at Twisp, Bridgeport Bar, and Ellisforde.

- Closing the landfill at Ellisforde and installing a transfer station.
- Closing and restoring roadside dumping areas.
- Starting discussions with the Colville Confederated Tribes in order to establish a cooperative waste management agreement for joint use of a disposal site to serve the eastern portion of the reservation.
- Working with certificated haulers to establish collection service in areas not currently served.
- Locating waste bins at County recreation sites and working cooperatively with the Game Department for service at state recreation access points.

Program development recommendations included:

- Revising the county solid waste ordinance in order to conform to recently adopted state regulations, and in order to address several local needs.
- Establishing a staff position in the Health Department whose duties include: developing information on hazardous waste; developing an emergency response plan; and surveying generators to determine the need for a transfer or storage facility for hazardous wastes.
- Deputizing Health Department staff in order to make them capable to directly cite persons for illegal dumping and littering.
- Reviewing landfill disposal sites' compliance with current regulations at Loomis, Pateros, and Nespelem.
- Enhancing recycling opportunities by providing facilities for collecting and storing materials at disposal sites; by distributing information materials; and by requesting proposals from the private sector for public/private recycling operations.
- Reviewing potential markets for an energy/resource recovery system.

Administrative action recommendations included:

- Developing interlocal agreements with Omak/Okanogan, Douglas County, and the Tribes.
- Continued funding of the system by user fees.
- Establishing consistent data reporting.
- Distributing public information.

Most significant aspects of the 1984 Plan Update recommendations were implemented or have continued forward as planned activities. These aspects included:

- The Twisp, Bridgeport Bar, and Ellisforde landfills were replaced with transfer stations.
- The Okanogan landfill was closed and a Central landfill site was developed.
- Many roadside dumping areas were closed and restored.
- Disposal sites at Pateros and Loomis were closed, and collection services were extended to the Molson/Chesaw area.
- Use of the Okanogan landfill by the Tribes in conjunction with Tribal operation of their existing collection and transfer system was established.

Recommendations concerning hazardous waste were implemented statewide by the Department of Ecology and at the local level by development of the 1993 MRW Management Plan.

Recycling enhancement recommendations resulted in the construction of storage buildings at the new transfer stations and the development of an operating agreement with a local business to establish and operate a public recycling buy-back facility serving the Omak/Okanogan area.

Some plan recommendations were not implemented. Enforcement against illegal dumping has been handled without deputizing Health District personnel.

### 1993 Plan Update

Major recommendations included completing the two major 1984 Plan activities: designing and building the Central Landfill, and closing the Okanogan and Ellisforde landfills.

Other disposal-related recommendations included:

- Continuing post-closure monitoring.
- Establishing special waste areas at the Central Landfill.
- Refining rate structures.

Waste reduction and recycling recommendations included:

- Promotion and education activities.
- Enhancing buy-back and drop-off activities.
- Pursuing yard waste composting.
- Coordinating residential and commercial on-site collection.
- Continued monitoring.
- Establishing preferential purchasing for recycled materials.

All of the disposal-related recommendations of the 1993 Plan have been implemented, and some of the waste reduction/recycling activities have been implemented. The County developed a recycling facility at the Central Landfill for self-haulers. Curbside recycling is not currently available in Okanogan County. A newly expanded drop-off recycling program, located at the Twisp transfer station, has been developed for the western portion of the County. No formal composting programs have been established for yardwaste and no preferential purchasing policies for recycled material have been developed. Figure 1-1 shows the locations of the various solid waste facilities discussed in this Plan.

### 2004 Update

The 2004 Update described the existing conditions, needs, alternatives, and made recommendations for the management of solid waste in Okanogan County. The plan fulfilled the requirements of the then current RCW and was intended to serve as a guiding document for the 2004-2008 five-year planning period. The 2004 Update superseded the previously adopted 1993 Plan.

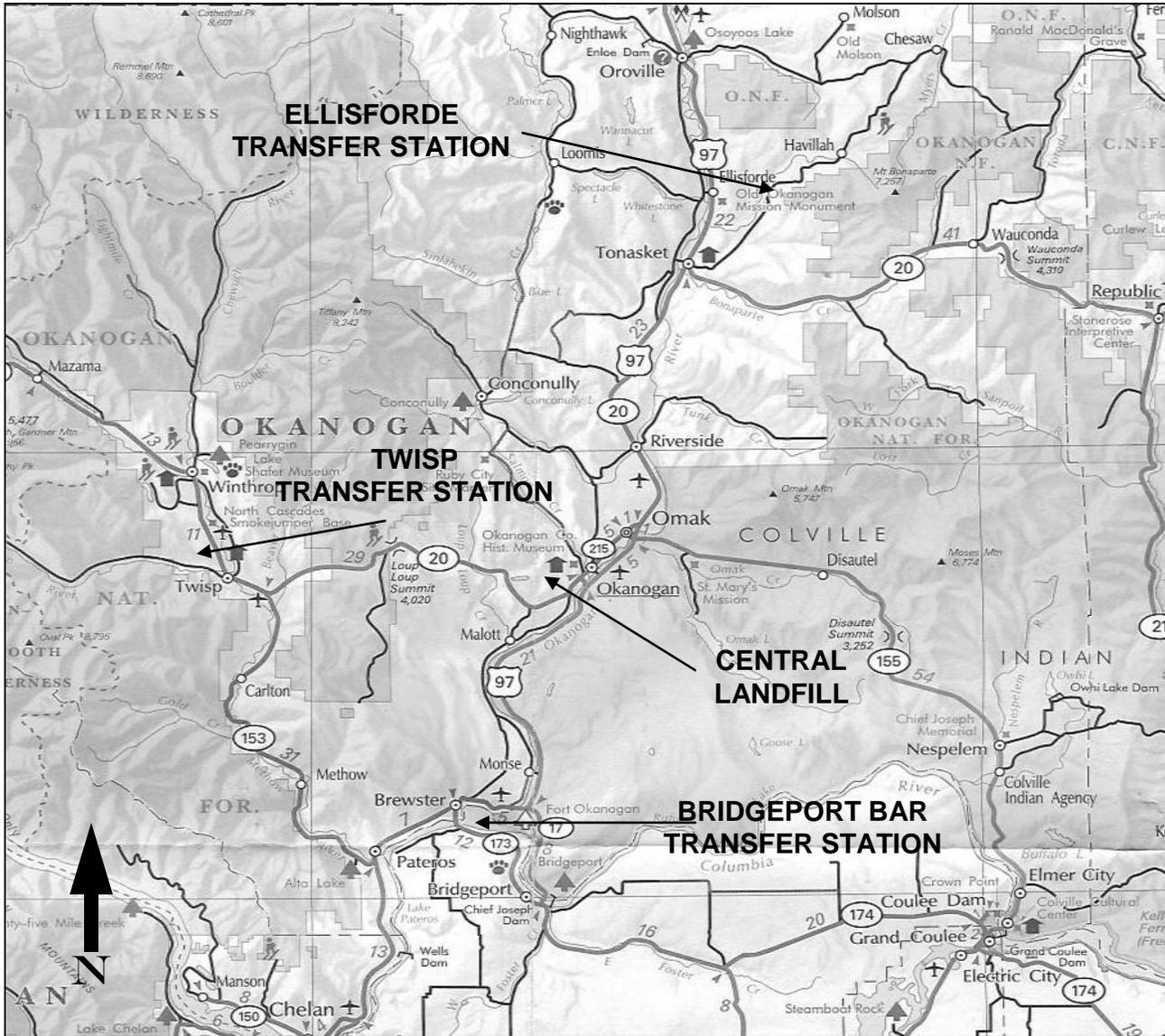
The 2004 Update also included a moderate risk waste element (Chapter 10), which addressed the local hazardous waste planning requirements of RCW 70.105.220. That element superseded the County's prior Moderate Risk Waste Management Plan previously adopted in 1993.

The region covered by the 2004 Update includes most of the unincorporated areas of Okanogan County as well as most of the incorporated municipalities and portions of the Colville Indian Reservation.

The 2004 Update contained the following elements:

- Reviewed the planning process and previous plans
- Provided planning area physical and demographic data
- Detail various components of the solid waste management system describing needs, alternative solutions and recommendations.
  - Waste prevention, recycling, collection, waste processing, transfer, landfilling, moderate risk wastes, administration, and enforcement
- Overview of Okanogan County's Solid Waste System
  - Facilities – Central Landfill and Transfer Stations
- Participation, input and approval by Washington State Department of Ecology and Utilities & Transportation Commission
- Summary of Recommendations on the following:
  - Annual work plan, Waste and Post-Closure Monitoring, Current and Expanded recycling program, Private Roads Haulers, Existing & Future Transfer System, Special Wastes, Private Facilities, Waste Import and Export, Moderate Risk Waste(MRW) Program, Business Technical Assistance, Cities Participation, Okanogan County Health District's Role, Okanogan County Solid Waste Advisory Committee's Role, Public Works Department Coordination and Management, System Funding

# OKANOGAN COUNTY



## Disposal Facilities Locations

FIGURE 1.1

## 1.4 Goals and Objectives of the Solid Waste Plan

This Plan continues and expands the goals and objectives adopted by the previous 1993 Plan. During the development of this Plan, the Solid Waste Advisory Committee reviewed the existing goals and objectives, and recommended to retain the 1993 provisions, with some revisions.

### 1.4.1 Solid Waste Plan Purposes and Functions

The purposes of the Plan are to:

- Adopt concise statements of goals and objectives.
- Provide information on statutes and regulations, current local waste management practices, and applicable alternatives.
- Develop estimated capital and operating costs for the recommended system.
- Schedule necessary steps to create legislative, financial, and physical elements of the recommended system.
- Provide legal authority under State law for the Health District and others to issue facility permits and provide statutory regulation.
- Provide an approved Plan to maintain eligibility for State and other grant assistance.

### 1.4.2 Okanogan County Goals and Objectives

Okanogan County seeks to develop an integrated waste management system which influences individual waste generation practices while providing for necessary and economically efficient waste management services that minimize environmental impacts and protect human health.

The waste management system shall be based on the following objectives and policies:

- Further waste reduction and recycling programs to reduce waste generation and associated handling and disposal requirements, while minimizing costs.
- Support appropriate state and local legislation and practices that reduce waste generation and/or enhance recycling opportunities.
- Continue development of the existing solid waste handling system to provide needed services and to assure conformance with state and local regulations.
- Make use of private sector capabilities as service providers, when appropriate and cost effective, to accomplish some operating aspects of the program.
- Coordinate with other jurisdictions to maximize public service coverage and efficiency.
- Maintain and improve the monitoring of waste generation and disposal activities
- Support improvement of the solid waste management system
- Enforce applicable regulations.

These policies are established to guide consideration and development of recommendations throughout the chapters that deal with various waste management system elements.

### **1.4.3 Solid Waste Plan Revision Procedures**

Solid Waste Management Plans should be reviewed and updated every five (5) years. Revision of the Plan may become desirable prior to the intended schedule if unforeseen events require a re-evaluation of solid waste programs or facilities.

Grant assistance, site operating permits, and waste disposal site designations for Plan participants must conform to the Plan. The following procedure should be followed in order to formalize the request for consideration and adoption of proposed new elements within this Plan:

- Any request for a revision to the Solid Waste Management Plan is directed to the Board of County Commissioners for referral to the SWAC, and any participating city or town.
- Requested Plan changes and their impacts on the present system are developed by the proponent and may include: impacts on waste volumes at facilities affected; financial impacts of construction and operation; how the proposed change conforms to legal requirements; how the proposal is to be financed; and the proposed timing of implementation.
- The general public and all affected jurisdictions, including the OCPH and any cities or adjacent counties, are notified of the SWAC meeting dates when the proposal is to be discussed or considered by the SWAC.
- SWAC recommendations are forwarded to the affected jurisdictions and to the Board of County Commissioners.
- A review of Plan amendment under the State Environmental Policy Act (SEPA) is performed, if appropriate.
- The Department of Ecology reviews the Plan to verify conformance with the State Solid Waste Planning Guidelines and state regulations.
- Adoption of the Plan amendment is made by the Board of County Commissioners and affected jurisdictions.

The amendments may be proposed by private sector interests, participating jurisdictions, or jurisdictions outside Okanogan County

### **1.4.4 Solid Waste Advisory Committee Roles and Procedures**

Pursuant to State law, RCW 70.95.165(3), each county shall establish a local solid waste advisory committee (SWAC). The SWAC assists in the development of programs and policies concerning solid waste handling and disposal and reviews and comments on proposed rules, policies, or ordinances prior to their adoption. The committee shall have, at a minimum, nine members that represent a balance of interests, including, citizens, public interest groups, business, the waste management industry, and local elected public officials.

SWAC roles are designated in the Solid Waste Planning Guidelines. The Guidelines also state that the Plan must specify the procedures and operations of the local SWAC.

County SWACs are to be ongoing committees, with meetings to be held at least four times per year during development of a comprehensive plan, and at least twice a year otherwise. Notice to the media is to be given, stating the SWAC meeting times.

The SWAC operates under bylaws adopted by the Committee, elects its own chairman, and has a regular rotation of new members appointed by the Board of Commissioners. The Public Works Department provides staff support to the SWAC, including meeting arrangements, minutes and agenda preparation, supplemental information, and may also provide financial support for attendance at relevant conferences and seminars.

The primary function of the SWAC is to review all significant policy and program development issues, and recommend a position to the Board of Commissioners and Board of Health. Specific documents to be submitted for SWAC review prior to action by the Board include:

- The Comprehensive Solid Waste Management Plan and Plan amendments.
- Proposed changes of the County regulations on solid waste handling and of the Board of Health regulations relating to solid waste.
- Annual budgets and work plans that are related to the implementation of current Plan recommendations.
- Rates and rate revisions concerning solid and moderate risk wastes.
- Annual operating data concerning solid and moderate risk waste diversion, recycling, and disposal.

In Okanogan County SWAC meetings are usually held monthly (unless there is a lack of agenda items), on the first Monday of the month, at a location to be determined each month at the discretion of the committee. Meeting notices are provided to the media and the public is encouraged to attend and participate.

### **1.4.5 Plan Development and Public Participation**

This Plan was made possible by a number of participants and was funded entirely by Okanogan County Department of Public Works Solid Waste Division. The Okanogan County Public Works Department was the lead agency during development of the Plan and the SWAC was instrumental in providing periodic review and comments.

Okanogan County's SWAC represents a variety of interests including citizens, local jurisdictions, recycling and environmental interests, the solid waste industry, and local business. The SWAC helped establish the Plan's goals, reviewed preliminary drafts of the Plan's chapters, commented on them, and assisted with the evaluation of the alternatives. The SWAC also participated in updating the draft and final plan before its adoption by the local jurisdictions.

Okanogan County and most of the incorporated municipalities within its borders have worked cooperatively to develop this Comprehensive Solid Waste Management Plan. Participants have included Okanogan County and the municipalities of Brewster, Condonully, Okanogan, Omak, Oroville, Pateros, Riverside, Tonasket, Twisp, and Winthrop.

Officials from each city and other stakeholders were contacted at the start of the Plan development process to inform them about the planning process, invite them to participate in the process, and to discover key issues to address in this Plan. SWAC-reviewed chapters were mailed or e-mailed to each City and the Tribes, and comments

were encouraged during the chapter review process, as well as when all of the chapters were integrated into the preliminary draft Plan.

Various local and state agencies also participated in Plan development through comments, suggestions, and review of the Plan from the initial planning stages through final Plan adoption. News releases encouraged public participation at the SWAC meetings. The public involvement strategy used to develop this Plan is included as Appendix B.

A public meeting was held November 1, 2011 in the Board of County Commissioners Hearing Room in Okanogan to receive comments on the draft Plan.

Comments on the Draft Plan were received from Ecology and the Washington Utilities and Transportation Commission. Those comments and a summary of responses are provided in Appendix C. The SEPA Checklist is provided in Appendix D.

**Chapter  
2****Background  
of the  
Planning Area**

This chapter provides background on the elements of the natural, human, and economic environment which affect waste management in Okanogan County. Included are summaries of current and projected populations and waste quantities, as well as a review of the composition of waste disposed at County disposal facilities.

**2.1 Natural Environment**

Okanogan County, geographically, is Washington State's largest county and has wide climatic, topographic, and geologic diversity. Population centers, and hence waste generation, occur primarily in the lowland valleys. These are semi-arid areas, which are located on river bottom and terraced topography, and are characterized by alluvial and glacial sedimentary geology. These are also the areas where important surface and ground water resources are accessible and subject to impacts from human activities. The lowland areas also provide important seasonal habitats for many wildlife species in Okanogan County.

Immediately adjacent to these populated corridors are steep, rocky, and mountainous upland areas characterized by igneous and metamorphic rock formations. These areas typically have little or no soil deposition, steep slopes that prevent most forms of land development, and higher annual precipitation than the surrounding lowland areas.

**2.1.1 Climate**

Precipitation is the dominant climatic factor in the populated areas. Precipitation is generally low (8 to 14 inches annually). A high percentage of the precipitation occurs as snowfall in winter. Occasional significant runoff events are caused by rapid snow melt and summer storms. Sustained high temperatures in the summer (90°-100° F in daytime) and lows in the winter (successive days of below zero, with dips to -30° F) create periodic operational problems for waste management activities. Waste collection, transfer station operation, transfer hauling, and landfill operation must take these climatic factors into account in design and operation. The relatively low precipitation and its seasonal distribution are favorable for avoiding leachate production and potential ground water contamination. Snow accumulation can make transfer and landfill operations challenging, as well as impact curbside collections of waste or recyclables. Design and operation of sludge drying, land application of sludge, and potential composting operations need to account for these climatic factors. The addition of a water supply to the current landfill location will create the ability for development of services.

## 2.1.2 Topography and Geology

Topography and geology have the greatest impacts on selection, design and operation of landfill sites. This is discussed in more detail in Section 8.1.5, which addresses landfill-siting criteria. Potential landfill areas are characterized by gentle slopes, adequate soil deposition, and reasonable access to the road system. These areas are usually associated with human settlement, irrigated or non-irrigated agricultural development, high ground water tables, or proximity to surface water resources. These factors, in addition to the statutory siting criteria, severely limit potential locations for landfill sites.

## 2.2 Built Environment

### 2.2.1 Transportation

The transportation network is the most significant element of the built environment in developing the County's waste management system. The network of roads and highways is extensive and well developed in most of the populated areas. Connection between population centers is via state highway routes in all cases except for the widely dispersed populations of Chesaw, Molson, Havillah, Loomis, and Conconully. Bridges or other weight limitations restricting collection or transfer operations are nonexistent on State routes in the County. Winter maintenance on these State routes is adequate to avoid disruptions, except for occasional extreme conditions when travel is unsafe for any purposes.

The small communities previously mentioned, as well as the majority of the rural residential areas served by collection service are served by the County road system. These roads are generally excellent, typically have no limiting bridge weight restrictions, and are maintained in winter according to a priority schedule that accommodates waste facility operation and most needs of waste collection routes. Temporary restrictions on size, weight or speed may be imposed on portions of the County road system for vehicles that could cause damage to the roads due to climatic or other conditions.

Air traffic facilities include airports at Omak and Okanogan, with lesser airstrips at Brewster, Twisp, Winthrop, Tonasket, and Oroville. These facilities are significant to waste management only in that they require specified separation from waste disposal facilities according to FAA guidelines and State siting criteria.

Active rail service extends the length of the Okanogan River from Canada to the Columbia River and areas south. Rail has not historically been a factor in waste management until recent proposals in other jurisdictions for long-haul transport to distant landfills.

### 2.2.2 Utilities

Electrical power distribution networks traverse many of the same river bottoms and adjacent terraced lands discussed above, limiting development of landfill disposal sites. Local electrical service is available along most roads serving residences, but often is a significant distance from potential landfill locations, requiring costly service extensions or use of an on-site generator.

Water and sewer service is available in limited areas. Most of these areas are in incorporated municipalities. Service may not be available to transfer and landfill site locations with provisions for water supply and wastewater disposal generally needing to be provided.

### 2.2.3 Land Development

Existing land development patterns impact collection routing and facilities locations. The solid waste collection system must accommodate very extensive routing to distant and sparsely settled areas, the cost of which is incorporated into the rates (approved by the WUTC or cities) for collection services in the various service areas. Locations for needed transfer stations and recycling centers have been accommodated by utilizing the existing industrial zoned lands near population centers or at previous landfill sites. New transfer and disposal facilities would require a conditional use permit (CUP) in the Minimum Requirements zone which is currently in effect in most of the unincorporated areas of the County.

## 2.3 Population and Economics – Current and Projected

The Population and economic structure are the most significant influences on the quantity and character of the solid waste generated in Okanogan County. Projected changes in population and industry are important to the planning process in order to anticipate changes in the quantity and composition of the waste stream. Changes in total population of a county have significant impact on the amount of waste generated, recycled, and processed.

The 2009 total population of Okanogan County is 40,500. The annual population growth rate is approximately 1.0% based on State of Washington Office of Financial Management (OFM) data for 2009 through 2028.

Current population densities (based on 2009 data) for planning area are presented in Table 2-1.

Okanogan County population estimates for 2009 are from the publication *April 1, 2009 Population Estimates of Cities, Towns, and Counties used for Allocation of Selected Revenues*, State of Washington OFM, Forecasting Division, Olympia WA. September 29, 2009.

City and county collection needs covered by the Okanogan County Solid Waste Comprehensive Plan include the City of Brewster, Town of Conconully, City of Okanogan, and City of Omak City of Oroville City of Pateros, Town of Riverside, City of Tonasket, Town of Winthrop, and unincorporated communities (see listing in Table 2-1). Town of Nespelem is covered by the Tribal Solid Waste Management Plan. The Towns of Coulee Dam (part of which is located in Okanogan County) and Elmer City use the Delano Landfill located in Grant County. Coulee Dam and Elmer City have relatively low populations: 850 for Coulee Dam's portion that lies in Okanogan county and 240 for Elmer City in 2009.

Countywide population data has been used for waste generation forecast, even though Coulee Dam and Elmer City are not participating in the Plan. Both cities have relatively low populations likely compensated for by seasonal influxes of tourists and workers. Thus, the average County population for waste generation purposes probably parallels the Census population for the entire County fairly closely.

**Table 2-1 2009 Population Densities and Housing Units**

Jurisdiction	Population 2009	Area Square Miles	Density Pop/ Sq. Mile	Housing Units
Brewster	2,205	1.21	1,822.31	750
Conconully	210	0.22	954.55	148
Nespelem	205	0.19	1,078.95	83
Okanogan	2,495	2.28	1,094.30	1,022
Omak	4,780	3.79	1,261.21	2,082
Oroville	1,750	1.69	1,035.50	856
Pateros	630	0.43	1,465.12	277
Riverside	330	0.91	362.64	146
Tonasket	1,010	0.74	1,364.86	514
Twisp	985	0.71	1,387.32	546
Winthrop	425	1.23	345.53	309
Unincorporated	25,475	5,254.60	4.85	14,379
<b>Total</b>	<b>40,500</b>	<b>5,268</b>	<b>7.69</b>	<b>21,112</b>

(1) Housing units data includes single and multiple units, mobile homes, and trailers.

Note: The Town of Coulee Dam and the Town of Elmer City are included as part of Unincorporated totals; however, both utilize Grant County Landfill for solid waste disposal.

Source 2009 Population Trends, State of WA. Office of financial Management, Forecasting, Division, Olympia WA. Sept. 2009

### 2.3.1 Population Changes

Okanogan County's population increased approximately 21% since 1990 (an increase of 6,214 capita). This reflects an annual average increase of approximately 1%. Population projections by Washington State's Office of Financial Management (OFM) indicate the county population is expected to grow slowly through the year 2030 (the longest projection currently published) with a county total of 49,239 (OFM Intermediate Series Projections, 2007).

According to the Washington State's Office of Financial Management (OFM) data, there is a significant and continued demographic shift in the average age of the County population. The County's average age has been increasing, as the number of retirees continues to increase. This shift has implications for patterns of waste generation, although waste generation patterns often track more closely to household income than population age.

Washington's population age 65 and over is growing at an increasing rate. OFM's November 2008 state forecast indicates that this trend is expected to hold through 2028. Over 2008-2009 Okanogan County's elderly population increased by approximately 4% from 6,863 to 7,143. Persons age 65 years and over represent 16.9% of the 2009 county population. By comparison persons age 65 and over represent 11.7% of the state's population.

Recent and projected changes in the age composition and location of population indicate future changes that may result in slightly altered waste generation patterns. The trend of increasing population in unincorporated areas is likely to continue, while incorporated populations are expected to remain stable overall, with gains and losses in individual municipalities. For example, between 2001 and 2002, the County's incorporated area population decreased by 0.6%, while the unincorporated areas increased by 0.8% for example, between 2000 and 2009 the average annual percent

increase in unincorporated areas was approximately 0.34% while the average annual percent increase for incorporated areas was 0.13%.

### 2.3.2 Employment and Industry

Table 2-2 provides a summary of County employment in 2008, the most recent year for which data are available. The employment profile is based on employees covered by employment security, and excludes those who are self-employed or otherwise ineligible for jobless benefits. Thus, this employment profile likely underestimates agricultural and construction employment categories.

**Table 2-2. 2008 Employment Categories in Okanogan County**

Job Category	Employees	% of Empl.	% Wages
Agriculture, Forestry, Fishing, and Hunting	7,012	38.92%	44.25%
Mining	63	0.35%	4.36%
Utilities	407	2.26%	2.08%
Construction	807	4.48%	4.97%
Manufacturing	493	2.74%	3.29%
Wholesale Trade	219	1.22%	1.10%
Retail Trade	1,651	9.16%	7.21%
Transportation and Warehousing	125	0.69%	0.76%
Information	140	0.78%	0.59%
Finance and Insurance	156	0.87%	0.95%
Real Estate	116	0.64%	0.41%
Technical Services	197	1.09%	0.93%
Management of Companies	0	0.00%	0%
Waste Management	257	1.43%	1.08%
Educational Services	1,368	7.59%	6.56%
Health Care and Social Assistance	1,964	10.90%	8.42%
Arts, Entertainment, and Recreation	206	1.14%	0.62%
Accommodation and Food Service	1,142	6.34%	2.79%
Other Service	490	2.72%	1.38%
Public Administration	1,202	6.67%	8.24%
<b>Total</b>	<b>18,015</b>	<b>100%</b>	<b>100%</b>

In the recent past, employment growth has occurred primarily in services, including: hotel/motel, recreational, educational, and medical services, and hairdressers/cosmetologists. Transportation and utilities, financial services, and wholesale trade are each expected to grow to a smaller degree, with the smallest gains experienced in manufacturing.

The implications for waste management include: increased number of collection stops particularly in unincorporated areas due to growth occurring in those areas; less than average per capita growth in waste generation due to a slower rate of income growth; increased business and commercial collections related to the recreation industry; and few new sources of industrial wastes.

## 2.4 2009 and 20-year Projected Waste Generation

The term “waste generation” indicates the total amount of discards requiring management by the County’s solid waste system. The generated waste can be handled

either through recycling collection or garbage collection programs. Waste generation includes both recycling and disposal quantities but does not include those materials diverted through waste reduction activities such as backyard composting or other activities, since those materials do not require management through the County's formal recycling or disposal system.

### 2.4.1 2009 Waste Generation

Table 2-3 presents 2009 waste disposal At the Bridgeport Bar Transfer Station, Ellisforde Transfer Station and the Twisp Transfer Station. These data are based on County billing records with confirmation from haulers, as available.

**Table 2-3 2009 Waste Disposal by Source and Region**

Location	Tonnage
<b>Central Landfill</b>	
.Colville Solid Waste	1,779.0
Sunrise Disposal	3,133.0
Okanogan Valley Disposal	2,069.0
Roll-off Boxes Commercial	1,041.0
Other Commercial	2,075.0
Cash Self-haul	3,239.0
<b>Subtotal</b>	<b>13,336.0</b>
<b>Bridgeport</b>	
<b>Subtotal</b>	<b>4,704.0</b>
<b>Ellisforde</b>	
<b>Subtotal</b>	<b>5,495.0</b>
<b>Twisp</b>	
<b>Subtotal</b>	<b>4,063.0</b>
<b>GRAND TOTAL</b>	<b>28,608.0</b>

### 2.4.2 20-year Projections

The 20-year projections for waste covered by this plan was estimated by using 2009 as a baseline year, looking at population changes throughout the planning period, and then projecting forward. Projected waste generation is detailed in table 2-4 OFM population projections were reviewed to produce population projections and waste generation projections for this study. The following sections address Table2-4 assumptions.

**Table 2-4. 20 Year Population, Waste Generation and Disposal Projections**

Year	Base Pop.	Per-capita Generation (tons/year)	Total Generation (tons/year)	Recycling (tons/year)	Recycling Rate (%)	Disposal (tons/year)
2009	40,500	0.70	28,546	1,111	3.9	27,435
2010	42,739	0.70	30,124	1,231	4.09	28,893
2011	43,184	0.70	30,438	1,306	4.29	29,132
2012	43,650	0.70	30,766	1,386	4.50	29,380
2013	44,093	0.70	31,078	1,470	4.73	29,609
2014	44,520	0.70	31,379	1,558	4.97	29,821
2015	44,923	0.70	31,663	1,651	5.21	30,012
2016	45,232	0.70	31,881	1,745	5.47	30,136

2017	45,572	0.70	32,121	1,846	5.75	30,274
2018	45,900	0.70	32,352	1,953	6.04	30,399
2019	46,219	0.70	32,577	2,065	6.34	30,512
2020	46,526	0.70	32,793	2,182	6.65	30,611
2021	46,853	0.70	33,024	2,307	6.99	30,716
2022	47,158	0.70	33,239	2,439	7.34	30,800
2023	47,453	0.70	33,447	2,577	7.70	30,870
2024	47,739	0.70	33,648	2,722	8.09	30,926
2025	48,016	0.70	33,843	2,874	8.49	30,969
2026	48,285	0.70	34,033	3,035	8.92	30,998
2027	48,528	0.70	34,204	3,203	9.36	31,002
2028	48,775	0.70	34,378	3,380	9.83	30,998

The 2009 base population is referenced from State OFM projections. As discussed previously, some error is introduced by using countywide populations rather than excluding Coulee Dam and Elmer City populations, but this is offset by the seasonal influx of recreational visitors. The OFM population forecast is 48,775 in 2028. This is reflective of an average annual growth of about 1.0% over the 20-year planning period.

Per-capita waste generation has been calculated at 0.70 tons per capita per year in 2009, the last year for which full data is available. This figure is 51% of the 2008 state average of 1.37 tons per capita<sup>2</sup>. The difference is due to lower than average household incomes, lower commercial and industrial activity in the County, and the fact that waste streams such as yard and garden wastes, and land clearing and demolition debris are commonly disposed of in locations other than the established solid waste facilities.

**Table 2-5 Municipal Solid Waste Generated (pounds/person/day)**

MSW Only	2000	2001	2002	2003	2004	2005	2006	2007	2008
Waste Generated	6.58	6.71	6.55	7.01	7.51	7.86	7.97	7.86*	7.52

Solid Waste in Washington State 17th Annual Status Report, Solid Waste and Financial Assistance Program December 2008 Washington State Department of Ecology

\*This equates to the State average of 1.43 tons per year per capita.

In 2009, total generation was 28,608 tons. Of the total generation, approximately 1,110 tons were recycled (projecting from 2000 Department of Ecology data) and 27,498 tons were disposed into the Central Landfill. Table 2-4 holds the per-capita generation constant throughout the planning period, but increases recycling tonnage by 3% per year, roughly double the increase due to population. As a result, the recycling rate increases slightly over the planning period.



<sup>1</sup> The 2008 State averages were 1.37 tons per capita per year generated, with 0.76 tons disposed and 0.62 tons recycled.

### 2.4.3 Waste Composition

The Department of Ecology has performed three waste composition studies over the last fifteen years. The studies have typically surveyed the disposed waste stream from residential, commercial and industrial generators to determine which materials are currently disposed of as garbage. The results are used to assess the performance of recycling programs and to serve as background data for planning new programs and policies to minimize the quantity and toxicity of disposed waste.

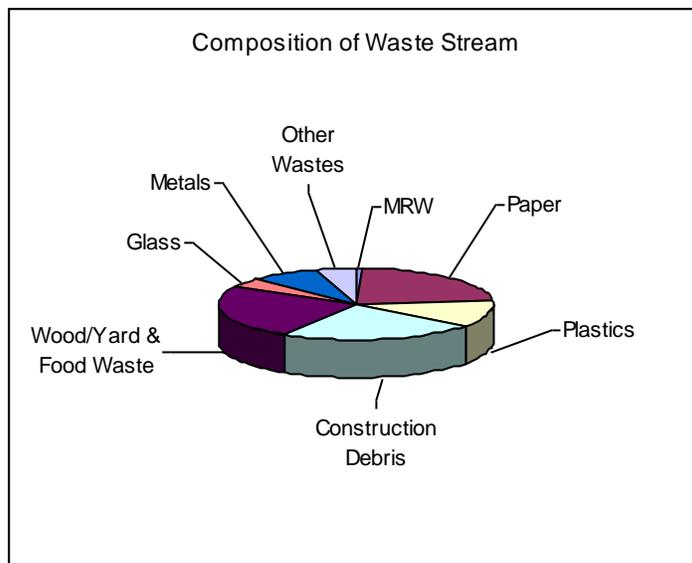
The latest Eastern Washington sampling was performed in 2002, and included data from self-haul and commercial haulers' loads delivered to the Okanogan County Central Landfill.

**Table 2-6 2002 Combined Residential and Commercial Waste Stream**

Waste Type	Percentage
All Paper and Cardboard	27.7
Plastics	12.0
Glass	6.1
Metals	9.8
Organics (food, yard waste, other)	23.5
Construction Debris	6.6
Other (diapers, textiles, etc.)	5.0
MRW (Hazardous and Special Wastes)	1.7

Waste composition in Okanogan County has probably not changed considerably since 2002, other than background changes due to changes in packaging technology. The percentage of plastic has likely increased, while glass and paper has likely decreased. Few major waste diversion programs have been introduced in that time that would significantly shift the composition of disposed waste.

**Figure 2-1 2002 Combined Residential and Commercial Waste Stream**



The Department of Ecology conducted a waste composition analysis at the county Transfer Stations and Central landfill during 2002. The observed waste composition correlated closely with the previous 1992 statewide composition. The 2002 analysis is provided as Appendix E



# Chapter 3

## Waste Prevention

The terms "waste reduction" and "recycling" are often confused. Waste reduction and waste prevention refer to not creating waste or minimizing waste at its point of generation. Recycling diverts materials from the waste stream for processing into new goods. Washington State's definition for waste reduction, as stated in RCW 70.95.030(23) is as follows: "Waste Reduction' means reducing the amount or toxicity of waste generated or reusing materials." In this Plan, the terms "waste reduction" and "waste prevention" are used interchangeably, with a preference for the less confusing term, waste prevention.

The Plan's broad waste prevention objective is to have the total waste stream (before recycling) grow at a markedly slower rate than population and economic growth. The 1993 Plan did not include a numerical waste prevention goal, although it was intended that waste prevention would contribute to that Plan's 30% goal.<sup>3</sup>

Waste prevention rates are commonly measured based on per capita waste generation rates (including both disposal and recycling). It is important to note that it is very difficult to accurately and cost-effectively measure waste prevention activities due to the nature of waste prevention—there is no production of waste in the first place.

### 3.1 Existing Conditions

A number of waste prevention programs operate in Okanogan County, by both local and state agencies. Local efforts to encourage waste prevention include:

- Annual County Fair booth display and information distribution, operated by the Public Works Department with support from the Department of Ecology (Ecology).
- Web access on Okanogan County site.
- Printed materials on local waste reduction, recycling, and reuse opportunities as well as alternatives to hazardous products.
- Printed materials promoting home composting.
- Purchasing bulk foods
- Services provided by charitable organizations, thrift stores, antique stores, rental agencies, etc.

<sup>3</sup> Set by Okanogan County Solid Waste Advisory Committee 1984

During the early 1990s, the County had a part-time waste reduction/recycling coordinator funded, in part, by an Ecology grant. This position has since been terminated, with those responsibilities transferred to the County's solid waste manager.

State waste reduction programs having local impact include the following:

- Grant funding assistance for local waste reduction programs.
- Library of films and videos on waste reduction topics.
- Waste reduction programs implemented in state offices and institutions.
- Award programs for school and institutional waste prevention.
- Operation of Ecology's "Recycling Hotline," that provides waste prevention information to callers, as well as recycling assistance (Ecology also operates a parallel website, Access Washington, Information Clearing House, with county's general information on recycle opportunities, reuse programs and household hazardous waste drop off sites).
- Legislative provisions for including costs of information distribution by local solid waste haulers and operating expenses for rate setting purposes.
- Technical assistance for local governments interested in establishing waste prevention programs.
- Continued planning and legislative support for waste prevention activities (including toxicity reduction) throughout the state.

Existing State programs have a limited ability to raise consumer awareness and are mainly intended to assist local jurisdictions in implementing their own waste reduction program. Well focused local programs, developed with the support and assistance of the public within each jurisdiction, are the key to shifting individual habits toward reduced waste generation.

The County has had limited funds to maintain existing programs or launch new waste prevention initiatives. Thus, backyard composter distribution programs, and other similar waste prevention programs have not been implemented. Reuse and/or exchange materials for non-hazardous materials such as latex paint have proven to be unworkable in Okanogan County due to local temperature extremes which render almost all discarded paint unusable.

The apparently low waste generation rate (compared to State wide averages) is most likely due to lower household income, low waste generation lifestyles<sup>3</sup> and/or inappropriate disposal, such as backyard burning and burying, rather than a high level of conscientious waste prevention. However, some activities such as extending the life of durable goods through reuse and repair are often a more established ethic in rural areas and contribute to a reduction in waste generation rates. The extent to which this may be the case in Okanogan County is unknown.

Garbage collection rate incentives have been used in many jurisdictions to encourage waste prevention and recycling. Residential rate incentives are developed by cross-subsidizing lower services levels from higher service levels. For example, a single 20-gallon mini-can or 32-gallon garbage can would be proportionately lower priced, and

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<sup>3</sup> e.g., buying fewer disposal goods, hunting, canning, etc.

the two- or three-can rate would be proportionately higher. This approach is very common in Western Washington and less so in Eastern Washington. Mini-cans are offered in some areas of Okanogan County. Rate incentives are further discussed in Chapter 7 – Collection.

## **3.2 Needs and Opportunities**

Funding constraints and the elimination of formal staffing for waste prevention education in Okanogan County have severely restricted progress in waste prevention education and material reuse programs. The financial constraints inherent in the County's solid waste system will continue to make the implementation of an expanded waste prevention program very difficult.

The following sections address needs and opportunities for waste prevention related to funding, promotion, financial incentives, and reuse.

### **Baseline Monitoring**

There is relatively little data on shifts in waste generation patterns, other than dividing observed annual landfill disposal quantities by total population to obtain a rough per-capita measurement. Additional effort should be considered to document the sources and quantities of solid wastes by geographic and generator (e.g. residential, commercial, construction, demolition) sectors to allow more accurate analysis of waste generation patterns. This, in turn, will allow programs and policies to be better targeted and more cost-effective.

### **Funding**

In most Washington State jurisdictions, waste reduction and recycling programs are considered an integral part of the overall solid waste system, and are budgeted accordingly as a component of disposal fees or disposal/collection district revenues. This relatively stable funding base can provide for the implementation of various educational or facility improvements over the life of the Plan, even if the funding base is small relative to the overall solid waste fund.

This has not been the case in Okanogan County. Although the County has been able to take advantage of Ecology grant funds in the past, those grants are not a stable source of revenue for staff positions, and do not necessarily provide long-term funding.

The County will need to determine what level of funding can be absorbed within existing disposal fees, additional fees, other funding sources and how to continue current programs with the unstable or total loss of grant funds.

### **Education and Promotion Programs**

The County will need to develop a formal waste prevention component to their overall solid waste program, in order to meet Plan goals and to contribute to State solid waste reduction goals. This component could include any number of promotional and educational elements, but should be based on specific objectives and annual work plans.

### Financial Incentives

Waste prevention offers inherent financial incentives. However, the County and participating cities may have the opportunity to expand financial incentives for waste prevention. Incentives could include differential tipping fees for varying types of wastes or reduced permit fees for construction projects that include a reuse component.

### Reuse

The County does not currently provide a waste exchange area at the Central Landfill. There is an opportunity to increase material reuse and reduce the disposal of usable items through the development of an exchange area.

## 3.3 Alternatives

Some waste prevention alternatives are somewhat constrained by the limited waste diversion infrastructure available in Okanogan County. For example, disposal bans on yard debris are common throughout North America to encourage waste prevention and centralized composting. However, since there are no publicly-accessible composting operations in Okanogan County, there is no practical alternative for managing yard debris other than backyard composting, which cannot be practiced by all households. Thus, disposal bans cannot be implemented as a waste prevention alternative in Okanogan County.

### Funding

Few alternatives are available for funding waste prevention programs. In Okanogan County, only disposal tipping fees and grants are available for funding waste prevention.

### Education and Promotion Programs

There are several alternatives for education and promotion programs:

- The County could support “Master Recycler” and “Master Composter” training programs. Under this model, the County sponsors a training course and resource notebook for interested individuals; those individuals then agree to provide at least 40 hours of public contact time teaching others about recycling or composting techniques. These programs are often a cost-effective way to provide volunteers at public events, fairs, and other promotional opportunities. These volunteers can also serve as a grassroots resource to help increase waste prevention and recycling awareness within their neighborhoods and peer groups.
- The County could develop and produce a range of brochures about waste prevention topics. Brochures could then be distributed at key locations throughout the County. Potential topics could include toxic reduction, backyard burning, material reuse, backyard composting, and selective purchasing.
- Information about waste prevention and recycling could also be provided at the point of disposal on garbage collection containers. A “door hanger” tag

or sticker could be attached to waste containers, providing either specific or general waste prevention and recycling information.

- The County could develop and implement a non-residential technical assistance program to help area businesses and institutions review operations, evaluate waste prevention and recycling alternatives, and plan implementation activities. This program could work in conjunction with existing Ecology programs or provide extended outreach beyond the ability of Ecology's existing program.

#### Financial Incentives

Some possible financial incentives could include the following:

- Incentive garbage collection rates could be implemented in city contract areas. Specific alternatives and recommendations for solid waste collection incentives are discussed further in Chapter 6 – Collection.
- Differential disposal fees could be developed for selected waste streams. For example, a lower disposal fee could be charged for construction/demolition loads free of reusable and/or recyclable materials.
- Reduced construction or demolition permit fees could be charged for projects demonstrating waste reduction or recycling activities.

#### Reuse

- The County could consider promoting and supporting a community swap event one or more times each year to promote the exchange, rather than disposal of reusable materials, also educating the community of reuse and recycling at said events.

### 3.4 Recommendations

Waste prevention recommendations were developed by the County SWAC during a meeting in August 2010.

Recommendations, including implementation responsibilities and procedures, are discussed below. Implementation and operation timeline schedules are provided in Table 3-1. County staffing requirements are expressed in “Full Time Equivalents” (FTEs), where 0.1 FTE is equal to 180 hours of staff time per year.

**Recommendation 3-1: Annual Workplan.** The SWAC and the County administration will annually review progress toward waste prevention and recycling goals and based on progress and grant funding availability, will develop an annual workplan to implement waste prevention programs. The workplan will review options for working with various community partners to further waste prevention and recycling within Okanogan County.

**Recommendation 3-2: Waste Monitoring.** The County will develop a tracking system to annually monitor and evaluate waste generation throughout the planning area. The tracking system will be used to determine progress toward waste prevention

and recycling goals, as well as identify potential areas of concern with illegal disposal or export.

**Recommendation 3-3: Master Composter/Recycler Programs.** The County will work with local agencies, such as cooperative extensions or other partners to design and implement Master Composter and Master Recycler programs in order to train volunteers as community resources.

**Recommendation 3-4: Financial Incentives.** The County SWAC will periodically review the potential for additional financial incentives for waste prevention and recycling. The SWAC will provide recommendations to the County and cities for potential programs and policies.

**Table 3-1. Implementation and Operation Timeline**

Recommendation	2011	2012	2013	2014	2015
R3-1 Annual Workplan					
R3-2 Waste Monitoring					
R3-3 Master Composter/Recycler					
R3-4 Financial Incentives					

**Cost (Staff Hours/Cost in Dollars)**

Recommendation	2011		2012		2013		2014		2015	
	Staff	Cost								
R3-1	30	630	30	630	30	630	30	630	30	630
R3-2	24	450	16	300	16	300	16	300	16	300
R3-3	100	7200	50	3600	50	3600	50	3600	50	3600
R3-4	0		0		0		0		0	



## Chapter

**4****Recycling**

This chapter describes the recycling and source-separated components of Okanogan County's solid waste management system. State law defines recycling as:

Transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill disposal or incineration. (RCW 70.95.030(15))

The term “recycling” applies both to the recycling of paper, metals, plastics, and other traditionally recycled materials, and to source-separated organics composting. Municipal Solid Waste Composting is discussed separately, in Chapter 5 Organic Wastes & Composting and Chapter 6 – Waste Processing Technologies.

#### **4.1 Existing Conditions**

##### **Current Recycling Rate**

Ecology performs an annual survey of all recycling centers, collection companies, brokers, end-users and selected large generators. Survey volumes from operations within each county are combined to provide an estimate of “in-county recycling.” Since reporting is voluntary, and not all recyclers or generators report their volumes, estimated County recycling rates are inherently underestimated.

Survey volumes from brokers and end-users that are unable to specify the origin of their materials are tallied and in the past, have been allocated to counties on the basis of each county's proportion of reported recycling. This methodology has shifted over time so that now scrap metal is no longer apportioned across all counties and instead is applied to the State's overall recycling rate. While Ecology's method of determining county recycling rates may include some error, it provides a basis for estimating current levels of recycling.

For 2009, the last year for which Ecology survey data is available, Ecology estimated that a total of 13,710 tons were recycled in Okanogan County, including some moderate risk wastes, such as antifreeze and florescent tubes. This represents a recycling rate of 10.6%, excluding unreported materials recycled by wrecking/scrap yards. Thus, the total recycling rate is between 10–15 %, if unreported scrap metals and cross-county border recycling such as materials recycled through Chelan haulers are included.

Methow Recycles a non-profit 501c3 organization recycled 435 tons in 2009. Okanogan County Recycle Facility recycled 1,110 tons for 2009.

Table 4-1 provides a breakdown, by commodity of collected recycling quantities, as reported by Ecology for 2009 for all of Okanogan County. Moderate risk wastes such as antifreeze and fluorescent tubes have been included in the table.

<b>Table 4-1. 2009 Okanogan County Recycling Tonnage</b>	<b>Tons</b>
Newspaper	138.98
Corrugated Paper (cardboard)	879.24
High Grade	28.83
Mixed Waste Paper	190.42
Aluminum Cans	71.19
Tin Cans	18.51
Ferrous Metals	659.46
Nonferrous Metals	55.74
Container Glass	154.50
Plastics	54.93
E-Waste	42.18
Vehicle Batteries	77.84
Other Batteries	4.40
Used Oil	209.82
Tires	168.22
Rendering	374.20
Wood Waste	10,566.66 <sup>4</sup>
Other	15.15 <sup>5</sup>
<b>Total Recycled</b>	<b>13,710.00</b>

In Okanogan County, recyclable materials are collected through a variety of programs, both private and publicly sponsored. The following sections of this chapter review current recycling efforts for a variety of sectors, including residential recycling collection programs, commercial/non-residential collection, drop off/buy-back sites, and recycling of special materials.

### **4.1.1 Residential Collection Programs**

#### **Regulatory Framework**

State law currently allows cities and counties to control both single family and multifamily residential recycling, although to differing degrees. Cities have the most authority and may directly provide or contract for, franchise with, or direct Washington Utilities and Transportation Commission (WUTC)-certificated collection companies to collect recyclables within their jurisdictions. Counties have less authority and may only contract or direct WUTC-certificated collection companies (via Service Level Ordinance) to collect residential recyclables and/or organics in unincorporated areas.

#### **Services**

In practice, cities typically determine whether to include recycling services in municipal collection contracts or through the provision of municipal collection services. No cities within Okanogan County have chosen to offer source separated recycling collection or

<sup>4</sup> Burned for energy

<sup>5</sup> Includes antifreeze fluorescent tubes, compact fluorescent bulbs, and ink cartridges

drop-off recycling services and have instead relied on the County rural drop-off recycling system. Currently The Solid Waste Advisory Committee is actively studying a co-mingled recycling service. Okanogan County does not have a Service Level Ordinance directing any recycling collection activities.

Although some areas within the County may meet the definition of urban-type densities appropriate for source separated recycling collection (e.g. Omak/Okanogan), those cities have elected to instead rely on the County drop-off recycling system and the recycle center located at the Central Landfill due to cost considerations and a desire to minimize collection rates within those cities.

### 4.1.2 Non-Residential Collection Programs

The non-residential sector includes industrial, commercial, and institutional generators of recyclable materials. Collection services for the non-residential sector are typically less uniform or tailored to the varied needs of generators.

#### Regulatory Framework

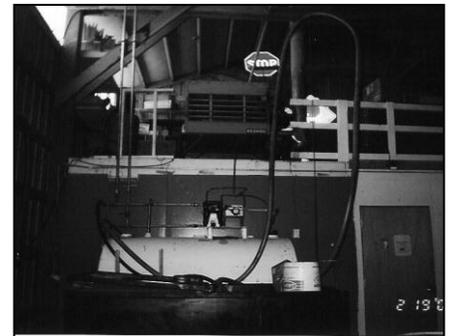
Commercial recycling collection was deregulated in 1994 at the Federal level. Local, state, and federal governments cannot regulate rates, routes or services for hauling commercial property, including recyclables. Prior to 1994, the WUTC regulated property carriers through common carrier permits (separate and distinct from garbage collection certificates). Many garbage collection companies in Washington State had obtained common carrier permits to mirror their garbage collection activities, even if they did not actively offer commercial recycling services. The WUTC's role is now limited to confirming insurance and similar activities for firms holding common carrier permits.

#### Services

Service providers in urban areas typically include “informal collectors” that use pick-up trucks to collect cardboard or scrap metal for resale to recycling centers, private recyclers that collect and process specific materials, and garbage collection companies (operating under common carrier permits) that collect a wide range of materials that are then delivered to local recyclers.

Much of this infrastructure is unavailable in Okanogan County. The County recycling site at the Central Landfill, Okanogan Sales and Recycling at Ellisforde and the Methow Recycles Facility are the only multi-material recycling processing sites. Neither directly offers commercial recycling collection, although all accept self-hauled commercial materials.

Okanogan County certificated haulers all have common carrier permits, which allow them to offer commercial recycling collection services. However, these businesses have not typically solicited small customers due to the lack of processing sites. Sunrise Disposal, Okanogan Valley/Upper Valley Disposal, and Methow Valley Sanitation haul



drop boxes of cardboard to either the Central Landfill Recycling Center or the Methow Recycles facility.

### 4.1.3 Drop-off and Buy-Back/Processing Sites



Okanogan County is served by three multi-material recycling processing sites as well as several recycling collection and/or buy-back sites. Materials are processed at either the County's Central Landfill recycling site, the Okanogan sales and recycling site at Ellisforde or the Methow Recycles Facility at the Twisp site. Some non-ferrous metals are also recycled at wrecking yards and other private sites and metal drives.

The County's Central Landfill recycling operation consists of a 2,412 square foot enclosed processing building where materials are sorted and baled. The facility was developed in 1993 and currently processes about 1000 tons per year. The current facility was developed by the County with State Department of Ecology grant support and is supported through disposal tipping fees. The site accepts newspaper, cardboard, white ledger paper, mixed waste paper, magazines, plastic jugs, motor oil, and lead-acid batteries. Aluminum and selected non-ferrous metals are also purchased from the public.

The Methow Recycles in Twisp was developed by the Methow Conservancy in conjunction with the Department of Ecology, the Okanogan County Electric Cooperative, Okanogan County, and numerous sponsors. Planning work and obtaining grant support started in 1999, with the construction of the 4500 square foot building completed in early 2002. The center is located at the County's Twisp transfer station, and it is operated by a non-profit organization. The County supports the facility by providing a land lease at \$1 per year and providing power to the site. During 2009, the center recycled 435 tons of materials. The site accepts aluminum cans, newsprint, cardboard, white ledger paper, HDPE and PET plastic containers, glass, tin cans, magazines and E-Waste. No materials are purchased from the public. In mid-2002, the organization purchased a glass crusher which process's glass to produce a glass-course sand product. In 2009 155 tons of glass was processed.

Okanogan Sales and Recycling located 1 mile north of Ellisforde, WA. and Riverside Recycling at 100 Main Street in Riverside, WA. are buy back sites for nonferrous metals and some ferrous metals.

II Sister Video Store at 415 S. Whitcom Ave. Tonasket accepts toner and ink cartridges, cell phones, iPods and Laptops for Green Okanogan/GO Recycle.

Havillah Road Printing & Graphics at 23 E. Apple Ave. Omak, WA. accepts clean Styrofoam peanuts, toner, ink cartridges and cell phones.

Home Depot at 920 Engh Road Omak, WA. Accepts used tool batteries and CFL's (compact florescent light) bulbs.

There are also a number of drop-off recycling sites in the Okanogan County some of which are listed at Ecology's hotline database. Recycling sites are shown on Figure 4-1. Each location is described below.

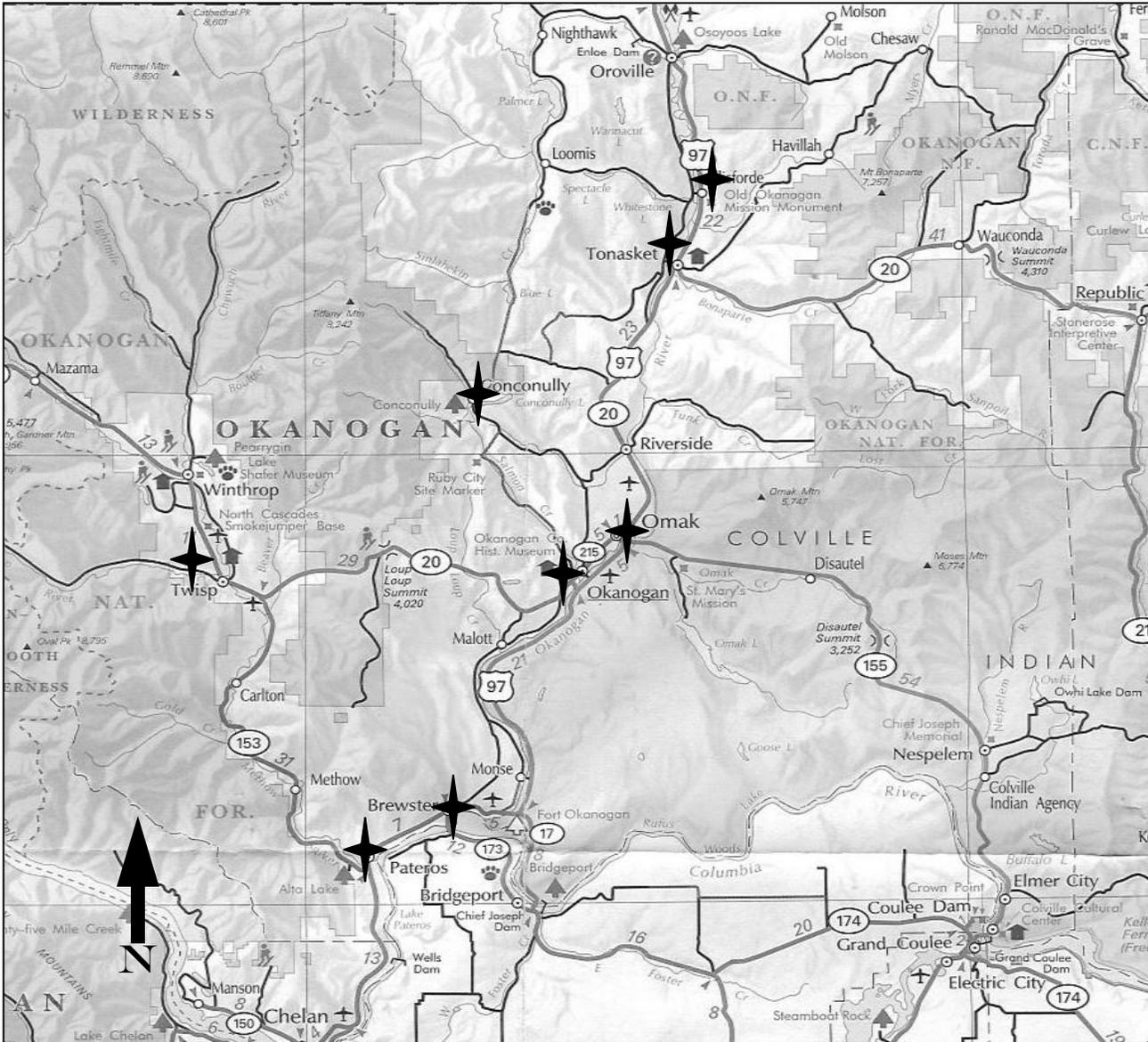
**Table 4-2. Recycling Drop-off Sites**

<b>Brewster:</b>	Moomaw Parking Lot. The 24-hour site accepts aluminum cans, cardboard, and newspaper.
<b>Ellisforde:</b>	Okanogan Sales and Recycling, Highway 97 1 mile north of Ellisforde. A private operator operates a scrap metal buy-back site.
<b>Ellisforde Transfer station:</b>	Open during Transfer station hours 65 Swanson Mill road Oroville, this site accepts aluminum cans, newsprint and cardboard.
<b>Conconully:</b>	Recycling drop-box on the 200 block of Main Street. The 24-hour site accepts aluminum cans, newsprint, and cardboard.
<b>Okanogan:</b>	1st and Spruce Streets. The 24-hour site accepts aluminum cans, cardboard, and newspaper.
<b>Okanogan:</b>	Drop Box located at Okanogan Public Works, 1234-A 2nd Avenue with 24-hour access the site accepts aluminum cans, cardboard and newspaper.
<b>Okanogan:</b>	Okanogan Bingo Casino. The 24-hour site accepts cardboard from area businesses.
<b>Omak:</b>	Pardner's Mini Mart, 111 Riverside Drive. The 24-hour site accepts aluminum cans, newsprint, and cardboard.
<b>Pateros:</b>	Commercial Avenue. The 24-hour site accepts aluminum cans, cardboard, and newsprint.
<b>Tonasket:</b>	Railroad Avenue. The 24-hour site accepts aluminum cans, cardboard, and newsprint.
<b>Twisp:</b>	Methow Recycles 12 Airport Road accepts aluminum, newsprint, magazine, corrugated cardboard, office paper mixed paper, non-ferrous metals, glass, tin E-Waste complete listing at <a href="http://www.methowrecycles.org/whatwerecycle.html">www.methowrecycles.org/whatwerecycle.html</a>
<b>Winthrop</b>	Methow recycles Horizon Flats depot is open during snow-free months, accepting cardboard, aluminum, newspaper, office paper and magazines. Complete listing at <a href="http://www.methowrecycles.org/location_hours.html">www.methowrecycles.org/location_hours.html</a> .

# Recycling Drop-Off Locations

FIGURE 4.1

## OKANOGAN COUNTY



#### **4.1.4 Special Materials**

A number of recycling opportunities exist for a wide range of materials that are not traditionally considered recyclable commodities or that are considered problem materials. This section reviews current recycling efforts for these materials.

##### **Lead Acid and Household Batteries**

Lead acid batteries are accepted for recycling by the County at the Central Landfill. Batteries are not currently collected at transfer sites due to permit conditions. Collected batteries are consolidated and properly disposed of thru a local dealer.

Household batteries (dry cell batteries such as mercuric-oxide, silver-oxide, alkaline, zinc-cased, lithium, and nickel-cadmium) are being collected at participating retailers, the transfer stations and at the landfill. The batteries are then bagged and shipped to a specialized metal/battery recycler.

##### **Tires**

Most tires generated in Okanogan County are managed by individual tire stores. A licensed tire hauler is typically paid to ship the collected tires to fuel processors, recycling facilities, or other storage or disposal facilities. Relatively few tires are brought to the County's Landfill. The County charges a per-tire fee at the Central Landfill and then ships accumulated tires through a Spokane-based licensed tire hauler to fuel processors or to out-of-state recyclers or stockpiles. The County shipped 73 tons of collected tires in 2010.

##### **Industrial Wood Waste and Land Clearing Debris**

Industrial wood waste consists of pallets, crates, manufacturing residuals, or old construction forms. These materials can be ground and used as hog fuel, bedding, chip board, or compost bulking agents. Most wood wastes are either landfilled with solid waste at the Central Landfill or buried or burned on-site at the point of generation. Wood waste is discussed further in Chapter 5 Organic Waste and Composting.

##### **Construction/Demolition Materials**

There are currently no formal recycling programs for construction/demolition materials in Okanogan County. Mixed construction/demolition wastes from construction, remodeling, and building demolition are currently landfilled as mixed waste, burned, or possibly shipped out-of-county to less expensive demolition landfills. Materials from buildings that are machine demolished are often crushed to a degree that limits reuse and recycling. These materials are usually disposed at landfills.

Some asphalt and concrete is probably recycled by aggregate firms, but no estimates are available about the extent of this practice or the quantities involved. It is much more likely that most asphalt and concrete is used as fill at permitted and unpermitted sites.

There is no known gypsum, wallboard recycling operations in Okanogan County.

### White Goods

White goods include household appliances such as clothes washers and dryers, dishwashers, ranges, refrigerators, freezers, and other large household appliances. White goods have long been recycled as light ferrous scrap. Regulations for the handling of Freon and chlorinated compressor oil have resulted in the segregation of compressor-equipped appliances at County transfer stations and the Central Landfill.

Collected appliances are drained, with Freon and compressor oils recovered, and the hulks are shipped to scrap metal processors.

### E-Waste

E-Waste for recycle usually consists of TV's, computer monitors and computer towers. Printers, keyboards, mice are specialty recycle items and currently not recycled in Okanogan County. Two organizations Green Okanogan in Tonasket and Methow Recycles in Twisp recycle e-waste consisting of TV's, computer monitors and computer towers.

## **4.1.5 Organic Materials**

Recyclable organic materials include all source-separated materials that can be composted without the introduction of unwanted pollutants in the finished compost. Potentially compostable organic materials include yard debris, food waste, soiled papers (e.g. coffee filters, tissue), and other similar materials.

The grass and leaf component of yard debris is typically composted on-site, disposed on vacant lots, or included in municipal solid waste. The brush component of yard debris is typically burned or disposed at the Central Landfill.

The Ecology organic material composted, recycled/diverted report indicates 124,289 tons of food waste was recycled in 2008. Food waste materials are discussed further in Chapter 5 Organic Waste and Composting.

## **4.1.6 Non Source-Separated & Co-mingled Recycling**

Non source-separated recycling refers to materials that are separated from municipal solid waste (MSW) at centralized facilities rather than at the point of generation. Co-Mingled refers to recycle materials mixed together often collected from residence's or at a central drop off location.

Centralized processing facilities that separate recyclables from mixed waste are sometimes called dirty material recovery facilities (dirty-MRFs) or material recovery facilities. These facilities usually consist of a series of conveyors; trammel screens, magnetic separators, air classifiers, and picking lines. Currently there are no Material Recovery Facilities in Eastern Washington State although there are some in the basic planning stages for the Spokane area.

A very close look/in depth study needs to be made for co-mingled recycling in Okanogan County. The logistics and impact on Solid Waste and recycle programs may cause a

negative or a positive outcome. At the current time there are no MRF's located within the market area to make co-mingled a viable option.

#### **4.1.7 Promotion and Education**

Okanogan County provides combined waste reduction and recycling promotion as described in Chapter 3 – Waste Prevention. These promotion and education programs (including State programs such as the 1-800-RECYCLE hotline) are described in detail in that chapter. The hotline may disappear if not state funded.

### **4.2 Urban/Rural Service Areas**

One of the requirements of the 1989 Waste Not Washington Act was that Comprehensive Solid Waste Management Plans include an urban/rural designation to specify recycling collection service areas (codified as RCW 70.95.092). Minimum performance requirements are specified for each area, including the establishment of source separated recycling services (or programs yielding greater diversion in urban areas) and drop-off recycling opportunities in rural areas. Minimum requirements are also specified for yard debris collection in both urban and rural areas.

Although Okanogan County includes several cities, all are relatively small. A benchmark figure for evaluating the feasibility of urban-type source separated recycling programs is a minimum city population of 4,000–5,000. In Okanogan County, only the City of Omak falls within this range (with a 2009 population of 4,780). No other city exceeds 2,500 population and most are much smaller.

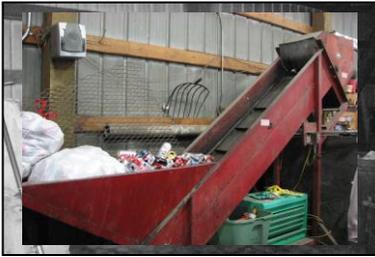
Only the combined Cities of Omak and Okanogan could be considered to have the population approaching the minimum necessary for viable urban source separated collection programs. However, the limited recycling processing infrastructure, the high unit costs of processing recyclables, and distance from markets combine to make source separated recycling relatively expensive. In addition, the relatively low level of household income and high proportion of retirees on fixed incomes makes the addition of new programs with increased rates very unpopular. Thus, source separated recycling is not considered economically feasible at this time. The low to negative rate of population growth within these cities indicates that these factors will not likely change during the planning period. Therefore, for the purposes of this Plan, the entire planning area is designated “rural” for the purposes of meeting RCW 70.95 recycling requirements.

The previous Ecology guidelines for the development of Comprehensive Solid Waste Management Plans included criteria for rural recycling based on the provision of a fixed multi-material recycling center for every 5,000–10,000 population and recycling opportunities at or near each disposal facility open to the public. The most recent guidelines are less prescriptive, but still clearly expect both urban and rural counties to plan to meet the intent of State law and contribute toward the 50% diversion goal.

### **4.3 Recyclable Material Designation**

Department of Ecology Guidelines requires that comprehensive solid waste management plans include a list of designated recyclables. This list is used to determine which materials will be targeted by local recycling efforts and specifically, which

materials should be included in government-sponsored collection programs such as drop-off or source separated recycling programs.



The list of designated recyclables is intended to be developed through a review of each potential material's market value, market stability, transportation costs, and other factors. This analysis is intended to ensure that all recyclables that can be feasibly recycled are included in curbside/source separated or drop-off collection programs.

The actual market value of residential recyclables has remained somewhat stable over the past decade, until a significant price drop in 2008/2009. A review of historical market prices for newspaper, mixed paper, cardboard, aluminum cans, tin cans, and plastic bottles indicates that the weighted value (i.e. the average value of a ton of residential recyclables, weighted to reflect their composition in curbside/source separated collection programs) in several Washington Cities has averaged around \$35–60 per ton over the past few years. Processing costs have remained fairly stable at about \$25-45 per ton, depending on the degree of commingling, and have yielded a net material value of \$15–40 per ton in Seattle.

Transportation costs are the most significant barrier to recycling in Okanogan County. While trucking deregulation and backhauls can provide some relief, transportation costs remain high, ranging from \$20 to \$65 per ton, with the higher figure reflecting the cost of shipping materials to Seattle or Spokane.

If the decision on designating recyclable materials were based solely on markets and transportation costs, it is likely that only aluminum cans, newspaper, cardboard, and white ledger would be designated as recyclable materials. However, both the County and the Methow Recycles Project attempt to recycle additional materials (such as tin cans and plastics) to the degree possible. Designating a narrow range of recyclables for the purposes of meeting planning requirements can be counterproductive, since it may lead many to assume that collecting only the minimum with no changes during the planning period will meet statutory requirements for contributing to State goals.

Some jurisdictions have used a process known as a “recycling potential assessment” (RPA) to provide a mechanism for periodically reviewing and evaluating the progress of collection programs meeting recycling goals. This process is used to analyze current waste stream, existing and potential commodity recycling rates, and collection and processing costs to determine whether collection programs should be expanded to include other sectors or whether existing programs should be modified to target additional or different commodities. This process acknowledges that market conditions and collection technologies change over time and that periodic re-evaluation is necessary to obtain maximum cost-effective waste diversion levels.

An RPA process could be used, if appropriate, by Okanogan County to adjust the range of materials collected by drop-off collection programs within the county. Based on a review of current programs, the County would develop specific recovery goals for each recyclable material and use those goals to evaluate the performance of current collection systems. The list of designated recyclables would be reviewed at least every two years through the RPA to determine which materials should be added or removed from household collection programs. Criteria used in the RPA could include waste stream

composition, availability of markets or beneficial uses, processing capability or feasibility, capability of existing or new collection equipment, incremental and overall system cost impacts, public acceptance, and other factors.

Modifications to the range of materials handled by household collection programs will not require a Plan amendment. The RPA process is further described as Recommendation 4-1 in the recommendation section.

## 4.4 Needs and Opportunities

### 4.4.1 Residential Recycling

Additional multi-material drop-off sites should be made available, particularly in the northern and southern areas of the County. The Oroville and Pateros areas currently have very limited recycling opportunities.

The Colville Tribes are developing recycling within the tribal jurisdiction and have a drop off center in Nespelem.

The range of recyclable materials accepted is currently very limited. Since both the County's Central Landfill and the Methow Recycles have equipment and baler capacity, the feasibility of accepting additional materials should be considered.

An equitable funding mechanism needs to be developed for recycling activities. Existing funding levels for recycling are very low. The allocation of disposal tipping fees to various cost centers (including recycling) should be reviewed to balance diversion and disposal needs and objectives.

Other than large generators, relatively few institutions and commercial businesses have access to cost effective recycling services. Although subject to capacity constraints at the two recycling processing sites, the feasibility of regular cardboard collection services for non-residential customers should be evaluated. A collection service may be feasible and cost-effective for businesses if sufficient route density is obtained.

Similarly, office pack collection or drop-off may be feasible, if the County has sufficient processing capacity.

### 4.4.2 Drop-off and Buy-Back/Processing Sites

The range of recyclable materials accepted is currently very limited. Since both the County's Central Landfill and Methow Recycles have equipment and baler capacity, the marginal costs of adding additional materials should be continually evaluated.



### 4.4.3 Special Materials

#### Lead Acid and Household Batteries

The quantity of lead acid batteries recovered in Okanogan County could possibly be increased with additional promotion and recycling opportunities at the transfer stations.

The results of the household battery program are encouraging, and the program should be expanded to additional retailers.

#### Tires

No needs or opportunities were identified for tires, other than support for continued State and regional efforts for researching alternative diversion methods.

#### Industrial Wood Waste/Land Clearing Debris

Additional private recycling could be encouraged, although the existing practices of burning and burying will be difficult to counter.

#### Construction/Demolition

The County needs to ensure that construction/demolition wastes are properly handled through either disposal or recycling. If larger quantities of these segregated materials were received at the Central Landfill, the County could potentially provide some recycling services (e.g. grinding clean woodwaste).

### **4.4.4 Organic Materials**

Further investigation is needed to determine whether a centralized composting facility is desirable or feasible.

Wastewater utilities should be encouraged to consider composting as a management alternative for sewage sludge. Biosolids composting can provide a beneficial use for both the biosolids and yard debris. Composting materials are discussed further in Chapter 5 - Organic Waste and Composting.

## **4.5 Alternatives**

### **4.5.1 Single and Multifamily Residential Recycling**

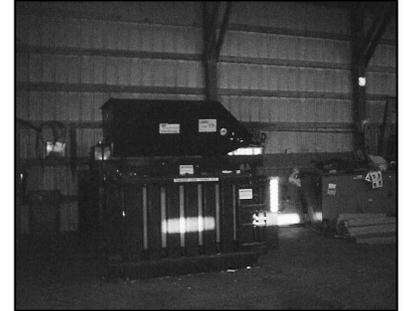
Alternatives for expanded residential recycling include:

- Considering an optional rural co-mingled collection program in the Omak/Okanogan core. The costs of an every-other-week program would probably be about of \$5-7 per month per household. This could be done with existing contracts at any time during the planning period.
- Expanding the current number of drop-boxes to include more locations in the north, south, and east portions of the County. Seek additional partners to monitor drop-box locations.
- The County could work with the Colville Tribes to provide a multi-material recycling location serving the eastern portion of the county within the Tribal boundaries.

### 4.5.2 Non-Residential Collection Programs

Alternatives for expanded non-residential recycling include:

- Working with contracted and certificated haulers to determine whether an office pack and/or detachable container cardboard collection route would be feasible in their respective areas. Feasibility is expected to be highest in the Omak/Okanogan and Winthrop/Twisp areas due to reduced transportation costs to processing sites.
- Developing a non-residential technical assistance program to help businesses identify waste diversion options, including recycling. This option would depend on the simultaneous expansion of actual recycling opportunities.



### 4.5.3 Drop-off and Buy-Back Processing Sites

Alternatives for drop-off and buy-back processing site recycling include:

- Determining a stable funding source or mechanism for covering recycling processing costs. The level of funding will need to be sufficient to cover the costs of an expanded recycling collection program. Two funding mechanisms are commonly used to fund recycling programs:
  - a. Incorporating a disposal tipping fee component to fund recycling programs. This mechanism can provide stable funding if the component is small relative to the overall disposal cost. If the component is large (e.g. 10–25%) and the diversion program is successful, there would be significantly reduced tipping fee revenues to cover recycling costs. Since the potential level of funding in Okanogan County would be relatively low, this is not expected to be a problem.
- Incorporating recycling costs into City collection contracts. This mechanism is typically used to fund source separated recycling, both in City contract areas and WUTC-certificated areas. Thus, the costs of residential recycling collection are embedded in collection fees paid by garbage collection customers. This is less appropriate for a drop-off based program, since both residential and non-residential customers use drop-off sites, and also both garbage collection subscribers and non-subscribers have access to drop-off recycling sites.
- Periodically evaluating the feasibility of adding materials to make full use of existing processing capacity. This could be performed through a Recycling Potential Assessment processor or done on a more informal basis, such as the glass recycling project being undertaken by the Methow Recycles Project.

#### 4.5.4 Special Materials

Alternatives for special materials include:

- The County could expand its promotion efforts to more specifically target lead acid and household batteries, and to further educate residents on the importance of recycling to achieve toxics reduction in landfilled solid waste.
- The County could investigate additional recycling opportunities for tires and set a preference for shipping tires to recycling or fuel processors over stockpile operators.
- The County could develop a separate wood waste grinding operation, with the ground materials sold as mulch or composting additive. Tipping fees charged for source-separated wood waste could be reduced to reflect only grinding costs in order to encourage residents to bring their waste wood to the landfill rather than burning or burying on-site.
- The County and Cities could incorporate building permit requirements which require builders to document the destination of construction/demolition wastes. These requirements would likely increase the flow of construction/demolition materials to the Central Landfill, and the increased quantities would make recycling selected streams more feasible.
- The County could investigate the feasibility of additional E-Waste sites especially in Central County and or special collection days.

#### 4.5.5 Organic Materials

Alternatives for organic materials include:

- The County could continue to encourage home composting as a waste prevention method, as discussed in Chapter 3 – Waste Prevention and Chapter 5 - Organic Wastes and Composting

### 4.6 Recommendations

Recycling recommendations were developed by the County SWAC Comprehensive Plan Subcommittee during a meeting in May 2011.

Recommendations, including implementation responsibilities and procedures are discussed below. Implementation and operation timeline schedules are provided in Table 4-3. County staffing requirements are expressed in “Full Time Equivalents” (FTEs), where 0.1 FTE is equal to 180 hours of staff time per year.

**Recommendation 4-1: Recycling Potential Assessment (RPA).** The County may perform an RPA during the planning period to determine potential adjustments in County recycling programs. The results of each assessment will be reviewed with the

SWAC to determine how to best implement recommended programs or adjustments in the range of materials recycled by the County.

**Recommendation 4-2: Additional Recycling Sites.** The County SWAC will work to develop additional partnerships for expanded recycling drop-off sites in under-served areas of the County. Expanded drop-off sites could include either permanent or mobile drop-off programs.

**Recommendation 4-3: Optional Source separated or co-mingled recycling.** The SWAC could work with the Cities with adequate densities and access to recycling processing facilities are encouraged but not required to implement source separated or co-mingled recycling collection.

**Recommendation 4-4: Construction/Demolition Materials.** The County, with the support of the SWAC, will determine whether additional diversion alternatives are feasible for managing construction/demolition materials such as concrete, asphalt, and clean wood.

**Recommendation 4-5: E-Waste.** Additional sites and or special collection days need to be established in the Central and Eastern parts of the county.

**Recommendation 4-6: Commercial Recycling.** The County will review its recycling processing capacity to determine whether additional commercial materials can be handled at the Central Landfill recycling facility. If capacity is available, the County will encourage local haulers to provide expanded cardboard, and possibly office pack, collection, to area businesses and institutions.

**Recommendation 4-7: Recycling Funding.** The County will continue to provide support at a level of \$80,000 to \$100,000 per year to support recycling facilities and programs. The County, with assistance from the SWAC, will determine how this level of funding can be best leveraged to increase diversion during the planning period.

**Recommendation 4-8: Market Development.** The County, Cities, and the Colville Tribe will research and recommend purchase of recycled-content products (e.g. copy paper, tissue paper, construction materials) to the extent practical and consistent with other purchasing objectives.

**Table 4-3: Implementation and Operation Timeline**

Recommendation	2011	2012	2013	2014	2015
R4-1 Recycling Potential Assess					
R4-2 Additional Recycling Sites					
R4-3 Optional Source separated recycling					
R4-4 C/D Materials					
R4-5 E-Waste					
R4-6 Commercial Recycling					
R4-7 Recycling Funding					
R4-8 Market Development					

**Table 4-4 Cost (Staff Hours/Cost in Dollars)**

Recommendation	2011		2012		2013		2014		2015	
	Staff	Cost	Staff	Cost	Staff	Cost	Staff	Cost	Staff	Cost
R4-1					480	60,000			340	42,500
R4-2	24	3000	24	3000	24	3000	24	3000	24	3000
R4-3	25	3125	N		N		N		10	1250
R4-4	N		N		24		3000		N	
R4-5	N		10	1250	N		15	1875	10	1250
R4-6	N		10	1250	N		N		N	
R4-7	10	1250	10	1250	10	1250	10	1250	10	1250
R4-8	5	625	5	625	5	625	5	625	5	625



**Chapter  
5****Organic Wastes & Composting****5.1 Organic Waste****Introduction**

In Okanogan County, organic wastes comprise one of the single largest recyclable components of the disposed waste stream. A separate chapter on Organic Wastes highlights the role that organic wastes diversion could play during the next planning period and provides a structure for the County to take a proactive approach in addressing potential issues. Included in this chapter are estimates of the quantity of organic wastes disposed of, reviews of applicable regulations, an examination of the types of organic wastes processing technologies, and discussions on the need to encourage proper organic wastes handling and storage to improve water quality and salmon recovery efforts, as well as marketing the end product of composting.

The types of organic wastes addressed in this chapter include: Yard Debris, Food Waste, Land Clearing Debris, Biosolids and Agricultural Waste. For each type of organic wastes, the existing conditions are documented, needs and opportunities are discussed and alternatives are presented.

**5.2 Definitions**

Composting is defined in Chapter 173-304 WAC, Minimum Functional Standards for Solid Waste Handling as: a biological process requiring “the controlled degradation of organic solid waste, yielding a product for use as a soil conditioner.”

Type 1 feedstocks are defined as: wood waste, source separated yard and garden wastes, agricultural crop residues, manure from herbivorous animals, pre-consumer meat-free food waste, and other source separated specialty waste that the jurisdictional health department considers to be relatively low in hazardous substance, human pathogens and physical contaminants.

Type 2 feedstocks are defined as: biosolids, wastewater treatment solids, septage, meat and post-consumer source separated food waste, and other source separated specialty waste that the jurisdictional health department considers to be relatively low in hazardous substance and physical contaminants, but are likely to have high levels of human pathogens.

### 5.3 State Legislation, Regulations and Guidelines

Unlike some other states, Washington does not have a separate regulation dedicated to compost facilities. Regulations for compost facilities are addressed by:

- Solid Waste – permitting handling facilities
- Water Quality – stormwater runoff, leachate
- Air Quality – odor issues
- Land Use – siting issues

In addition to these areas of regulation, other state, local and federal requirements may apply to a facility depending on its location and construction plans. Under the State's water quality regulations, compost pads are required for active composting and curing areas of all facilities regardless of feedstocks in areas of the state with wet climates. Leachate collection ponds must have liners to protect groundwater. An organics processing facility must be permitted as a solid waste handling facility; it can get a recycling facility permit under WAC 173-304-300 for non-containerized composting in piles. Yard debris and food wastes are regulated as part of solid waste; biosolids and agricultural waste are regulated by other regulations. Once compost has been processed and meets either one of the grades of quality recommended in the Interim Guidelines for Compost Quality, it is no longer considered solid waste. Table 1 outlines various regulations and who enforces them.

**Minimum Functional Standards for Solid Waste Handling (MFS)**, Chapter 173-304 WAC, contains two sections that address composting based on the feedstocks processed: Section 300, Waste Recycling Facility Standards, and Section 420, Piles Used for Storage and Treatment - Facility Standards. In Washington State, jurisdictional health departments are responsible for permitting compost facilities under the Minimum Functional Standards and have the authority to decide under which standards, or combination of standards, compost facilities should be regulated. Other sections of WAC 173-304 apply as well such as 600, 405 and 407. Certain elements of the 420 standards also apply but would more stringently be required if food, garbage or biosolids were also used as primary or secondary feed stocks or if more than 10K cubic yards of leachate generating material were being processed at any one time. These permits are supplemental to their pre-existing solid waste handling operation permits.

**State Waste Discharge Permit** (Chapter 173-216 WAC) must be obtained if leachate is discharged to ground water or to a municipal sewage treatment plant.

**National Pollutant Discharge Elimination System Permit (NPDES)** must be obtained if industrial wastewater (leachate) is discharged to any surface water. The leachate must be treated prior to discharge according to All Known, Available, and Reasonable Methods of Prevention and Treatment (AKART). (Chapter 173-220 WAC). As part of the NPDES permit application, an engineering report needs to be submitted to the Department of Ecology which describes the leachate treatment options and disposal. (Chapter 173-240 WAC).

**General Regulations for Air Pollution Sources** was issued by the Department of Ecology in Chapter 173-400 WAC. These regulations work to control and/or prevent the emission of air contaminants statewide. The Northeast Washington Air Control Authority is responsible for enforcing this regulation.

Washington State Biosolids Management Rule (Chapter 173-308 WAC) applies to compost facilities handling biosolids. Like its federal counterpart, 40 CFR Part 503, the biosolids rule is self-implementing. This means that the basic requirements of the rule must be met regardless of the permit status of a facility. The state biosolids rule was adopted in February 1998 and gave regulatory authority to the Department of Ecology.

State Environmental Policy Act, Chapter 197-11 WAC applies to all new compost facilities during the permit application to an agency. All solid waste handling permits require SEPA review, which includes an environmental checklist.

**Table 5-1 State Regulations Applicable to Organic Compost Facilities**

State Regulation	Enforcement
Chapter 173-304 WAC, Minimum Functional Standards for Solid Waste Handling (MFS)	Washington Health District
Chapter 173-216 WAC, State Waste Discharge Permit Program	Department of Ecology – Water Quality Program
Chapter 173-220 WAC, National Pollutant Discharge Elimination System Permit Program	Department of Ecology – Water Quality Program
Chapter 173-240 WAC, Submission of Plans and Reports for Construction of Water Facilities	Department of Ecology – Water Quality Program
Chapter 173-400 WAC, General Regulations for Air Pollution Sources	Washington Air Pollution Control
Chapter 173-308 WAC, Biosolids Management	Department of Ecology
Chapter 197-11 WAC, State Environmental Policy Act	Lead agency responsible for SEPA compliance

## 5.4 Background

What organic materials are being discarded?

The 2009 municipal solid waste totals for Okanogan County was 28,546 tons. The County has not separated yard and food waste in the past, so no volumetric data is currently available for use. The total tonnage of municipal solid waste includes all waste except tires, metals, petroleum contaminated products, and asbestos. In order to approximate the levels of Organic Waste, we have used the per capita percentages as published by the EPA in 2008. Compostable organic wastes would account for almost 32.5 percent of all waste received at the Okanogan County transfer stations (12.7% food scraps, 13.2% yard waste, and 6.6% land clearing – percentages by weight). Table 2 shows a breakdown by material type of approximately how much is discarded each year.

**Table 5-2 Okanogan County Organic Wastes Disposal Estimates\***

Organic Material	Amount Disposed At Transfer Stations
Yard debris	3,768 tons
Food waste	3,625 tons
Land clearing debris	1,884 tons
* Based on 2008 EPA per capita percentage– municipal solid waste totals.	

## Composting Facilities

Currently no organic wastes composting facilities are permitted in Okanogan County.

## 5.5 Discussions of Organic Wastes

The following sections provide a brief discussion for each organic type of material. Existing conditions are documented, needs and opportunities are reviewed and alternatives are presented.

### 5.5.1 Yard Debris

#### Residential Yard Debris

Yard debris is different from other recyclable materials in that it can be managed and used at home by residents. The County actively promotes home composting and grasscycling as a waste reduction method as described in the chapter on *Waste Reduction*. Home composting avoids the economic and environmental costs of operating collection systems and centralized processing facilities. However, not all residents have the ability or desire to compost their yard debris and/or other organic wastes at home. For those residents, collection services may play a role. Yard debris is a well-defined component of the waste stream and is easily handled by existing collection equipment. Yard debris is currently not collected separately in Okanogan County.

In order to start an urban residential yard debris collection program, the County would have to provide additional collection bins and provide for separate collection times or trucks. This will have to be analyzed to see if such an effort is economically cost effective. A majority of the residents in the County reside in rural areas where yard waste is either composted or burned including within City limits. County provided composters and education programs will also need to be assessed for economic feasibility.

The Boy Scouts of America, in many communities, have voluntarily collected trees after Christmas to dispose of the waste. This is usually done in coordination with the County involved. This has typically been accomplished on a limited basis in Okanogan County.

#### Rural Residential Yard Debris

Rural yard debris is often managed very differently from urban yard debris. Large lot sizes and different attitudes result in different management methods such as burning and backyard composting. Self-hauling is done to some degree, particularly in the denser areas close to the Urban Growth Boundary. No residential collection services for organic wastes are offered in rural areas.

#### Non-Residential Yard Debris

There is currently no tracking or data collection mechanism in place for non-residential yard debris collection in Okanogan County. Some large institutional generators of yard debris, such as schools, cities, parks, may self-haul their yard debris to centralized facilities, or, in some cases, practice on-site composting. Businesses often have yard maintenance services that haul the debris to composting operations.

### Needs and Opportunities – Yard Debris

Opportunities for co-collection, such as collection of garbage or food waste and yard debris in separate compartments of one vehicle, could be further explored when County or city collection contracts expire or are renewed. Changes in the collection system might lower the cost of collection and/or allow more efficient collection of additional materials. In order to co-collect residential food waste with yard debris, expanding yard debris collection to all residential garbage customers in the Urban Growth Area with the option of weekly collection could be considered.

### Discussion of Alternatives – Yard Debris

1. *Review yard debris collection programs to ensure that advancing technologies in commingling and co-collection are pursued to the fullest extent possible to minimize program costs and maximize diversion.*

The opportunity exists to explore potential cost savings due to collecting garbage and yard debris using the same truck. A consideration would be to examine a potential ordinance for yard debris curbside collection. If the cost estimate is competitive it may benefit the County to work with a certificated hauler to provide yard debris collection.

2. *Continue and expand coordination with other agencies for educational and technical assistance programs that offer alternatives to open burning.*

Urban locations within the County may soon be affected by a burn ban. The County should work with the SWAC to proactively promote alternatives to burning to assist the affected parties. There are several options that could be considered for supplying yard debris management alternatives to these areas. First, the County may want to establish a rural drop-off location where rural generators can drop off source separated brushy and woody materials. Grass clippings and other green yard debris would not be included due to the odor generating potential. Second, curbside collection options for yard debris could be made available in all areas affected by the burn ban non-attainment area. Options include:

Provide curbside collection within the burn ban area. Negotiations will need to take place to determine a fair cost of service. There may be the need for an urban and a rural pricing.

Coordinate with a certificated hauler to provide yard debris service in the burn ban area outside of the service area.

The County, the SWAC and the hauler could work together on educational efforts in the newly expanded area. Promotional activities may include direct mailing, a collection

guide and calendar, development and distribution of brochures and grade school promotional activities. Success of the promotions can be measured by tracking subscription rates in specific areas.

### 5.5.2 Food Waste

Okanogan County is committed to beginning an economical recycling plan. Currently the County is not providing for a community recycling program. Private companies primarily accept residential paper, cans, bottles, yard debris, business recycling paper, cardboard, paper and metal. Food waste still remains in the waste stream; County programs have not targeted food waste as a recoverable material. To meet the State and County recycling goal of 50%, food waste programs should be considered.

Food waste is a broad, general term. It includes both “*pre-consumer*” and “*post-consumer*” food waste. For composting purposes, food-contaminated papers that have no recyclable value but are compostable, are often included in with “food waste.” “*Pre-consumer*” food waste refers to materials that have no or low probability of having been exposed to human or other pathogens. Examples include meat scraps from butcher shops, grocery store meat departments, households vegetable trimmings from produce warehouses, grocery stores, restaurant or household salad prep areas, and excess bakery products.

“*Post-consumer*” food waste refers to organic materials that may or may not have been exposed to human or other pathogens and are regulated more strictly. Examples include plate scrapings, salad or food bar leftovers, contaminated paper towels and tissues. For composting facility purposes, materials listed as pre- and post-consumer are further classified as Type 1 or Type 2 feedstocks (see [Definitions](#) section at the beginning of this chapter). Currently, no facilities are permitted in Okanogan County to handle post-consumer food waste or Type 2 feedstocks.

**Pathogen reduction.** The composting process must reduce pathogens to numbers that eliminate the danger of transmitting disease through the finished product. Pathogens are disease-causing organisms, including bacteria, viruses, fungi, helminthes, and protozoa and are found within living organisms and at background levels in the environment. Healthy humans and animals are immune to pathogens at background levels, but they may be susceptible to disease when pathogens are present in higher quantities. Pathogen destruction is achieved in the composting process by using the Process to Further Reduce Pathogens (PFRP) required by federal regulations. Composting PFRP is defined in the federal regulations (40 CFR Part 503 dated February 19, 1993, Appendix B, item (B) (1)) as maintaining specific temperatures for certain periods of time for different types of composting methods of sewage sludge. While PFRP was originally developed for composting sewage sludge, it has been widely applied to solid waste composting.

Composting is not the only waste diversion option of recovered food waste. Some pre-consumer food wastes and food processing by-products can be used by food banks, used for animal feeds or turned into other animal feed products by using processes other than composting.

In Okanogan County, an estimated 3,625 tons of food waste (12.7 percent of the overall municipal waste) are thrown into the garbage each year. Food scraps can be composted and turned into a soil amendment called compost. Vermicomposting

(using worms to compost food scraps) avoids the economic and environmental costs of operating collection systems and centralized processing facilities.

### **5.5.3 Residential Food Waste**

Currently there is no residential collection of food waste. Some homes compost food scraps in their backyard using worm bins, compost bins or incorporating the food waste directly into trenches in their gardens. Other households dispose of food waste down sink garbage disposals or in the garbage can.

### **5.5.4 Non Residential Food Waste**

Commercial food waste includes organic grocery debris (unsalable fruits and vegetables, vegetative trim, wax coated cardboard), restaurant organics (food prep, table scraps, soiled and non-recyclable paper), and food processing wastes. Businesses dispose of food waste in a variety of ways: donating to food banks, down garbage disposals, through rendering services, to farmers for animal feed, or to processors for animal feed production.

#### **Needs and Opportunities – Food Waste**

The County currently lacks a permitted processing facility to handle Type 2 feedstocks and post-consumer food wastes. Given the need for a greater level of odor and health control than provided by open windrow composting, the use of an enclosed facility or an in-vessel process should be encouraged. This will significantly increase facility capital costs. Vermicomposting may provide a cheaper alternative because it does not require large capital investments. With proper care, vermicomposting does not attract rodents or fruit flies, is relatively odor-free and involves almost no noise. The drawback to vermicomposting is the limited amount of tonnage that can be processed.

### **5.5.5 Residential Food Waste**

Post-consumer food organic wastes collection is more common in Canada and Europe, where composting is viewed as a diversion method unconstrained by sometimes unstable and/or distant commodity markets. Canadian food organic wastes collection programs generally recover between 6 and 8 kilograms (13 to 18 pounds) per household per week. It should be noted that a percentage of this recovery is mixed waste paper, such as boxboard, that is used to bulk food wastes and retain liquids. Recovery in areas with mixed paper recycling programs would be lower. If an Okanogan County urban area residential organic wastes collection program were fully implemented, a total organic wastes stream of approximately 10,000 tons could be recovered. Cost estimates indicate that the least expensive way to collect residential food is from only yard waste customers who would place their food waste directly in their yard waste container. Okanogan County could consider incorporating food waste collection with yard debris collection.

### 5.5.6 Non-Residential Food Waste

Non-Residential food waste includes food and non-recyclable paper wastes from: grocery stores, school cafeterias, hospitals, large businesses with cafeterias, prisons, restaurants, caterers, bakeries, processed food manufacturers, etc. Due to the large quantities of organic wastes generated by food-specific businesses, there is a potential that a portion of the food waste could be economically collected and diverted to composting. Food waste collection programs should initially focus on non-residential food waste recovery. Targeted programs for these sectors would yield the highest diversion at the lower cost. Solid waste staff should identify and survey restaurants, groceries and institutions to determine the quantities of organic waste and the most efficient, economic and environmental way to handle that waste. In regards to food processors, solid waste program staff could conduct a survey to determine the type processing waste and how it is currently handled. Site visits and waste analysis should be offered.

#### Discussion of Alternatives – Food Waste

3. Evaluate food waste collection and processing to meet recycling and diversion targets.

### 5.5.7 Residential Food Waste

The evaluation of implementing residential food waste collection programs will include an assessment of availability and costs of specialized composting capacity, household containerization requirements and the degree of change to existing collection systems required to implement food waste recovery. Several barriers exist to implementing this type of program. Collection systems could be significantly changed, with household containers provided to each residence. Successful organic wastes collection programs often use alternating week collection, with organic wastes collected one week and residential wastes collected the next week. This represents a substantial change from the solid waste collection systems known and expected by residents. Garbage and organic wastes (either all organics or yard debris only) could also be co-collected weekly by a split packer truck. Co-collection results in the two materials being dumped at the same end-location, which could require reloading and transport of the organics to another location for composting. Finally, the successful implementation of organic wastes collection requires an intensive education effort far beyond that required to implement user-pay curbside recycling.

### 5.5.8 Non-Residential Food Waste

Non-residential food waste diversion will continue to be encouraged, where appropriate, by County technical assistance programs and private collection companies. Table 3 examines possible alternatives to landfilling food waste.

**Table 5-3 Alternatives to Landfilling Food Waste**

Food Donations	Nonperishable and unspoiled perishable food can be donated to food banks, soup kitchens, shelters, and other charitable organizations.
Animal Feed	Some types of food discards, such as inedible produce, can be used directly as animal feed. Other types such as baked goods can be converted into a high-quality pelletized poultry food.
Rendering	Meat products and cooking oils can be used in the rendering industry and converted into animal food, cosmetics, soap, and other products.

Composting	This method offers a range of options, from aerated windrows, where organic wastes are formed into long piles, to in-vessel composting, where waste is enclosed in a temperature and moisture-controlled chamber, to vermicomposting, which uses worms to break down materials.
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To promote the concept of composting food waste on site with a small-containerized mixing machine, the County may consider providing a rebate incentive or no interest loans to individual food businesses that purchase and operate an in-vessel composter. These options may provide the incentive to purchase on-site composting systems.

Information on food processing facilities could be compiled in cooperation with the Washington Health District and the Department of Agriculture. An analysis would then be performed to see if processing waste handling methods are most cost effective and environmentally sound. Programs based on economic incentives should be offered.

Note: Local health departments have the authority to decide how food waste composting systems are regulated under the Minimum Functional Standards for Solid Waste Handling, Chapter 173-304 and 173-351 WAC, or under a local solid waste ordinance.

**Table 5-4 Existing Technologies to Compost Food Waste**

Technology	Remarks
Windrows	Not recommended for handling post-consumer food wastes or Type 2 feedstocks.
In-Vessel (containerized) – on-site small scale	Capable of handling small amounts of food wastes. The site employees need to understand that proper composting of food scraps requires a scientific approach. A responsible employee will need to track and record the amount of food put in each day, the temperature of the system, the proper bulking mix, etc., in addition to feeding the system.
In-Vessel (containerized) – commercially permitted, large scale	A typical in-vessel composting system is a portable unit, designed to biodegrade feedstocks in batches. It consists of a composting compartment that has forced aeration, leachate collection, and usually some kind of air emissions control device, such as a biofilter, attached to it. Feedstock materials are pre-mixed and loaded into the composting container where they are allowed to compost for a specific amount of time. 25 tons per day of pre and post-consumer food waste can be composted in fifteen 40-cubic yard in-vessel units. In-vessel composting systems regulate heat, moisture and air volume to rapidly decompose organic wastes. Odors are fully controlled using biofilters and since the vessels are enclosed, there are no vermin, no groundwater contamination and no leachate problems.
Vermicomposting (earthworms) – commercial 100 foot continuous flow reactors	A raised vermicomposting bed measuring over 100 feet in length, 8 feet wide and is 3 feet deep costs \$50,000 to construct including the cost of one ton of worms. A gantry feeder, riding on rails fixed to the top of the plywood sides feeds the worms up to 6000 pounds (3 tons) per day. A chain-driven breaker bar mechanically scrapes vermicompost from the raised mesh floor, allowing the finished

	<p>material to fall off the floor under the unit. A recovery scraper then moves the vermicompost from one end of the reactor for collection at the other end. Vermicomposting systems must be maintained at temperatures below 35°C and moisture content between 70 and 90 percent. Thus careful management of the wastes is required. Because earthworms consume organic material in a relatively narrow aerobic layer of six to nine inches, the key to successful vermicomposting lies in adding organic wastes to the surface in successive, thin layers at frequent intervals, so that any thermophilic heating that occurs does not become excessive. Earthworms are very sensitive to ammonia, salts and certain other chemicals and die when exposed to wastes containing more than 0.5 milligrams of ammonia per gram of waste or more than 0.5 percent salts. However ammonia and salts can be washed out of organic wastes or dispersed through precomposting.</p>
Bioconversion	<p>A model plant is in operation on Mitchell Island in Vancouver, BC. The fully contained plant can process 400 tons per day of food waste with the end product sold as a fertilizer ingredient or as a livestock feed supplement. The system has a total processing time of less than 30 hours and can be located in urban industrial parks near the source of raw materials. A wide array of organic wastes can be processed including food waste, sewage biosolids and animal wastes from intensive livestock production units. The plant site, less than 1.5 acres in size, includes a 600-ton per day plant, a truck weigh scale, and truck turning area and vehicle parking.</p>

### 5.5.9 Land Clearing Debris:

Land clearing wastes contain natural vegetation and earthen materials from land clearing and grubbing activities usually associated with construction and agricultural development. Land clearing debris sometimes becomes mixed with, or, contaminated by demolition and other waste materials present on the site that is being cleared. For the purposes of this Plan, land clearing waste includes stumps; brush; vines; tree branches; mud; soil; sod; rocks; boulders and similar materials.

Prior to the early 1990s, woody land clearing wastes were either landfilled or burned. Burning of land clearing wood wastes is currently allowed in a majority of Okanogan County. Increasingly land clearing waste is either ground and distributed as mulch on-site or trucked to local or regional wood waste processors, particularly in the more urban areas of the County. Land clearing wastes that can be chipped for mulch or composting include wood, brush, tree branches and stumps. Several public agencies and private developers are already doing this. Wood and vegetation can be composted or shredded for hog fuel, wood pellets or ground cover, using specialized chipping and shredding equipment. Stumps and large bulky wood materials present special handling problems. The inert material, especially soil, is typically recovered or left on-site as topsoil and fill.

#### Needs and Opportunities - Land Clearing Debris

Revisions to WAC 173-304 may prohibit the burning of land clearing debris in parts of Okanogan County. The affected areas will have a need for alternative disposal methods including drop-off or chipping options (discussed in Yard Debris section).

#### Discussion of Alternatives - Land Clearing Debris

See Yard Debris Section under Rural Residential Yard Debris.

### 5.5.10 Biosolids

Biosolids are not regulated as part of the solid waste stream, but can be an acceptable feedstock for composting at a facility that has met solid waste permitting requirements.

#### Needs and Opportunities - Biosolids

Any compost facility incorporating biosolids as a feedstock is subject to the State's requirements in Chapter 173-308 WAC, Biosolids Management. This includes keeping records, maintaining proper temperatures and duration of composting for pathogen control and vector attraction reduction, and testing the final product. Like its federal counterpart, 40 CFR Part 503, the biosolids rule is self-implementing. This means that the basic requirements of the rule must be met regardless of the permit status of a facility.

Several management alternatives are available for the treatment and disposal of biosolids. These include:

Composting, either alone or with other organic wastes, such as wood waste, yard debris and/or food wastes;

Land application of biosolids onto certain types of agricultural lands (i.e., ornamental crops and certain food crops);

Silvicultural application of biosolids to forested lands;

Application of biosolids for land reclamation;

Incineration of sludge;

Landfilling of sludge or disposal in a surface impoundment; (Sewer sludge is not allowed at Okanogan County Central Landfill per Conditional Use permit)

Composting biosolids with other organic wastes, such as food waste, could combine two or more potentially troublesome waste streams, simultaneously reducing the amount of waste requiring disposal and producing a useful product. Biosolids composting, using a bulking agent, such as wood chips or yard debris, is being successfully done throughout the Pacific Northwest.

In recent years, efficient and large-scale vermicomposting systems have been developed. The methods range from relatively low-technology systems that use manual loading and collection methods to large (128 feet long, 8 feet wide and 3 feet deep) completely automated and hydraulically driven, continuous flow reactors. Labor requirements are minimal and the cost of the reactor is recouped in one to three years. A 1,000-ton-per-year reactor can be built for \$25,000 - \$50,000. In addition to savings from avoided waste disposal costs (land application or landfilling costs), the economics of vermicomposting become even more attractive if the process produces a value-added horticultural plant growth medium with considerable commercial value. Extensive plant-growth trials at Ohio State University have shown that substituting vermicompost for 10 to 20 percent of the best horticultural plant growth media increased rates of germination, growth, flowering and fruiting of a wide range of ornamental and vegetable crops.

If a pilot program proves successful, the project could be expanded to a large-scale vermicomposting system. In addition, the County will remain open to possible new technologies.

## Discussion of Alternatives - Biosolids

5. *Support the request for delegation of authority to the Health District or other appropriate local agencies that would give priority to health concerns in the regulation of biosolids utilization.*

The State biosolids rule was adopted in February of 1998. The rule took biosolids out of the solid waste stream and removed it from the regulatory authority of the local health district and into another regulatory structure administered by the State Department of Ecology. Jurisdictional health departments may still be actively involved in regulating biosolids under the State program if they have received delegation of authority from Ecology. The SWAC has expressed a preference for local agency regulation of biosolids.

### 5.5.11 Agricultural Wastes

Agricultural wastes are regulated in Washington under WAC 173-304 and in Oregon under OAR94-040. Most agriculture waste generated in Okanogan County never enters the waste stream; it is most often disposed on-site. There is limited data on the specific types and quantities of livestock that produce wastes or on the farm acreage and crops being cultivated in the county and cities. The three principal methods for disposing of agricultural wastes on-site are:

Land application (manure and crop residue);

Burning (trimmings and crop residue);

Use as animal feed (crop residue).

**Manure** can be land-applied in two ways. It can be left in the field where it was produced by grazing animals, or as in the case of dairy farms and stockyards, large amounts of manure are collected and temporarily stored before land application. However, limited storage capacity often results in the manure being prematurely applied to the land in wet weather, when the ground surface is saturated. These conditions inhibit absorption of the manure into the soils and increase the chances for runoff into surface waters. Manure-contaminated runoff can spread pathogens and degrade water quality by adding excess nutrients. Generally, a dairy farm that discharges manure or contaminated runoff to rivers, lakes, marine waters or groundwater more frequently than during extreme weather conditions is required to obtain a permit. The federal Clean Water Act and 1998 Dairy Nutrient Management act both require dairy farms discharging pollutants to obtain a dairy waste permit from Ecology.

Concentrated Area Feed Lots (CAFL), which generates large amounts of manure in a small area, will be subject to a new set of rules from EPA.

**Crop residue** is applied to the land by plowing the residues back into the soil. Crop residues can also be used as animal feed (silage) and can include corn, grains and field crops. In addition, many crop residues can be an important source of food for birds, waterfowl and small animals. The amount of agricultural waste generated in Okanogan County is difficult to determine. Most agricultural wastes are currently disposed on-site.

## Needs and Opportunities - Agricultural Wastes

Agricultural waste generators need to be better educated about the risks associated with agriculture-related practices and the disposal techniques and resources available to manage these wastes. Ecology has implemented a water quality control program that requires people involved in certain agriculture-related land use activities, such as dairy farming, to obtain National Pollutant Discharge Elimination System (NPDES) wastewater discharge permits. The wastewater discharge permit requirement became effective in January 1992. The U.S. Natural Resources Conservation Service provides engineering support, management guidelines and technical assistance to dairy farmers who apply for these permits.

There is a need for programs to help farmers compost their own wastes, both for their own economic benefit (including liability) and to protect water resources from contamination. The U.S. Natural Resources Conservation Service and the Washington State Cooperative Extension Corps are available to assist in implementing proper waste management practices in the County and cities. Composting organic material for use on your own farm is exempt from solid waste regulations. On-farm composting requires a solid waste-handling permit when the feedstocks include municipal and/or industrial wastes generated off the farm and the end product is sold or distributed commercially. Dead animals can also be an issue. Depending on the number and/or size of the carcasses, proper disposal options vary (see *Special Wastes* Chapter). Note: the Health Department makes the decision on whether or not a particular operation requires a solid waste-handling permit.

The Department of Ecology does recommend that small farms set up cooperative composting sites which would involve bringing manure and crop residues from one farm to another. In setting up cooperative composting farmers should: limit feedstocks to crop residues and manure; follow design standards promoted by the Natural Resources Conservation Service; and work with local Conservation District personnel. In accordance with RCW 70.94.640, odors from agricultural activities, consistent with good agricultural practices, are exempt from air pollution requirements. Okanogan County should encourage and support private sector efforts for the continued proper management of agricultural wastes. The County and cities could also support and facilitate efforts to minimize land disposal of these wastes by promoting composting opportunities and by developing new markets for the end products. In addition, local governments could support research and encourage agricultural waste generators to seek grants for implementing innovative handling and disposal methods.

### Discussion of Alternatives - Agricultural Wastes

6. Coordinate with other agencies for the continued measurement of agricultural waste. Other agencies, such as the Dept. of Agriculture and Ecology maintain lists of permits and required data for farms which generate manures and other types of agricultural waste. Additional data collection and measurement by the County may be redundant. Existing permit data may be sufficient for the exploring and implementing innovative handling and utilization methods.
7. Encourage the use of manure and other readily compostable organic agricultural wastes for use in a composting facility.

The County should provide technical assistance and education to support manure and crop reuse and composting. Assistance could include site assessment, permitting, compost recipe development, quality control assistance, feedstock sourcing and assistance in public relations and marketing.

### **5.5.12 Compost Marketing**

Most of the discussion in this chapter has focused on the collection and processing of organic wastes. Recycling and composting is a three-step process: collection; processing; and marketing the new product back to the consumer.

#### **Needs and Opportunities**

If the County expects increasing quantities of organic wastes to be collected and processed into compost, it should participate in developing increased markets for the resulting compost products. Compost is a valuable soil amendment with many beneficial uses including:

- Providing organic matter, restoring biological activity;
- Improving soil structure, increasing infiltration and permeability;
- Supplying slow-release nutrients to plants;
- Stabilizing soil pH;
- Suppressing soil-borne diseases and plant pathogens;
- Reducing the need for pesticides and fertilizers;
- Increasing water retention in both clay and sandy soils (compost can hold moisture up to 20 times its weight);
- Removing solids, oils, grease and heavy metals from stormwater runoff;
- Preventing pollutants in storm-water runoff from reaching water sources; and
- Preventing erosion and silting on embankments adjacent to creeks, lakes and rivers.
- Expanding compost use in road projects and other County and city applications;
- Using compost in controlling erosion as sediment fences and wood fiber hydromulch;
- Promoting the use of compost for application on right-of-ways throughout the County;
- Exploring the practicality of using leaf compost pellets in patented stormwater treatment filters.

### **5.5.13 Recommendations:**

The County Solid Waste Advisory Committee (SWAC) reviewed composting recommendations during a meeting in September 2010.

**Recommendation 5.5-13 -1:** The County will continue to investigate economically feasible opportunities for organics and will keep the SWAC informed of any new processes which might be beneficial.

## COMPOSTING

### 5.6 Introduction

The solid waste management activities discussed in this chapter are organized into three sections based on the type of material to be composted:

- 2 Yard Debris Composting Programs
- 3 Food Waste Composting Options
- 4 Solid Waste Composting Options

Section 2 discusses current activities and potential options for composting yard debris. Sections 3 and 4 discuss the potential for new programs to divert food waste and compost mixed garbage, respectively.

#### 5.6.1 YARD DEBRIS COMPOSTING PROGRAMS

#### 5.6.2 Existing Conditions

##### Background

Composting can be defined as the controlled biological decomposition of organic materials to produce a beneficial product (compost). Compost has many applications, but as a soil amendment it provides organic matter and nutrients, loosens tightly-packed soils, and helps retain moisture. In this SWMP, yard debris is defined to include lawn clippings, leaves, weeds, and tree prunings. Because prunings are included in the definition of yard debris, “composting”, as used here, includes the chipping of brush.

##### Collection Methods

Rural residents are currently disposing of most of their yard debris individually. Many rural residents of the County use on-site composting (“backyard composting”) or residential incineration. Backyard composting is considered to be a waste reduction technique. Other collection services for yard debris include curbside collection program or drop-off at a County transfer station. Materials that could be collected include leaves, grass clippings, and branches. Branches should be less than four inches in diameter, and in bundles that are less than four feet long, less than two feet in diameter and that weigh less than 40 pounds. Christmas trees should also be collected in the first full week of January. The known tonnages of yard debris collected in recent years are shown below.

##### Processing System

Yard debris can be ground (in the case of wood materials) and mixed with the biosolids to serve as a “bulking agent”. By itself, the biosolids would not compost well. The yard debris adds structure and absorbs some of the moisture present in the biosolids, thus allowing the mix to be formed into piles for composting and also adding porosity that improves aeration (the microorganisms that cause composting to occur require oxygen

to operate most efficiently). The end result of the composting process is a soil-like product that is tested and then sold to the general public and private contractors. Sales can be conducted in by the truckload at the Compost Facility. Several batches of compost can be produced annually and sold fairly quickly during most of the year.

The location and operation of the Compost Facility is the subject of consideration for a lease between the County and other agencies. The County cannot develop new facilities at the existing landfill for the Compost Facility and must look elsewhere. The land for the facility needs to be near decent modes of transportation such as rail and highway access. The existing lumber mill located on the east side of Omak on the Colville Indian Reservation is nearly ideal, as it allows locating major waste management components (Transfer Station, Recycle Center and the Compost Facility). Locating these facilities together maximizes ease of administration, leads to efficient transfer of materials between facilities, and allows the common use of the buffer area for the old landfill. This arrangement also provides a facility for the cost-effective disposal of biosolids. In return for the use of the land, the County would agree to be wholly responsible for the operation of the facility and mitigation of any direct impacts it may cause. A partnership agreement would need to be agreed on to make these efforts a reality. The facility would provide jobs for the Colville Tribe as well as County employees. Revenues would be shared with all parties involved in order to improve the economy of the County and keep revenues local.

### **5.6.3 Needs and Opportunities**

There are several needs and opportunities associated with composting in Okanogan County. The amount of yard debris remaining in the County's waste stream is not precisely known, but it can be assumed that there is plenty of material that could be composted. The available waste composition data indicates that there is about 3,768 tons of yard debris in the waste stream.

One potential opportunity is the increased amount of yard debris that may become available when or if a burn ban becomes effective in the cities of Okanogan County. This may actually help address another need, which is that most Compost Facilities are chronically short of wood material to serve as a bulking agent. The County could use more of this material to maximize the capacity and productivity of their operation, especially to maximize the facility's capacity for septage.

Additional areas of the County may come under a burn ban if an area achieves a population density of 1,000 people per square mile. Public education can be considered to be an ongoing need, to maintain the current successes as well as increase the amounts of material diverted to composting. Especially if a burn ban is phased in, it will be important to educate people on the preferred handling methods for yard debris.

### **5.6.4 Alternative Methods**

Private individuals are encouraged to process yard debris residentially. The County could also set up a drop-off container at transfer stations. Several issues would first need to be addressed before collecting yard debris at the transfer stations. Fire hazards could be a concern and could require special designs or operating requirements. Drop boxes filled with yard debris may not be efficiently hauled due to the bulky nature of

some materials (such as brush), and there would also be costs and other factors to consider.

An additional but more drastic method of increasing the level of yard debris diverted from the solid waste stream would be a disposal ban. The disposal ban could take a variety of forms, but one approach would be to require that no yard debris be delivered to the Transfer Station. Some means of enforcement would be needed. Bans on placing materials into the municipal solid waste stream appear to be an unpopular option.

Local market demand should be sufficient for the compost product supply. There are certain seasons, however, when the demand for compost is lower and alternative end-markets need to be sought out. If the amount of compost increases significantly then additional market development may be necessary to avoid a surplus of finished product. The County could create demonstration gardens showing different means of composting as part of a local education program as well.

## **5.7 RECOMMENDATIONS**

The following recommendations are made for yard debris composting:

- The County should partner with an external agency to instigate composting operations. If the supply of compost increases above demand, the County should utilize the finished product on County properties and projects, when applicable.
- The County should build demonstration gardens in at least one of its parks and other locations to educate residents about the benefits of biosolids, vermin-composting, and/or yard debris composting. The County should work with local garden clubs or other groups to build and maintain these gardens.

## **5.8 FOOD WASTE COMPOSTING OPTIONS**

### **5.8.1 Existing Conditions**

Food waste could also be a candidate for composting. As other materials are diverted from the waste stream, food waste increasingly becomes one of the most prevalent materials left in the waste stream. Approximately 13 percent of the waste stream, or 3,625 tons per year, is food waste. Composting a portion of this would help the County meet its waste diversion goal.

### **5.8.2 Needs and Opportunities**

It is possible that food waste could be included in the mix that is processed at the Compost Facility, although the high moisture of this material would lead to even greater demand for (and potential shortage of) bulking agents such as yard debris. Other potential problems associated with large-scale food waste could include odors, vectors (insects and other vermin), and end-product marketability issues.

### 5.8.3 Alternative Methods

There is increasing interest in food waste composting throughout the United States. A national survey found that the number of food waste composting projects in operation or under development increased from 214 in 1997 to 250 in 1998. This survey also found that most municipalities were not pursuing residential sources of food waste (where instead backyard composting and/or worm bins were the main strategy), but were tapping into heavy concentrations of food waste found at institutional and industrial (food processing) sources.

### 5.8.4 Recommendations

The following recommendation is made for food waste composting:

- Small scale vermin-composting projects should be encouraged. Home composting of food waste should be encouraged with public education on the proper methods for vermin-composting or incorporation into compost bins.

### 5.8.5 Implementation Schedules and Costs

Encouraging school and home food waste composting activities should be conducted on an ongoing basis. The costs for this will be largely staff time (the Solid Waste Education Coordinator) and educational materials. This recommendation has been given a medium priority for implementation.

## 5.9 SOLID WASTE COMPOSTING OPTIONS

### 5.9.1 Existing Conditions

A third possibility for composting is to process mixed solid waste to remove non-degradable items and compost the remainder. There are very few solid waste composting facilities currently in operation in the U.S. This technology is more widely used in Europe, where there are many more facilities that have operated successfully for several years.

Solid waste composting typically involves a number of shredding, composting and screening steps to produce a material that is somewhat similar to yard debris compost. Waste processing is required on the front end of solid waste composting facilities, where it serves the purpose of removing materials that would interfere with the composting process or the marketability of the end product, as well as recyclable materials. Screening and other processing after composting is also required and the various processing steps create a residue that requires landfill disposal.

### 5.9.2 Needs and Opportunities

Solid waste composting requires careful attention to the markets for recovered products and the costs of construction and operation of the required facilities. The marketability of the recovered materials may be hard to determine at the design stage of the facility, since the quality of the materials cannot be certain until the facility is in operation.

There are no needs or opportunities that have been specifically identified in support of solid waste composting, although the increased diversion created would help meet the County’s goal for recycling. In the case of this technology, however, this increase in diversion would be relatively expensive, as the capital-intensive facility required for this approach causes a relatively high cost per ton for the materials recovered.

### **5.9.3 Alternative Methods**

There are various options for solid waste composting. In the simplest case, this method can be used for organic-rich waste streams from specific types of commercial waste generators. In the most capital-intensive option, a solid waste composting facility could include the County’s entire waste stream and would include more shredding or grinding of the incoming waste and more emphasis on removal of physical and chemical contaminants such as plastics and batteries. In any case, the actual composting step may take place in an enclosed system (typically called “in-vessel” composting), a trough that is open on top, or a variety of pile configurations.

The success of solid waste composting depends on the markets available for the end product and the cost of alternative disposal methods. Even in the best case, solid waste compost typically has much more limited applications than yard debris compost. Solid waste compost usually contains small bits of plastic and pieces of glass, since these do not break down in the composting process and even intensive shredding will only reduce them to a degree. These materials detract from the visual appearance of the compost and may cause potential customers to reject it. Concentrations of metals and other contaminants may also be a limiting factor in determining where and how the compost can be used. Hence, applications for solid waste compost are less likely to be found in urban locations, and this approach typically relies on agricultural or forestry applications. A complete cost analysis has not been conducted for this option, but the cost for solid waste composting would be very substantial.

### **5.9.4 Recommendations**

The County Solid Waste Advisory Committee (SWAC) reviewed recommendations during a meeting in September 2010.

### **5.9.5 Recommendations**

No solid waste composting facilities or programs are recommended at this time. Future proposals or opportunities should be evaluated on a case-by-case basis.

## **5.10 INTRODUCTION TO COMPOSTING METHODS**

Just a decade ago, most public officials and business owners thought of waste materials such as grass clippings, food scraps, and sludge as a problem they had to dispose of. But more and more often, public agencies and entrepreneurs are turning this former problem into a profit with environmental benefits.

Once they’re converted into compost, organic wastes—which are the compostable portions of the solid waste stream—can be used to mulch landscaping, enhance crop growth, enrich topsoil, and provide other benefits.

The change in outlook about municipal organic wastes stems from many factors:

- (1) Municipal officials have realized that composting is an effective strategy for managing waste (Seasonally the percentage up to 70 percent may be organic);

- (2) States have banned certain organic materials such as cardboard and yard waste from landfills;
- (3) Backyard composting has been readily accepted;
- (4) Composting has been heavily promoted in the agricultural sector; and
- (5) More markets for compost have opened up.

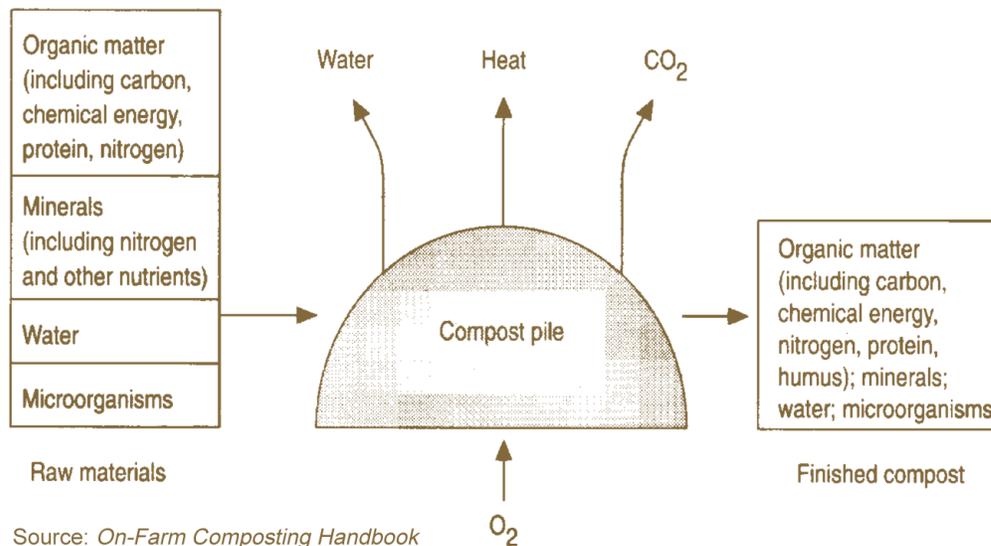
The key to starting a successful composting enterprise is to understand the basics, including how composting works, what types of facilities can handle this process, which raw materials work best, how to manage odor, and how to produce and market high-quality products. A cardinal rule of composting is to know your feedstock materials and physically evaluate the available resources prior to design.

### 5.10.1 Composting Basics

Composting is the aerobic decomposition of organic materials by microorganisms under controlled conditions into a soil-like substance called compost. During composting, microorganisms such as bacteria and fungi break down complex organic compounds into simpler substances and produce carbon dioxide, water, minerals, and stabilized organic matter (compost). The process produces heat, which can destroy pathogens (disease-causing microorganisms) and weed seeds.

Raw materials are composted fastest when conditions that encourage the growth of the microorganisms are established and maintained. The most important conditions include the following.

- Organic materials blended to provide the nutrients that support microbial activity and growth, including a balanced supply of carbon and nitrogen (C:N ratio)
- Sufficient oxygen to support aerobic organisms
- Moisture levels that uphold biological activity without hindering aeration
- Temperatures needed by microorganisms that grow best in a warm environment.



***The composting process.***

As soon as appropriate materials are mixed into a pile, the microorganisms set to work and the composting process begins. During this active stage, oxygen consumption and heat generation are at their highest levels. Then a curing period follows, in which materials compost much more slowly. Decomposition of organic material will continue until all of the nutrients are consumed by microorganisms and most of the carbon is converted to carbon dioxide. Before it reaches this point, however, compost is judged to be finished according to its intended use and factors such as C:N ratio, oxygen demand, temperature, and odor. Factors affecting the composting process include nutrient ratio, moisture content, oxygen concentration, pH, surface area, temperature, and retention time. Table 1 displays the desirable conditions for the composting process.

**Table 10-1. Desired Characteristics for the Composting Process**

Characteristic	Reasonable range	Preferred range
Carbon-to-nitrogen (C:N) ratio	20:1 - 40:1	25:1 - 30:1
Moisture content	40 - 65%	50 - 60%
Oxygen content	>6%	~16 - 18.5%
pH	5.5 - 9.0	6.5 - 8.5
Bulk density	<40 lbs. per cubic foot	—
Temperature	110 - 140° F	130 - 140° F
Particle size	1/8 - 2 inches diameter	Varies*

\*Depends on raw materials, pile size, and/or weather conditions.

**Nutrients.** Carbon (C) and nitrogen (N) are important nutrients needed by microorganisms in the composting process. Carbon supplies energy and growth, and nitrogen is used for protein and reproduction. Since nitrogen is also a major nutrient required for plants, its concentration affects the value of the compost. In general, about 25 times more carbon than nitrogen is needed by biological organisms, so it is important to provide the right ratio. Although good results can be achieved with C:N ratios from 20:1 to 40:1, the ideal ratio is 25:1 to 30:1 for active composting. Table 2 displays the average carbon-to-nitrogen ratios of certain raw materials.

**Table 10-2. Average Carbon-to-Nitrogen Ratios of Selected Materials**

Horse manure ..... 30:1	Sewage sludge..... 6-16:1
Swine manure..... 30:1	Food scraps ..... 15:1
Cattle manure..... 19:1	Broiler litter ..... 14:1
Grass clippings ..... 19:1	Vegetable wastes ..... 12:1
Turkey litter ..... 16:1	
<b>High Carbon Materials</b>	
Newsprint ..... 398 - 852:1	Paper pulp ..... 90:1
Corrugated cardboard..... 563:1	Leaves ..... 40 - 80:1
Sawdust, wood chips ..... 442:1	Fruit wastes ..... 35:1
Bark..... 100 - 130:1	

Source: Rynk, R. et al. On-Farm Composting Handbook, Northeast Regional Agricultural Engineering Service, NRAES-54, Appendix A, Table A.1, 1992.

**Moisture.** Microorganisms need water to support their metabolic processes and to help them move about. A moisture content range of 40 to 60 percent is recommended for most materials. Below 40 percent, microbial activity slows. It ceases below 15 percent. When moisture levels exceed 65 percent, air in the pore spaces of the raw materials is displaced by water, which leads to anaerobic conditions, odors, and slower decomposition.

**Oxygen.** The composting process consumes large amounts of oxygen. If there is not enough oxygen, the process slows, and odors may result. An oxygen content of 16 to 18.5 percent is ideal; at 6 percent or lower, odors are perceptible to even the least sensitive individuals. To increase oxygen for the composting process (aeration), the pile can be turned or aerated with force through blowers. Anaerobic conditions may be minimized by keeping piles at the right height; using a well-mixed, uniform feedstock; avoiding excess moisture; and turning and mixing the pile frequently.

The pH level is an indicator of the acidity or alkalinity of the composting material, measured on a scale from 0 (very acidic) to 14 (very basic), with 7 being neutral. Composting can work effectively between the pH levels of 5.5 to 9; however, the process is most effective between 6.5 to 8.0. A pH level below 6 can slow decomposition, and a level above 8 can cause the release of unpleasant-smelling ammonia. Insufficient oxygen is often the cause of low pH during the active composting stage, so increasing the aeration by turning the pile should raise the pH. It is not advisable to adjust the pH by adding limes and ashes because these materials can increase ammonia losses.

**Surface area.** Smaller particles of raw materials have more surface area, which make nutrients and energy more available to microorganisms. However, smaller particles can reduce the air space within the composting mass, so a balance is necessary; particle sizes ranging from 1/8 to 2 inches in diameter generally produce good results.

**Temperature.** Microorganisms release heat while they work, so temperature is a good indicator of the composting process. Temperature increases are noticeable within a few hours of forming a pile or a windrow (long, narrow pile), and they typically increase to 120 to 140° F and remain there for several weeks depending on the size of the system and composition of raw materials. Temperatures within the pile or windrow will gradually drop to 100° F as active composting slows and level out to ambient air temperature.

**Retention time.** The length of time required to convert raw materials to compost depends on the six factors described above. The shortest composting period results from proper moisture content and C:N ratio, plus frequent aeration. The process will be slowed if there is insufficient moisture, low temperatures, a high C:N ratio, large particles, a high percentage of woody materials that are resistant to decomposition, and inadequate aeration. Active composting takes two weeks to nine months, depending on the method and materials; curing generally requires another one to four months. The intended use of the compost ultimately determines the required composting period.

**Paving.** There is a long-held assumption in the state of Washington for composting facilities be paved. This is a very significant issue as the cost of the paving can be a large portion of the overall construction cost of the facility. For example, at the Kittitas County compost facility visited as part of this project, 3 acres of the 5 acre site is paved. This paving expense amounted to about 60% of the total construction cost of the project, (\$900,000), which was \$1.5M. On the contrary, the newly constructed

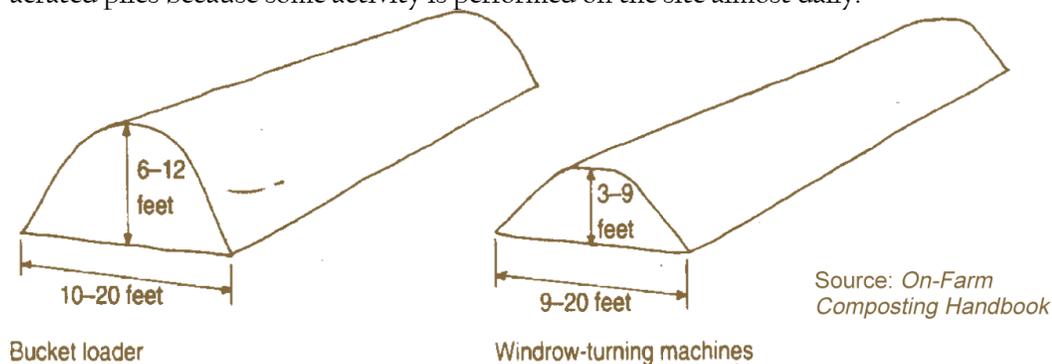
composting facility in Malaga, WA has no general site paving and they windrow compost off of a native compacted soil. The Kittitas County plant capacity is 6,000 tons of compost per year.

### 5.10.2 Types of Facilities

Composting facilities are aerated or unaerated and covered or not covered. Composting methods include passive piles, windrow composting, static piles, and in-vessel composting (in bins, beds, silos, transportable containers, and rotating drums). Passive piles are created by stacking materials in piles and allowing them to decompose over a long time with little management. This simple, inexpensive method also has some disadvantages: the pile can overheat and spontaneously combust; it can become anaerobic and release odors; it sits there for years, taking up valuable space; and it can look like a dump and attract the dumping of unwanted materials.

Passive piles can take a year or more to decompose, depending on the materials in the piles. Windrow composting involves placing mixed materials in long, narrow piles and turning or agitating them regularly. This is the most common method used for rapid composting of yard wastes.

Windrows are typically 3 to 12 feet high, 10 to 12 feet wide, and hundreds of feet long. Windrows are formed using a front-end loader, and they are turned with this equipment or a specialized turning device. This method is more labor-intensive than aerated piles because some activity is performed on the site almost daily.



**Typical windrow shapes and dimensions.**

Determining how often to turn windrows depends on the rate of decomposition, moisture content and porosity of the materials, and the desired composting time. High-nitrogen or easily degradable materials may require daily turnings at the beginning of the process and weekly turning later. The active composting stage will last three to nine weeks, depending on the type of materials and frequency of turning. To produce compost in three weeks, turn windrows once or twice each day for the first week and every three to five days thereafter.

A static pile is a passively aerated system that has no need for turning because air is supplied through perforated pipes embedded in the piles or windrows. The open ends of the pipes allow air to be drawn in and circulated through the piles or windrows through a chimney effect created by rising hot gases.

A variation on this approach is the aerated static pile system, which uses a blower to supply air to the compost pile. This system allows larger piles, and composts materials in three to five weeks. In-vessel composting refers to a diverse group of methods that confine the composting process within a container, building, or vessel and uses a combination of forced aeration and mechanical turning to speed up the composting.

Compared to windrow and aerated pile methods, these systems require less labor and land area and offer potentially better odor control, faster composting (in a matter of days as opposed to weeks), and consistently good compost. However, in-vessel systems have high capital, operating, and maintenance costs, ranging from \$40 to \$150 per wet ton of waste. Because of the high costs, these systems are not usually used to compost yard waste; they are used more often to compost sludge, mixed solid waste, and other hard-to-manage materials. Equipment requirements depend on the technology used. All that is needed for a static pile is a front-end loader and a screen to sift the compost; an aerated static pile also needs a perforated pipe and a blower. For windrow operation, equipment might include a front-end loader, chipper, tub grinder, screen (depending on end-use), windrow turner (for large sites), and a dump truck. Equipment needed for in-vessel systems depends on the process. In any operation, having properly sized equipment makes manpower more efficient. It is very important to set a maintenance schedule because equipment maintenance is the key to an operation's success. Tools needed to maintain equipment may include an air compressor, pressure washer, power and air tools, and a used oil collection and handling system. In summary, windrow and static pile systems are comparable in cost, labor, management, and speed of process. In-vessel composting is faster, but it has high capital costs with the exception of simple bin methods and some agitated bed systems.

### 5.10.3 Facility Siting and Development

The size of the site required for composting depends on the following factors: the anticipated volume of raw materials, the technology to be used (the higher the level, the less space required), the equipment to be used (which depends on the method and raw materials), and the projections for growth. Some factors that should be considered when choosing a site are: accessibility (roads suitable for traffic and convenient to feedstocks, or raw materials), population density (no houses within half a mile), and type of neighbors (some industries require a clean atmosphere and no flies). Desirable site characteristics include (1) slightly sloped land (for drainage), (2) a firm soil type that packs well, (3) not located in a flood plain, (4) convenient utilities, and (5) a rectangular or square site, which is more efficient than a circular or irregularly shaped site. Figure 1 shows a generic site layout for a composting facility. The following steps are recommended for site development:

- (1) Grade the site to a 2 to 4 percent slope
- (2) Slope the site toward a collection pond
- (3) Add minimal paving under the compost (especially for sludge and municipal solid waste)
- (4) Build berms around the perimeter to control run-off and run-on
- (5) Plan areas for raw materials storage, processing, composting, curing, storage, and blending of end product
- (6) Set up equipment in locations convenient to the process
- (7) Construct retainer walls for storage piles
- (8) Develop a screen around the site (fencing/plants/shrubs/trees)
- (9) Build a fence and gate to control access to the site
- (10) Install appropriate utilities depending on the method and process (2-inch minimum water main, storage and tool building, office and lab, maintenance shed)
- (11) Obtain proper permits (this is mandatory)

—local: zoning, building, land use  
 —state: water discharge, composting, transporting, air, health department

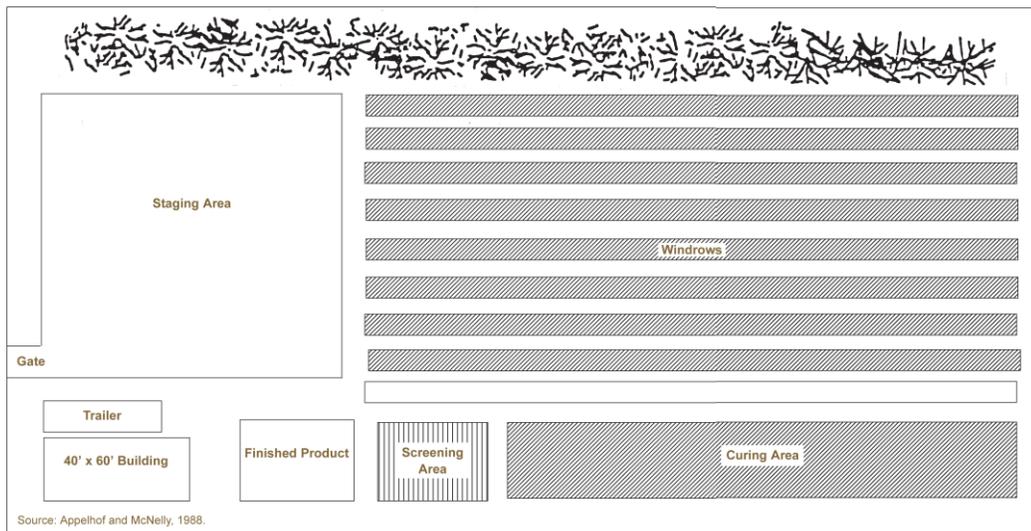


Figure 1. Generic compost site layout.

### 5.10.4 Feedstocks

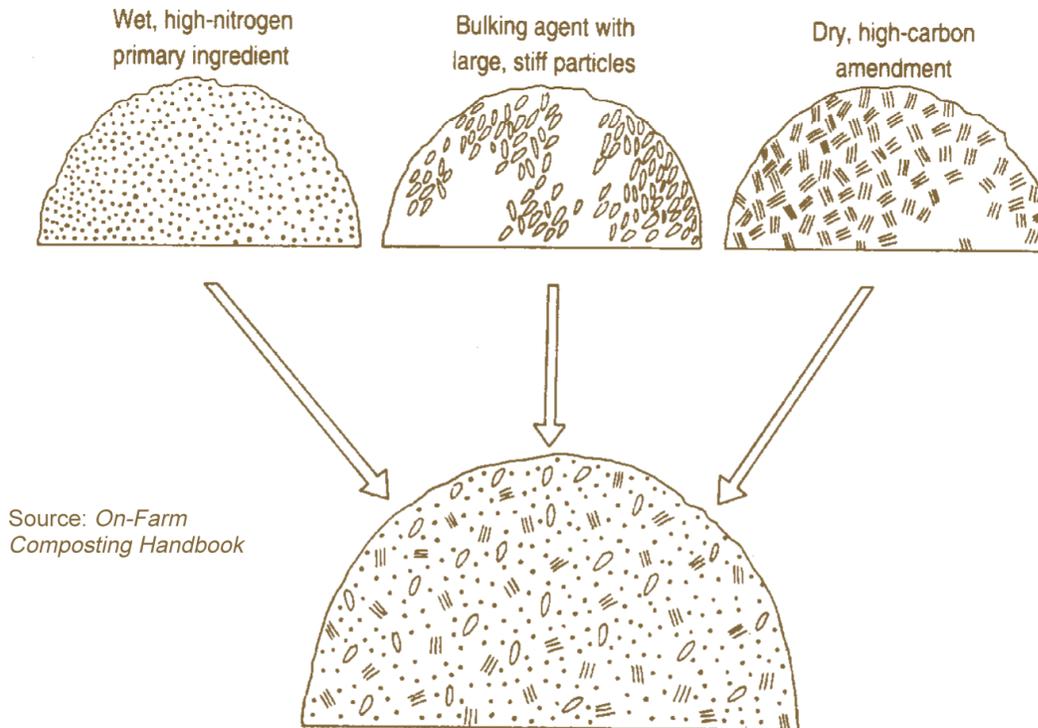
A wide variety of raw materials, or feedstocks, may be used for composting, including yard waste, food scraps, agricultural materials, industrial processing wastes, sludges. Most often there is a primary raw material to be composted and other materials are added. Rarely will an organic material have all of the characteristics needed for efficient composting, so other materials (amendments or bulking agents) must be blended to achieve the desired characteristics. Amendments can be added to adjust moisture content, C:N ratio, or texture. Bulking agents provide structure to hold up materials in a pile and maintain pore spaces for air movement. The desired characteristics of feedstock mixes are summarized in Table 1.

Some of the factors that should be considered when selecting feed-stocks include (1) material source and type, (2) collection frequency, (3) condition of materials collected, (4) condition of material as delivered (may differ from when it was picked up), (5) amount of each material type, and (6) daily delivery schedule. Other feedstock collection criteria include:

- regulatory constraints
- content of chemical, organic, and physical contaminants
- finished product use constraints
- compatibility with finished product markets
- compatibility with the composting technology
- impact on odor generation
- cost and availability

Another issue that must be kept in mind is the Organic Standards adopted on a Federal level. These standards classify biosolids as an unacceptable component of organic compost. This is significant because biosolids are the most appropriate and available nitrogen source. The organic market is an important target for most composting facilities. Therefore, the operator may need to segregate piles and make two types of compost, one with biosolids and the organic fraction of the market would be served with a product to which no biosolids have been added.

Raw material recipes are determined primarily by the moisture content and C:N ratio. But degradability, odor potential, and cleanness (degree of contamination from unwanted materials, chemicals, and organisms) also should be considered. Developing a recipe is a balancing act between getting the moisture content and C:N ratio within acceptable ranges. If the moisture content is too high, it can lead to anaerobic conditions, odors, and slow decomposition. If the C:N ratio is below 25:1, odor problems may develop; if the ratio is above 40:1, composting takes a lot longer. Analyzing raw materials for their physical and chemical characteristics helps in developing composting recipes. Important characteristics include moisture content, density, nutrient ratio, and pH.



***Combining raw materials to achieve the desired characteristics for composting.***

To establish near-optimum composting conditions, it is important to create composting recipes based on calculations. Using a formula requires a knowledge of the moisture content and the percentage of the dry weight of carbon and nitrogen for each material. Formulas may be found in publications such as the *On-Farm Composting Handbook* and the *Compost Facility Operating Guide*, or on Cornell University's web site: <http://www.cfe.cornell.edu/compost/calc/simultaneous.html>.

If the goal is simply to compost leaves, then calculations are not necessary. Leaves will compost slowly on their own; however, adding nitrogen (through grass clippings, manure, or nitrogen fertilizer) will accelerate decomposition. A rule of thumb is to add one part grass clippings to three parts leaves, or two pounds of nitrogen fertilizer to a cubic yard of leaves.

### 5.10.5 Testing

Testing involves collecting and analyzing representative samples of compost for meeting process optimization, safety, compliance, and market standards. Three types of tests may be conducted: field tests, on-site laboratory tests, and off-site lab tests. Common field tests measure temperature, oxygen concentration, odor, color, and noise. On-site lab tests may examine pH, moisture content, bulk density, soluble salts (conductivity), respiration, particle size, seed germination, and man-made inerts. Equipment needed for an on-site testing lab may include a refrigerator, drying oven (a microwave oven is suitable), balance, pH meter, oxygen-measuring device, temperature-measuring device, nest of sieves, and record-keeping material. Off-site lab tests may measure metals content, organic content, pathogens, particle size, respiration, man-made inerts, pH, and odor.

How often compost is tested depends on the amount of information needed, the extent of information already available about feedstocks, and the composting process. More frequent testing is necessary during start-up operations and when new feedstocks are used.

### 5.10.6 Odor Management

Some odor will occur with any composting operation, so odor-control procedures should be included in the planning, design, and operation of compost facilities. The odors originate from three main sources: odorous raw materials, ammonia released from high-nitrogen materials, and anaerobic conditions within windrows and piles. But strong-smelling raw materials cause most of the odors. Sewage sludge, liquid manure, and fish wastes typically present odor problems; leaves, sawdust, crop residues, and fresh-bedded manure do not. The odors can be minimized by starting the materials composting as soon as possible and by keeping them aerobic.

One of the key issues in the management of odors generated in the composting process is the issue of composting site location. The prevailing winds must be taken into account. Proximity to residential housing of any kind is critical particularly if the receptors are down-wind of the processing facility. Site-specific odor dispersion modeling may be appropriate

The following recommendations will help minimize odors:

- (1) Develop a good feedstock recipe and keep the feedstock well mixed
- (2) Store raw materials for the least amount of time possible
- (3) Keep pile height at about 4 1/2 feet
- (4) Maintain pile moisture around 55 percent
- (5) Turn pile twice a week
- (6) Prevent puddles and standing water (pools of anaerobic activity)
- (7) Minimize dust (it carries odors)
- (8) Keep storage piles contained and dry
- (9) Keep facility tidy (bits of compost lying around can become anaerobic)

### 5.10.7 Compost Quality and End-Use

Although no standards currently exist for compost quality, many parameters have been conventionally used, including the following:

- pH (5.5 - 7.5)
- organic matter content
- soluble salts (<5 mmhos/cm)
- moisture content (35 - 55 percent)
- nutrient content
- particle size (3/8 inch - 1 inch)
- water-holding capacity
- bulk density (<1000 lbs./cu yd.)
- stability

The compost quality guidelines for each of these parameters vary according to end-user specifications. For example, compost to be used as atop dressing for plants is recommended to be less than 1/4 inch in diameter; whereas compost that is less than 1/2 inch in diameter is acceptable for other uses, such as a soil amendment or potting media.

Aesthetic parameters, such as color and texture, are also important because people choose compost products primarily by appearance. For example, a dark compost is assumed to be better than a lighter-colored one. Compost may be used as a soil incorporant, mulch, turf or other plant topdressing, an amendment to growing mixes, and a blend with topsoil. Currently, the number one use of compost is in planting beds. It is predicted that compost will be used widely for field nursery production. Some of the benefits of mature compost to soil and plants include its ability to:

- improve soil structure
- reduce fertilizer requirements
- improve water infiltration and drought tolerance
- reduce soil compaction and crusting
- improve root growth and yields
- increase microbial and earthworm populations in soil
- protect plants from disease
- slowly release nutrients to plants
- improve nutrient-holding capacity
- increase ease of cultivation

Compost has also proven to be useful in pollution prevention and remediation. It is being used to prevent erosion of hillsides, embankments, and roadsides. Compost can also bind heavy metals in contaminated soils, degrade many pesticides, and absorb odors and degrade volatile organic compounds. In addition, compost is being used in wetland damage mitigation, storm water filtration, and biofilters.

### 5.10.8 Marketing

A key to the success of a composting operation is a marketing or distribution program for compost products. To develop long-term markets, the products must be of consistently high quality. Other essential marketing factors include planning,

knowledge about end-users, following basic marketing principles, and overcoming possible regulatory barriers and product stigma. Compost characteristics desired by end-users vary with intended uses, but most compost users look for the following elements (in order of importance):

- (1) Quality (moisture; odor; feel; particle size; stability; nutrient concentration; product consistency; and a lack of weed seeds, phytotoxic compounds, and other contaminants)
- (2) Price (should be competitive with other composts, although high quality and performance can justify a higher price)
- (3) Appearance (uniform texture, relatively dry, earthy color)
- (4) Information (product's benefits, nutrient and pH analysis, and application rates and procedures)
- (5) Reliable supply

How compost is sold depends on the amount, quality, appearance, and seasonal availability. Most compost is used in spring and early summer. Consider whether to sell compost in bulk, in bags, or both. Bagging expands the potential market because bags can be sold at retail outlets. Bagged compost may be sold at a higher price, which justifies higher transportation costs, and thus, can support a larger market area. The bulk market usually stays at the local level due to high transportation costs. The best markets for bulk sales are local nurseries, landscapers, and home gardeners. The following are potential end-users for compost:

- Growers (greenhouse, container, sod, field, agriculture, silviculture)
- Landscapers/turf managers (commercial properties, sports turf, residential lawns, cemeteries)
- Government agencies (parks, schools/universities, roadsides/high-ways, sports turf)
- Companies or agencies involved in environmental projects (wetlands, biofilters, erosion control, soil remediation, water filters)
- Farmers (fruit, vegetable, field crops, organic)
- Owners of golf courses and cemeteries
- Homebuilders and buyers (new home builders, renovators, organic gardeners, homeowners)

## 5.11 Review of Alternatives

This plan examined four overall project approaches: Compost and Vermiculture Process Facility; Compost Only Facility, Hauling Greenwaste Offsite With County-Owned Trailer, and Contracted Hauling of Greenwaste Offsite. As part of the evaluation, cost of equipment, ancillary equipment, engineering, and a 20-year needs and opportunities cost has been included. The evaluation of the four alternatives is outlined in the subsequent sections.

### 5.11.1 Option 1: Compost and Vermiculture Process Facility

The “Compost and Vermiculture Process Facility” alternative requires the purchase of a loader for material/greenwaste handling, a tromel screen, horizontal grinder, vermiculture equipment, and worms. Additional necessities contributing to overall project costs include site paving, a new vermiculture building, installation of process equipment, additional site development work, design engineering, and construction management. The cost associated with these items is summarized below.

### Option 1: Compost and Vermiculture Process Facility Cost Summary

Item	Unit Cost	Subtotal
Loader	\$40,000.00	<b>\$416,000.00</b>
Tromel Screen	\$75,000.00	
Horizontal Grinder	\$150,000.00	
Compost Equipment	\$125,000.00	
Vermiculture Equipment	\$21,000.00	
Worms	\$5,000.00	
Site Paving	\$60,000.00	<b>\$143,000.00</b>
New Vermiculture Building	\$78,000.00	
Installation of Process Equipment	\$35,000.00	
Worm Culture	\$5,000.00	
Site Development Work	\$25,000.00	
Contingency (20%)	\$111,800.00	<b>\$111,800.00</b>
Engineering and Construction Management	\$167,700.00	<b>\$167,700.00</b>
<b>Total Cost of Option 1: \$838,500.00</b>		

In evaluating the 20-year needs and opportunities costs including an assumed annual feed rate of 3,000 tons per year at a tipping fee rate of \$37.00 per ton and against the associated operating costs, the 20-year worth is \$2,669,249.00.

### 5.11.2 Option 2: Compost Only Facility

The “Compost Only Facility” alternative requires the purchase of a loader for material/greenwaste handling, a tromel screen and horizontal grinder. The vermiculture equipment and worms are not included in this option, so there is an associated cost savings with the other project costs including site paving, installation of process equipment, site development work, design engineering, and construction management. The cost associated with these items is summarized below.

### Option 2: Compost Only Facility Cost Summary

Item	Unit Cost	Subtotal
Loader	\$50,000.00	<b>\$400,000.00</b>
Tromel Screen	\$75,000.00	
Horizontal Grinder	\$150,000.00	
Compost Equipment	\$125,000.00	
Site Paving	\$50,000.00	<b>\$100,000.00</b>
Installation of Process Equipment	\$25,000.00	

Site Development Work	\$25,000.00	
Contingency (20%)	\$100,000.00	<b>\$100,000.00</b>
Engineering and Construction Management	\$150,000.00	<b>\$150,000.00</b>
<b>Total Cost of Option 2: \$750,000.00</b>		

In evaluating the 20-year needs and opportunities costs including the same assumed annual feed rate of 3,000 tons per year at a tipping fee rate of \$37.00 per ton and against the associated operating costs, the 20-year worth is \$343,237.00.

### 5.11.3 Option 3: Hauling Greenwaste Offsite With County-Owned Trailer

The “Hauling Greenwaste Offsite with County-Owned Trailer” alternative still requires the purchase of a loader for material/greenwaste handling, a horizontal grinder, and a live floor trail for hauling the greenwaste to Wenatchee. The additional project costs include site paving, installation of process equipment, site development work, design engineering, and construction management. The cost associated with these items is summarized below.

#### Option 3: Hauling Greenwaste Offsite with County-Owned Trailer Cost Summary

Item	Unit Cost	Subtotal
Loader	\$40,000.00	<b>\$370,000.00</b>
Horizontal Grinder	\$150,000.00	
Live Floor Trailer	\$80,000.00	
Site Paving	\$20,000.00	<b>\$70,000.00</b>
Installation of Process Equipment	\$25,000.00	
Site Development Work	\$25,000.00	
Contingency (20%)	\$88,000.00	<b>\$88,000.00</b>
Engineering and Construction Management	\$132,000.00	<b>\$132,000.00</b>
<b>Total Cost of Option 3: \$660,000.00</b>		

In evaluating the 20-year needs and opportunities costs including the same assumed annual feed rate of 3,000 tons per year at a tipping fee rate of \$37.00 per ton and against the associated operating costs, the 20-year worth is \$ 497,000.00.

### 5.11.4 Option 4: Contract Hauling of Greenwaste Offsite

The “Contract Hauling Greenwaste Offsite” alternative requires the purchase of a loader for material/greenwaste handling, and a horizontal grinder. This option entails hiring a contractor to haul greenwaste material from the landfill to Wenatchee. The additional project costs include site paving, installation of process equipment, site development work, design engineering, and construction management. The cost associated with these items is summarized below.

**Option 4: Contract Hauling of Greenwaste Offsite Cost Summary**

<b>Item</b>	<b>Unit Cost</b>	<b>Subtotal</b>
Loader	\$40,000.00	<b>\$190,000.00</b>
Horizontal Grinder	\$150,000.00	
Site Paving	\$20,000.00	<b>\$60,000.00</b>
Installation of Process Equipment	\$25,000.00	
Site Development Work	\$15,000.00	
Contingency (20%)	\$50,000.00	<b>\$50,000.00</b>
Engineering and Construction Management	\$75,000.00	<b>\$75,000.00</b>
<b>Total Cost of Option 4: \$375,000.00</b>		

In evaluating the 20-year needs and opportunities costs including the same assumed annual feed rate of 3,000 tons per year at a tipping fee rate of \$37.00 per ton and against the associated operating costs, the 20-year worth is \$1,845,000.00.

## 5.12 Recommendations

The county Solid Waste Advisory Committee (SWAC) reviewed Organic waste and Composting on September 2010. No solid waste composting facilities or programs are recommended at this time. Future proposals or opportunities should be evaluated on a case by case basis.

**Chapter  
6****Waste Processing  
Technologies****6.1 Existing Conditions**

Waste processing and/or incineration are both methods to reduce the volume of landfilled wastes and recover recyclable or energy products from the waste stream. There are currently no waste processing or incineration facilities for municipal solid waste (MSW) in Okanogan County.

Five main technologies have emerged for processing municipal solid waste:

- Incineration with or without energy recovery
- Mechanical MSW processing (“dirty-MRF”)
- Mixed MSW composting
- Pyrolysis
- Vitrification

Each of these technologies is described in the following sections:

**Incineration**

Field-erected incinerators are typically large structures designed to handle over 300–400 tons per day. Most major structures designed during an engineering phase are built on-site. Many field-erected incinerators include energy recovery and are capable of accommodating advanced pollution control equipment, including mercury recovery. The Spokane incineration facility is an example of a field-erected facility. Okanogan County’s waste quantities (approximately 50 tons per day, including non-incinerable wastes) are far below the threshold required for field-erected incinerators.

Modular incinerators are shop-fabricated and are designed for peak efficiency under controlled combustion conditions. The incineration chambers are typically lined with refractory materials. Modular incinerators can be classified into those that operate in an excess air mode during the entire combustion process, and those that operate under a dual combustion process that takes place first under starved air conditions and then under excess air conditions. Energy recovery with modular units is usually uneconomic but can be included to increase public acceptability. Modular incinerators are produced in a variety of sizes ranging up to 50 tons per day or more.

In both types of incinerators, MSW can generally be burned without the need for pre-processing. Exceptions include those types of incinerators (such as fluidized bed) where shredding is essential for proper combustion of the waste. However, pre-processing is beneficial in most cases, since waste lacking calorific value or capable of

damaging refractory materials can be diverted from the incinerators, reducing maintenance costs and ash production.

Historically, precipitators have been the most-used form of air pollution control technology. More recently, the trend has shifted towards the use of wet/dry scrubbing with baghouses. The scrubbing process, which has become a requirement for the removal of acid gas constituents from the airstream, appears to be gaining greater use with baghouses than with electrostatic precipitators. Mercury recovery has been an increasing concern, although smaller modular incinerators are often allowed to operate without control equipment.

Ash comprises approximately 30% by weight and 10% by volume of the burned MSW stream. Prior to the early 90s, incinerator ash was commonly landfilled in inert landfills. Gradually, ash disposal shifted to incinerator ash monofills located at regional landfills. This has been the case with the Spokane facility.

The most readily marketable form of energy derived through the incineration of solid wastes is electrical power. Although steam and district heating/cooling can be a more thermally efficient use of heat, both require the end user to be located in close proximity to the disposal plant. On the other hand, electricity may be distributed through existing networks and therefore is less location-dependent. A 100 ton per day facility can produce on the order of 1-1.5 megawatts of generating capacity, some of which is used to operate the facility. The remainder can be sold, with facility contracts averaging \$0.03 per kilowatt/hour.

During the 90s a number of incineration/energy recovery facilities were abandoned due to high costs and the availability of much lower cost regional landfills. The Skagit County facility, funded in part by Ecology grants, was finally mothballed and then scrapped in 2001. The Recomp facility in Bellingham, with two 50 ton per day modular incinerators, shifted to medical waste incineration in order to increase profitability in the mid-90s and then was mothballed in 1999. The Olivine facility, also in Bellingham, was mothballed during this period as well. The Tacoma refuse-derived fuel facility was operated sporadically during the 90s and is currently operating at a fraction of its capacity. The only remaining local government-owned incineration facility in operation is the Spokane facility.

### Mechanical MSW Processing

Waste processing facilities use a combination of mechanical and manual means to separate mixed MSW into a stream of recyclable materials, refuse-derived fuel (RDF), and a heavy residual fraction that is landfilled. Potentially recoverable recyclables include metals and cardboard, although some facilities have also attempted to recover paper and plastic containers. The primary objective of waste processing facilities is usually RDF or MSW composting feedstock (discussed in the next section).

RDF facilities process MSW into burnable and non-burnable fractions, and then compact or size the burnable fraction into a form that can be used by industrial incinerators. Some RDF plants are used to produce both fuel and a MSW composting feedstock, although this is very rare in North America. RDF facilities typically feature an initial sort station to remove oversize and hazardous materials; a trommel to size material; magnetic and eddy-current separators to remove metals; ballistic classifiers or

screens to separate remaining heavy materials (e.g. glass and ceramics); and finally a shredding and pelletizing step to form the fuel product. The relatively homogeneous fuel product is then burned on-site for energy recovery or marketed to industrial burners. The combustion of RDF produces more energy and less ash, since the processing removes foodwaste, fines, glass, and metals, and leaves primarily paper, woodwaste, and plastic for burning.

Both the Recomp (Bellingham) and Tacoma RDF facilities have included some components of waste processing. In both cases, problems were encountered with the cost-effectiveness of the operation as well as difficulty marketing products. Recyclables are often wet and/or contaminated with other mixed wastes. Many mills reject non-source-separated recyclables, further limiting the market for recyclables recovered from mixed waste. The marketability of RDF depends on the existence of compatible industrial boilers, with owners willing to accept RDF. Many operators do not accept RDF due to emissions control concerns and unwillingness to impact their existing pollution control permits. The heavy fraction, although largely inert, still contains pathogens and other substances which limit its disposal to permitted MSW landfills.

Mechanical waste processing with or without RDF production has not been successful in Washington State, again due to competition from relatively lower cost regional landfills. The Recomp processing line was dismantled for salvage, and the Tacoma municipal RDF facility continues to be unable to operate at capacity on municipal solid waste. Mechanical waste processing will remain unfeasible unless: recycling markets become more forgiving toward non-source-separated recyclables; local RDF markets with proper pollution controls become available; and disposal costs rise significantly above \$100 per ton.

### Mixed Municipal Solid Waste Composting

Mixed MSW composting facilities process the MSW stream through a processing facility, then compost the shredded fluff and heavy fraction. The processed stream is typically loaded into a “digester” or mixing drum, then placed in aerated channels or windrows for a 21-30 day active composting process. Composted materials are then screened and placed in active or static curing piles for up to six months. Products are screened again and then sold or given away as compost for mine reclamation, roadside soil amendments, or other industrial uses. MSW compost does not typically meet standards for unrestricted use and is thus not used for residential or commercial landscaping.

Three mixed MSW solid waste composting facilities have been attempted in the Pacific Northwest: the Riedel facility in Portland, the Recomp<sup>6</sup> facility in Bellingham, and a very small facility in Gold River, B.C. All facilities eventually failed due to technical, odor, economic, and/or flow control issues. No new MSW composting facilities have been developed in the Pacific Northwest in the past few years.

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<sup>6</sup> The Recomp facility in Whatcom County was intended to be a fully integrated facility, including waste processing, MSW composting, incineration, and waste export. The facility proved uneconomic and due to flow-control issues, was eventually converted to a waste export-only facility.

## Pyrolysis

Pyrolysis is not an incineration technology per se, but rather can be used as a front end process for an incinerator. In a pyrolysis facility, waste is loaded by batches into a chamber. The chamber is maintained in an air-starved environment and heated. As the temperature is increased, materials degrade and various gasses and fluids are released by the waste. These output streams are recovered for their energy content and then burned. A number of Japanese incinerators have included pyrolysis components in their front end, with the incinerator combustion chamber used simply to burn pyrolysis byproducts. In North America, the emphasis on pyrolysis has generally been more focused on gas, carbon, and oil recovery from tires rather than as a means to process MSW, although a joint venture between Texaco and the Lawrence Livermore National Laboratory in the U.S. has investigated MSW pyrolysis. In Europe, the emphasis on pyrolysis is directed more toward biomass (wood and crop waste) conversion, low grade coal, and tires. At this stage, MSW pyrolysis should be considered more of an experimental technology rather than a mature industry with a proven track record.

No commercial-scale MSW pyrolysis facilities currently existing in North America.

## Vitrification

Vitrification is a generic description of a group of technologies which convert one or more wastes into glass-like products. Most of the initial development work on vitrification has been performed for the U.S. Department of Energy and military as a potential stabilization technique for nuclear waste. Converting nuclear wastes into a glass form offers the advantage of suspending wastes in an essentially non-leachable state, as well as providing varying degrees of volume reduction. This is particularly important for high level nuclear wastes, which can have disposal fees of \$600,000 or more per ton.

Different vitrification technologies are used for handling different materials. A common approach is to use a ceramic-lined covered pot. A material feed system, electrodes, oxidation air lines, and exhaust gas vents are built into the cover. A glass tapping port is built into the side of the chamber. The process is started by preheating seed material in the pot to form a molten pool. Waste materials are then gradually fed into the molten pool. The pool is tapped to recover vitrified materials. An alternative approach that is perhaps more appropriate for MSW is the cyclone melter. This approach introduces finely ground input materials (e.g. incinerator ash) into a cyclonic furnace which produces a vitrified gravel. The attached report<sup>7</sup> provides details on these and other technical vitrification approaches.

Vitrification has been used to process a variety of wastes including high level and low level nuclear wastes, contaminated soil, uranium mining tailings, medical waste, incinerator ash, certain hazardous materials (e.g. steel mill flue dust), and MSW incineration ash. A number of developers are attempting to commercialize this technology to handle a variety of waste streams.

The most likely scenario for MSW vitrification appears to be a multistep process combining a number of processing technologies. Incoming waste would require initial

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<sup>7</sup> Chapman, Chris. *State of the Art Glass Melters*, Pacific Northwest Laboratory, date unknown.

sorting to remove oversize materials, large scrap metals, and other undesirable materials. The sorted material would then be either incinerated in a traditional mass burn MSW incinerator or fed through a gasification/pyrolysis system. The incineration or pyrolysis process is desirable for size reduction and preparing a better feedstock for vitrification. The incinerator ash or carbonaceous pyrolysis char would then be screened and fed into a cyclonic vitrifier for conversion into glass.

No commercial-scale MSW vitrification facilities exist in North America.

## 6.2 Needs and Opportunities

None of these waste processing alternatives are considered feasible in Okanogan County. The County's relatively small waste stream (50 tons per day of total waste, of which the percentage of processible waste is unknown) precludes most technologies. The County's relatively low tipping fee for landfill disposal and long term capacity eliminates incentives for considering more expensive alternative technologies.

Thus, there is no immediate need to conduct a technical feasibility analysis of any of the potential processing options.

## 6.3 Alternatives

The applicability of each of the waste processing alternatives is as follows:

### Incineration

The County's waste stream is far too small to consider a field-erected incinerator. A 30-40 ton per day modular incinerator might be technically feasible, although economic and emission concerns would need to be overcome. Landfill capacity would still be required both for ash and for non-incinerable wastes such as oversized materials (couches, mattresses), non-burnables, asbestos, large dead animals, and other problem wastes. The combined cost of incineration, pollution control, local landfilling of problem wastes, and the local landfilling or export of ash would likely be prohibitive.

### Mechanical Waste Processing

The size of the County's waste stream does not allow the economies of scale necessary for efficient processing. Alternatively, the County could rely on community service labor, although concerns about human contact with waste might require more in-depth evaluation of the applicability of a labor-intensive approach. No known RDF markets exist in the north central portion of Washington, although no specific research has been conducted. Both the costs and marketability of recovered materials would make waste processing speculative at best.

### MSW Composting

The size of the County's waste stream again limits the efficient processing of feedstocks, since waste processing would need to occur prior to successful composting. Okanogan County may have mine reclamation markets for MSW compost, although no specific research has been conducted during Plan development. The recent track record of MSW

composting has not been encouraging and presents a significant degree of technical and economic risk should this option be considered in the future.

### Pyrolysis and Vitrification

Both of these technologies are speculative and adapted from handling other feedstocks with much higher tipping fees or levels of energy content. Neither technology is deemed to be currently viable on a commercial scale.

The adoption of any of these technologies would be capital intensive and would probably increase tipping fees above current levels. In turn, that could cause MSW to flow out of the county as self-haulers shift to less expensive disposal options. The County could attempt to exercise a number of flow control strategies, but all are risky and would not reduce the County's financial exposure of paying stranded capital costs if the facility failed. Thus, capital-intensive waste processing strategies are unlikely to be a wise choice for the County as long as a relatively low cost, in- or out-of-county landfill capacity is available.

## 6.4 Green Waste Processing Technologies

Aerobic digestion, vermiculture and anaerobic digestion are the realistic candidates for removing "Green Waste" (clean biomass) from the solid waste stream to the Okanogan Central Landfill. Removing green waste from the solid waste stream is important in achieving the diversion goals established by Washington Department of Ecology. The green waste is removed from the solid waste stream by diverting suitable materials, such as yard wastes and paper products, to an alternative fate known as beneficial use. Beneficial Use decreases the volume sent to the landfill and provides various other advantages as discussed elsewhere in this plan.

Aerobic digestion is achieved through the composting process described in Chapter 5 of this plan. Vermicomposting and its variants are recommended for implementation in the near term. For this reason vermiculture is discussed in more detail below.

In the future it is anticipated that anaerobic digestion will play a major process technology for managing green waste. We have included a discussion of anaerobic digestion options because we see the possibility that the Central Landfill could become a regionally significant waste processing facility in the midrange future.

Okanogan County has many unique attributes not available in other locales. These attributes (opportunities) may lead to a larger role for the county in the solid waste affairs of Washington State through beneficially using waste products sourced outside of the county. Diversion of greenwaste from the incoming solid waste stream can achieve the following:

- Extend the life of the existing landfill
- Beneficially use waste materials
- Limit discharge of ammonia and methane to the environment
- Benefit local farmers and gardeners.
- Create jobs (potentially)

Unlike vermiculture and aerobic composting, anaerobic processes tend to be feasible only on the large-scale. It has the advantage however of generating useable electrical

energy. We anticipate that these larger and more expensive anaerobic technologies can be adapted to the Okanogan County environment in the future as opportunities arise.

The exception to the statement that anaerobic technologies are more expensive than conventional aerobic processes is the static landfill bioreactor. This process involves the construction of multiple but reusable landfill cells. Clean, source selected feedstock including yard waste, paper, cardboard, manure, wood waste, food wastes and any other clean organic materials. Some industrial wastes, such as spent lime and forest slash are suitable for the landfill bioreactor process. The landfill bioreactor may be of interest as it involves construction of reusable landfill cells, a business in which the County is already engaged. The landfill bioreactor can be scaled up to treat large quantities of organic materials. This could be a significant advantage in the mid-to long-range future where management of waste material may become a more valued asset.

## **6.5 Vermiculture and Vermicomposting:**

Vermiculture (Worm Farming) is a promising option for management of food wastes and soiled paper. Since this technology is recommended for implementation in the near-term it is discussed in detail here. Over the past several years, many people have begun raising earthworms as a means of managing organic waste.

Although few outlets for sales of worms currently exist, there is significant competition for markets. The current major commercial use of earthworms is as bait for freshwater sport fishing. Research and development on uses for worms are under way throughout the world, but the opening of new markets for worms and castings will be slow and somewhat uncertain. Those interested in getting into the earthworm business should explore potential local markets carefully.

Vermicomposting is the process of turning organic debris into worm casting. The focus is on processing the waste rather than creating ideal conditions for raising earthworms. Earthworm size and their reproductive rates are frequently lower than those of the same species raised in vermiculture systems. Large Vermicomposting facilities typically make money primarily from tipping fees, followed by sales of castings, and then, in a distant third place, by sales of earthworms.

Vermiculture is the raising of earthworms for resale, so the focus is on ideal conditions for worm growth, reproduction, and health. Worm farmers usually purchase and haul feedstock or pay for feedstock to be delivered to them. Others may get the material for free but pay for it to be pre-composted and hauled to their site. Worm growers make money from sales of earthworms and sometimes, but not always, by selling castings. Additional information on the potential to market the earthworms and worm castings is provided in the next section.

### **6.5.1 Potential Markets for Earthworms and Vermicompost**

Several options are available for the sale of earthworms. Home composters and gardeners are interested in buying earthworms (free of soil). Fish hatcheries, tropical fish stores, pet stores, zoos (with exotic fish and birds), game bird breeders, frog farmers, and poultry growers buy worms as feed for animals. Community educators, such as Extension agents or recycling coordinators, often need a steady supply of earthworms for setting up new worm bins. Private laboratories, universities, and high schools use worms for research and classroom needs.

It may be possible to sell earthworms to locally owned sporting goods or fishing tackle stores, although most of the larger stores of this type rely on established wholesalers for their bait supplies. The bait market may not be the best choice for this enterprise because there is usually more interest in nightcrawlers (larger worms) than smaller compost worms, the market is often saturated, and the competition is stiff.

Other markets for earthworms include:

- Large-scale vermicomposting facilities.
- Worm growers just entering the business.
- Institutions and businesses that do on-site vermicomposting of their food scraps and other organic materials (including prisons, hospitals, schools, colleges and universities, restaurants, grocery stores, and office buildings).
- Farmers desiring to vermicompost animal manure (including livestock and poultry farms, rabbitries, and horse stables).
- Worm growers with orders too large to fill from their own stocks.
- Industries with organic wastes suitable as feedstock for worms, such as papermills, breweries, cardboard manufacturers, land reclamation sites, generators of sludge/biosolids, food processors, canneries, wineries, and cotton mills.

Many worm growers focus on selling vermicompost rather than earthworms. Vermicompost is a blend of castings and decomposed organic matter that has been placed in a worm bin. The nutrient content of vermicompost depends on the types of feedstocks and bedding provided for the worms. Studies have shown that vermicompost enhances plant growth, suppresses disease in plants, and increases microbial activity in soil. Vermicompost also improves water retention, aeration, and porosity in soils.

Due to its high cost, compared to commercial fertilizers, vermicompost is not commonly used as a soil amendment or plant growth enhancer by large commercial plant growers. Nonetheless, vermicompost is increasingly being used by organic gardeners and is sold commercially in some nurseries as a soil amendment or planting medium for ornamental plants. A growing body of research demonstrating the beneficial uses of vermicompost is helping to increase market outlets. Vermicompost may be sold in bulk by the cubic yard or bagged with a variety of compost and soil blends. Markets include home improvement centers, nurseries, landscape contractors, greenhouses, garden supply stores, grocery chains, flower shops, discount houses, and the general public.

## 6.5.2 Earthworm Classification

Earthworms are terrestrial invertebrates with thousands of species grouped into three categories according to their behavior in the natural environment: anecic, endogeic, and epigeic.

Anecic species, represented by the common nightcrawler (*Lumbricus terrestris*), construct permanent vertical burrows as deep as 4 to 6 feet in the soil. They feed on organic debris on the soil surface and convert it into humus. If anecic species are deprived of their permanent homes, they will discontinue breeding and cease to grow.

Endogeic species, such as *Aporrectodea caliginosa*, build wide-ranging, mainly horizontal burrows where they remain most of the time, feeding on mineral soil particles and decaying organic matter. They are the only species of earthworms that actually feed on large quantities of soil. As they move through the soil and feed, they mix and aerate the soil and incorporate minerals into the topsoil.

Epigeic species, represented by the common redworm (*Eisenia fetida*), do not build permanent burrows; instead, they are usually found in areas rich in organic matter, such as the upper topsoil layer, in the forest under piles of leaves or decaying logs, or in piles of manure. Since they don't burrow deeply into the soil and prefer to eat rich organic matter, epigeic worms adapt easily to vermiculture and vermicomposting systems.

*Eisenia fetida* and *Eisenia andrei* constitute about 80 to 90 percent of the earthworms raised on a large-scale commercial basis.

### 6.5.3 Biology of Earthworms

The physical structure of earthworms is similar among the different species. Earthworms belong to the phylum Annelida, which means "ringed." The "rings" around worms are called segments. Redworms have about 95 segments, while nightcrawlers have about 150. Earthworm bodies are streamlined, containing no protruding appendages or sense organs, to enable them to pass easily through soil. Worms have well-developed nervous, circulatory, digestive, excretory, muscular, and reproductive systems.

The head or anterior end of the earthworm has a prostomium, a lobe covering the mouth that can force open cracks in the soil into which the earthworm can crawl. Setae (bristles) on each segment can be extended or retracted to help earthworms move. Lubricating mucous, secreted by skin glands, helps worms move through soil and stabilizes burrows and castings.

The earthworm's digestive tract extends the whole length of its body. Worms swallow soil (including decomposing organic residues in the soil) or residues and plant litter on the soil surface. Swallowed matter is mixed by strong muscles and moved through the digestive tract while enzyme-filled fluids are secreted and blended with the materials. The digestive fluids release amino acids, sugars, bacteria, fungi, protozoa, nematodes, and other microorganisms, in addition to partially decomposed plant and animal materials from the food the worms have swallowed. Simpler molecules are then absorbed through intestinal membranes and are utilized by earthworms for energy and cell production.

Earthworms do not have specialized breathing devices. They breathe through their skin, which needs to remain moist to facilitate respiration. Like their aquatic ancestors, earthworms can live for months completely submerged in water, and they will die if they dry out.

A red pigment in earthworms' skin makes it sensitive to ultraviolet rays. Brief exposure to strong sunlight causes paralysis in some worms, and longer exposure kills them. Earthworms seen lying dead in puddles after a rainstorm likely were killed by exposure to light, not by drowning, since they can live submerged in water. However, worms will

emerge from their burrows seeking oxygen when unoxygenated rainwater filters down through the soil and squeezes most of the rest of the oxygen from the soil spaces. Taste cells are located in and near an earthworm's mouth, and worms show definite food preferences. Experiments have demonstrated that they will pass up cabbage if celery is available and shun celery if carrot leaves are offered.

Earthworms are hermaphroditic, meaning each individual possesses both male and female reproductive organs. The eggs and sperm of each earthworm are located separately to prevent self-fertilization. When worms mate, they face in opposite directions and exchange sperm; the eggs are fertilized at a later time. Mature eggs and sperm are deposited in a cocoon produced by the clitellum, a swollen, saddle-shaped structure near the worm's head. Within the cocoon, the sperm cells fertilize the eggs, and then the cocoon slips off the worm into the soil. The number of worms inside each cocoon and the length of time it takes them to hatch varies according to worm species and environmental conditions. Approximately four *Eisenia fetida* baby worms will emerge from a cocoon in 30 to 75 days, and another 53 to 76 days must pass for the newly hatched worms to reach sexual maturity.

Earthworm cocoons resemble grape seeds in size and shape, with one end rounded and the other slightly pointed. Cocoons are initially pearly-yellow in color, then deepen to brown as the young inside mature and get ready to hatch.

Earthworms can only reproduce using sperm from members of their own species. Claims of hybrid worms are not valid.

## 6.5.4 Earthworm Production

Earthworms have certain minimum care requirements that must be met on a regular schedule. The key environmental factors affecting earthworm growth, reproduction, and health are temperature, moisture, aeration, pH (acidity-alkalinity), and food material.

### Temperature

Earthworms live and breed at temperatures between 55 and 85 degrees Fahrenheit. For commercial earthworm production, the ideal temperatures for growth and activity range from 60° to 80°. Bed temperatures should be between 60° and 70° to facilitate intensive cocoon production and hatching. If bed temperatures rise too high, they may be lowered by adding water, activating fans in or near the system, and reducing the amount of feedstock applied.

### Moisture

Earthworms need adequate moisture to help them breathe through their skin. Beds need to sustain a moisture range of 60 to 85 percent and feel crumbly-moist, not soggy-wet. They should be sheltered from direct sunlight so they do not dry out and overheat. One method of increasing cocoon production after worms are fully established is to stop watering the beds for several days or until the top 1 or 2 inches are scarcely moist. Then dampen the beds enough to restore them to their recommended moisture content.

## Aeration

Earthworms can survive in relatively low oxygen and high carbon dioxide environments and even stay alive when submerged in water if it contains dissolved oxygen. If there is no oxygen, however, earthworms can die. Oxygen may be depleted if earthworm beds are kept too wet or if too much feed is introduced. By reducing the amount of moisture, cutting back on feed, and turning the pile with a pitchfork or three-prong garden tool, oxygen will be restored. Turning the materials in the beds every two to three weeks will help keep the beds aerobic.

## pH (acidity-alkalinity)

The pH of soil indicates whether it is acidic (1 to 6), neutral (7), or alkaline (8 to 14). Earthworms will grow in a pH range of about 4.2 to 8.0. For commercial production, however, earthworm beds should be kept at a pH range of 6.8 to 7.2. If an acid condition is detected in an earthworm bed, agricultural lime (calcium carbonate) may be mixed with bedding material to remedy the condition.

### 6.5.5 Setting Up an Earthworm-Growing Operation

The first question to ask when considering starting a vermiculture or vermicomposting facility is, “How can I market the product(s)?” not “How will I produce the product(s)?” In a County operated vermiculture facility the primary purpose is to divert organic material from the landfill so that less emphasis will focus on the profit motive. However, once a composting facility is established the County may wish to transfer operation and ownership of the vermiculture operation to a private entity. In this case the potential for profitability should be demonstrated. Other questions to consider include:

- Does the Okanogan County region have marketing opportunities for earthworms and castings?
- Who are competitors, if any, in Okanogan County? Is it fair to go into competition with the private sector?
- What physical resources are currently available (land, buildings, machinery, labor)?
- Will the County work solo or in partnership with others?

It is anticipated that further investigations will be completed prior to implementing earthworm farming at the Okanogan County Central Landfill. The following table provides an on-topic resource summary of periodicals, books, manuals and websites. Books and manuals listed below are available from the engineer for SWAC members and other parties interested in this project (Summary of Resources Provided by North Carolina State University):

- Periodicals
  - BioCycle Journal of Composting and Organics Recycling  
([www.jgpress.com](http://www.jgpress.com))
  - Casting Call ([www.vermico.com](http://www.vermico.com))

Worm Digest ([www.worndigest.org](http://www.worndigest.org))

In Business ([www.jgpress.com](http://www.jgpress.com))

Entrepreneur ([www.entrepreneur.com](http://www.entrepreneur.com))

- Books and manuals (find vendors by typing in titles on an internet search engine)

Commercial Vermiculture: How to Build a Thriving Business in Redworms by Peter Bogdanov (1996).

Raising Earthworms for Profit by Earl Shields (1994-revised).

Earthworms for Ecology & Profit, Vols. 1 & 2 by Ronald Gaddie, Sr., and Donald Douglas (1977).

Profitable Earthworm Farming by Charlie Morgan (1975, revised). Other titles by Morgan include Earthworm Selling and Shipping Guide; Earthworm Feeds and Feeding; and The Worm Farm.

- Websites (use an Internet search engine.)

Worm growers

Vermiculture clearinghouses

Vermicomposting experts

### 6.5.6 Design Considerations for Vermiculture Process

Choosing whether to set up a worm-growing operation indoors or outdoors depends on climate, the type of system to be used, available finances, and goals for worm production. As mentioned earlier, redworms tolerate temperatures between 55° to 80° F. The closer the temperature is to the extremes, the less active the worms will be at feeding and reproducing. For maximum earthworm production, temperatures should be maintained between 60° and 70° F. Providing this level of climate control will require providing shelter and insulation that can hold heat in the winter and cool the system during the summer.

The County should verify that water and electricity can be supplied to the site. Plenty of water is needed to keep the worm beds moist. Electricity is needed for lighting and temperature control, such as fans to cool the worm beds and auxiliary heating systems for warmth. Lights are the most effective method for preventing worms from leaving their bins.

#### Bedding Materials

Practically any organic residue, including plant wastes and most bulky animal manures, may be used for bedding. Horse and rabbit manures are considered ideal bedding materials. Some growers prefer to mix sandy loam topsoil with the bedding material, but this is not necessary. It also increases handling time and costs and may even reduce yields.

Earthworm bedding should retain moisture, remain loose, and not contain much protein or organic nitrogen compounds that readily degrade. These compounds would be quickly degraded with the release of ammonia, and this might temporarily increase the pH of bedding material to 8 or higher, which is not good for the worms.

The bedding material will heat up in the beds if it has not already substantially decomposed or if it contains excessive amounts of readily degradable carbohydrates. These conditions can cause the worms to die. Hence, materials of this type should be composted, or aged beyond the heating stage by forming them into piles. Supplemental nitrogen can be added if needed in the form of inorganic nitrogen fertilizers, blood meal, chicken manure, or urea at the beginning of the composting process.

### **6.5.7 Feeding Worms**

Earthworms will consume animal manures, compost, food scraps, shredded or chopped cardboard or paper, or almost any decaying organic matter or waste product. Horse, rabbit, swine, dairy, or steer manures are excellent feeds. If feeds are low in nutrients, they may be supplemented with chemical addition (nitrogen). Other high nitrogen materials such as grains, mashes, and cottonseed meal may be used to meet the fertilizer needs of the process. Feeds containing high amounts of carbohydrate or woody residues should be composted rather than used as feedstock for the vermiculture process.

The worms must be fed regularly, once or twice a week. Set the feeding schedule and amount of feed according to the rate of consumption of the last feeding and the condition of the worms and beds. When most of the feed has been consumed, it is time to feed again.

### **6.5.8 Harvesting**

Earthworm beds are harvested regularly, about every 30 days, to optimize worm production. Thinning the population provides more feed and space for the remaining worms and keeps the bedding loose and porous so the worms can move more easily to eat and reproduce.

### **6.5.9 Earthworm Pests**

Earthworm pests are birds, rats, snakes, moles, mice, gophers, toads, and other insects or animals that feed on worms or molest them. Arthropods such as mites and ants are probably of the greatest concern to earthworm growers.

#### **Mites**

Mites are natural inhabitants of manures and similar organic materials. All worm beds contain small populations of mites, which under certain conditions may reach extremely high levels. If worm beds are not cared for properly, acidity can build up and create conditions that allow mites to thrive. This problem can be minimized by checking pH and add agricultural lime if the pH is less than 6.8.

#### **White or Brown Mites**

White or brown mites are not predaceous and tend to feed only on decaying or injured worms. During infestations, however, these mites can devour much of the food in earthworm beds, depriving worms of needed nutrients. This increases worm growers'

costs and time spent feeding worms. Mite populations at high levels also can cause worms to stay deep in the beds and not come to the surface for feeding, resulting in poor growth and reproduction.

#### Red Mites

The red mite is parasitic to earthworms. It attaches itself to the worm and sucks its blood or body fluid. Red mites also are capable of piercing and sucking fluids from egg cocoons.

#### Mite Prevention

The best control for earthworm mites is prevention. Proper care of worm beds can prevent a harmful buildup of mites. Bed conditions ideal for worm production are not conducive to high mite populations. Conversely, beds with high mite populations are being improperly managed for optimum worm production. One or more of the following conditions are usually associated with high mite populations:

- Too much water—Beds that are too wet create conditions that are not favorable
- Overfeeding—Adjust feeding schedules so that all feed is consumed within a few days.
- Modify feeding schedules as the seasons (and temperatures) change.

#### Ants

Several species of ants may occasionally be a problem or annoyance to worm growers. Ants are attracted to high-concentrate feed in worm beds, and some species are reported to feed on eggs and small worms. Physical barriers can be placed around worm beds to keep ants out. Ants can be controlled with baits and insecticidal sprays outside the bins, but take precautions to prevent injury to the worms.

## 6.6 Anaerobic Digestion

Anaerobic digestion is a series of processes in which microorganisms break down biodegradable material in the absence of oxygen, used for industrial or domestic purposes to manage waste and/or to release energy. It is widely used as part of an integrated waste management systems, anaerobic digestion reduces the emission of landfill gas into the atmosphere.

Anaerobic digestion is used as a renewable energy source because the process produces a methane and carbon dioxide rich bio gas suitable for energy production, helping to replace fossil fuels. The digestion process begins with bacterial hydrolysis of input materials in order to break down insoluble organic polymers such as carbohydrates and make them available for other bacteria. Acidogenic bacteria then convert the sugars and amino acids into carbon dioxide, hydrogen, ammonia, and organic acids. Acidogenic bacteria then convert the resulting organic acids into acetic acid, along with additional ammonia, hydrogen, and carbon dioxide. Finally, methanogens convert these products to methane and carbon dioxide.

The technical expertise required to maintain industrial scale anaerobic digesters coupled with high capital cost and low process efficiencies has limited levels of industrial application of waste treatment technology.

## 6.7 Landfill Bioreactor

A bioreactor landfill operates to rapidly transform and degrade organic waste. The increase in waste degradation and stabilization is accomplished through the addition of

liquid and air to enhance microbial processes. This bioreactor concept differs from the traditional “dry tomb” municipal landfill approach.

A bioreactor landfill is not just a single design and will correspond to the operational process invoked. There are three different general types of bioreactor landfill configurations:

- **Aerobic:** In a aerobic bioreactor landfill, leachate is removed from the bottom layer, piped to liquid storage and re-circulated into the landfill in a controlled manner. Air is injected into the waste mass, using vertical or horizontal wells, to promote aerobic activity and accelerate waste stabilization.
- **Anaerobic:** In an anaerobic bioreactor landfill, moisture is added to the waste mass in the form of re-circulated leachate and other sources to obtain optimal moisture levels. Biodegradation occurs in the absence of oxygen (anaerobically) and produces landfill gas. Landfill gas, primarily methane, can be captured to minimize greenhouse gas emissions and for energy projects.
- **Hybrid:** (aerobic-Anaerobic)- The hybrid bioreactor landfill accelerates waste degradation by employing a sequential aerobic-anaerobic treatment to rapidly degrade organics in the upper sections of the landfill and collect gas from lower sections. Operation as a hybrid results in the earlier onset of methanogenesis compared to aerobic landfills.

The Solid Waste association of North America (SWANA) has defined a bioreactor landfill as “any permitted Subtitle D landfill or landfill cell where liquid or air is injected in a controlled fashion into the waste mass in order to accelerate or enhance biostabilization of waste.” The United States Environmental Protection Agency (EPA) is currently collecting information on the advantages and disadvantages of bioreactor landfills through case studies of existing landfills and additional data so that EPA can identify specific bioreactor standards or recommend operating parameters.

## 6.8 Other Technologies

- Gasification, Carbon Capture, Pyrolysis, Plasma Arc Gasification, are a sample of but not limited to very new technologies or an improvement on old technologies that warrant monitoring to see if they would work and are economically feasible for small landfill operations.
- Cool Plasma Gasification: A power point presentation for adaptive ARC presented to the SWAC committee looks very promising for smaller operations.

## 6.9 Recommendation

The County Solid Waste Advisory Committee (SWAC) reviewed waste processing technologies recommendations during a meeting in September 2010.

**Recommendation 6-1: Monitor Status of Processing Technologies.** The County will continue to monitor the status of processing technologies. If any technologies appear feasible, the County will inform the SWAC and pursue further investigations as appropriate. A Plan amendment will be developed if an alternative technology is chosen as a future disposal method.

**Table 6-1. Implementation and Operation Timeline**

RECOMMENDATION		2011	2012	2013	2014	2015	2016
R6-1	MONITOR TECHNOLOGIES						

**Cost (Staff Hours/Cost in Dollars)**

RECOMMENDATION	2011		2012		2013		2014		2015		2016	
	STAFF	COST										
R6-1	N		N		N		N		N		N	

N - Negligible

<b>Chapter 7</b>	<b>Collection</b>
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This chapter describes route-based solid waste collection systems, focusing primarily on refuse collection. Collection through County-operated transfer stations is discussed in Chapter 8 – Transfer and Import/Export.

## **7.1 Existing Conditions**

### **Regulatory Environment**

Solid waste collection in Okanogan County is regulated under three authorities: the Washington State Utilities and Transportation Commission (WUTC), municipal collection contracts with some cities, and tribal government on Colville Nations lands. The County has no authority to operate or contract for garbage collection services except in the case where no WUTC-certificated hauler is willing to provide service. However, counties do have authority to provide for recycling collection services via contract or through a service level ordinance directing WUTC-certificated haulers to provide services and include the costs in their rates.

The WUTC regulates solid waste collection companies (“haulers”) under the authority of RCW 81.77. In brief, the law provides for regulated garbage collection companies to operate within specified geographical (and certificated) areas. These certificated areas are typically exclusive, although in some cases more than one hauler has rights to a particular area. Haulers charge uniform rates, subject to WUTC approval across each certificated area. Haulers must provide collection services at the specified tariffs to all customers within their certificated area. The original certificates were awarded in 1961. These certificates are perpetual unless a hauler fails to offer adequate service, cedes, or sells all or part of their certificated area to another hauler.

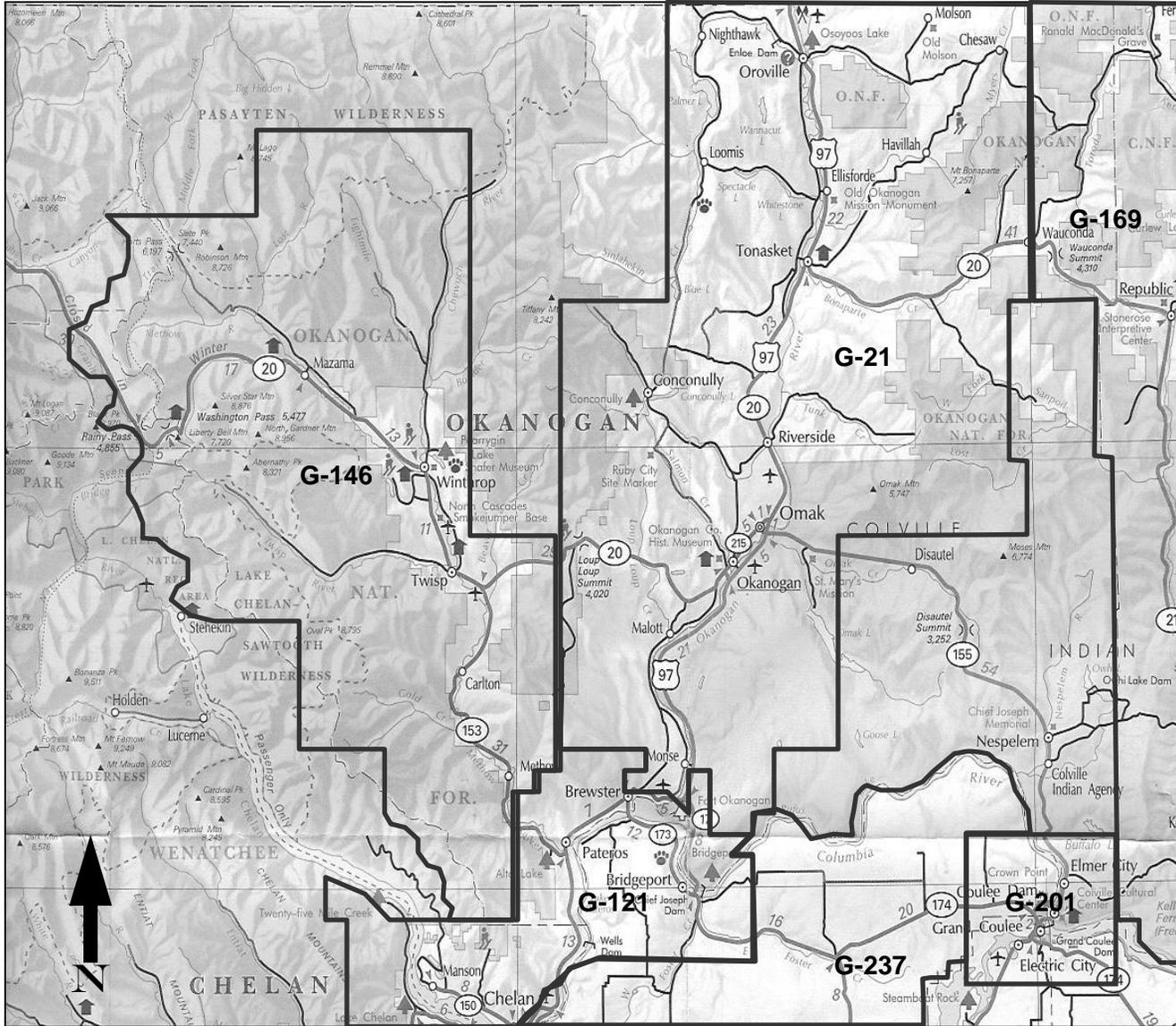
Haulers prepare rate filings to the WUTC for services consistent with the Plan and the county service level ordinance (if any). The WUTC evaluates and then approves, denies, or suspends proposed rates as well as providing general regulatory oversight. Ratepayers, through an annual fee paid by the hauler, pay for WUTC rate review and regulatory oversight service.

Certificated collection companies operating in Okanogan County are listed in Table 7-1. Couse’s Sanitation & Recycle, Incorporated, Zippy Disposal Service, and Washington Waste Hauling & Recycling, Incorporated all have very small portions of their certificated areas within Okanogan County and therefore have a minimal customer base within the County.

# Certificated Collection Areas

FIGURE 7.1

## OKANOGAN COUNTY



Geographical areas covered by certificated haulers are shown on Figure 5-1. Note that these areas are the approximate certificate boundaries, not necessarily areas in which the respective company has customers.

Cities have the option of providing for solid waste collection either through municipal crews, contracted services, or deferring to WUTC-certificated haulers. If cities do not elect to exert local authority over collection, collection services will be provided by the hauler with the underlying certificate for the geographical area that includes the city.

Within Okanogan County, the Cities of Brewster, Coulee Dam, Elmer City<sup>8</sup>, Okanogan, Omak, Oroville, Pateros, and Riverside have municipal contracts for residential and commercial solid waste collection. The Cities of Conconully, Tonasket, Twisp, and Winthrop have not asserted local authority and consequently are serviced under WUTC authority. Table 7-2 lists collection companies operating within each city and the population of each city.

**Table 7-1. WUTC-Certificated Collection Companies in Okanogan County**

Firm	WUTC Cert. Number	Service Area Pop/mile <sup>2</sup>
Couse's Sanitation & Recycle, Inc. 22 Smith Drive Republic, WA 99166	G-169	0.4
Methow Valley Sanitation Service, Inc. P.O. Box 656 Twisp, WA 98856	G-146	2.8
Okanogan Valley/Upper Valley Disposal Route 2, Box 484 Oroville, WA 98844	G-21	3.1
Sunrise Disposal, Inc. P.O. Box 1267 Okanogan, WA 98840	G-201	1.8
Zippy Disposal Service P.O. Box 1717 Chelan, WA 98816	G-121	2.8
Waste Management of Washington 13225 NE 126th Place Kirkland, WA 98034	G-237	1.3

### Collection Systems

Two of the WUTC-certificated areas are entirely within the Colville reservation: Sunrise Disposal, Inc. (G-201) and Waste Management of Washington (G-237). MSW from those areas is typically delivered to the Central Landfill, although a portion of MSW collected in the eastern Colville reservation is delivered to the Delano Landfill in Grant County. As the majority of these wastes are currently delivered to the Central Landfill, these areas are de facto considered to be part of the solid waste planning area, though the Colville Confederated Tribes retains jurisdictional control of solid waste management within the reservation boundaries. As the majority of these wastes are

<sup>8</sup> Coulee Dam and Elmer City are not within the planning area.

currently delivered to the Central Landfill, these areas are de facto considered to be part of the solid waste planning area, though the Colville Confederated Tribes retains jurisdictional control of solid waste management within the reservation boundaries through their own Solid Waste Comprehensive Management Plan.

Couse's Sanitation and Recycle, Inc., located in the far eastern portion of the County currently delivers collected MSW to Ferry County facilities due to geographical constraints that make delivery of MSW to the Central Landfill or an existing transfer station impractical.

All cities and certificated areas within Okanogan County have residential collection based on customer-owned 32-gallon cans or contractor-owned wheeled carts. Sunrise Disposal, Zippy Disposal Service, Waste Management, and Couse's Sanitation & Recycle all offer micro and/or mini-can service levels and in some cases reduced frequency (every-other-week or monthly) service at a lower cost. At the other end of the spectrum, Omak, Okanogan and Oroville offer a 65 gallon minimum level of residential service.

Commercial collection is provided through a variety of containers, including cans, carts, detachable containers ("Dumpsters"), and drop-boxes. Almost any configuration of container may be used for commercial collection provided that the container meets local municipal and health codes.

**Table 7-2. Solid Waste Collection in Okanogan County Cities**

City	Collection Company	2010 Population
Brewster	Sunrise Disposal, Inc.	2,630
Conconully	Upper Valley Disposal/WUTC	215
Nespelem	Colville Nations	205
Okanogan	Sunrise Disposal, Inc.	2,5004
Omak	Sunrise Disposal, Inc.	4,780
Oroville	Municipal Crews	1,755
Pateros	Zippy Disposal Service	635
Riverside	Sunrise Disposal, Inc.	330
Tonasket	Upper Valley Disposal/WUTC	1,010
Twisp	Methow Valley Sanitation/WUTC	995
Winthrop	Methow Valley Sanitation/WUTC	440

### Rates

Rates vary significantly across various service areas in Okanogan County due to differences in hauler size, route densities, and economies of scale. Table 7-3 provides an indication of the variation of rates present in Okanogan County. Only weekly one and two 32-gallon can(s) collection rates are shown for residential customers, and weekly collection of a company-provided one cubic yard container are shown. Carts are offered in some of the more densely populated areas, a 65 gallon cart equals 2 cans, and a 95

gallon cart equals 3 cans. None of the residential rates include curbside recycling, which is not currently offered in Okanogan County. The commercial rate shown includes container rental. State and local taxes are in addition to the rate shown.

**Table 7-3. 2010 Solid Waste Collection Rates in Okanogan County Areas (monthly charges for weekly services)**

Service Area	Residential			Commercial
	Mini can	1 can	2 cans	1 yard
Brewster		16.78	32.48	46.60
Conconully		15.90	21.69	82.97
Nespelem		N/A	N/A	N/A
Okanogan	7.71	13.45	24.07	64.22
Omak	9.00	11.14	18.21	63.44
Oroville		13.50	16.50	68.00
Pateros	12.65	14.85	19.00	61.05
Tonasket		15.90	21.69	82.97
Twisp		13.75	19.35	69.47
Winthrop		13.75	19.35	69.47
Methow Valley Sanitation		13.75	19.35	69.47
Sunrise Disposal, Inc.		11.14	18.21	63.44
Zippy Disposal Service	12.65	14.85	19.00	61.05
Upper Valley Disposal	N/A	15.90	21.69	82.97
Couse's Sanitation & Recycle	8.43	12.90	23.69	2 yd: 131.81

## 7.2 Needs and Opportunities

### Regulatory and Administrative

A number of cities and haulers do not have mini-can or reduced collection frequency residential services. This reduces the incentive for waste reduction and recycling as well as reduce the number of potential customers in rural areas. Residents who recycle and compost less than one can of materials per week, and are in areas without mandatory collection, may not have an appropriately-sized garbage collection alternative and instead may self-haul to avoid paying for excessive services.

Cities with contracts may have the opportunity to reduce customer rates through periodic competitive procurement processes for collection services. The extent to which cities negotiate rather than bid is unknown. The lack of competitive procurement is sometimes raised as an issue by ratepayers.

With the expansion of cities within Okanogan County, some questions might arise as to jurisdiction over collection services in annexed areas. RCW 35.02.160 (RCW 35A.14.900 for Code cities) provides for the orderly cancellation or acquisition of

franchises for public service businesses in territories that have been annexed by cities. A potential conflict exists when unincorporated areas served by WUTC-certificated haulers are annexed by cities using contracted collection services. The law requires annexing cities to purchase rights or grant a franchise of not less than seven years to such businesses. Since most cities in Okanogan County contract with the underlying WUTC-certificated haulers, this has not resulted in conflicts in the past. However, if a city attempted to bid for collection within their entire city limits or contracted with another hauler, a potential conflict between service providers or service levels between areas might exist.

### Disposal and Collection Districts

Needs and opportunities, alternatives, and recommendations related to disposal and collection districts are discussed in Chapter 12 – Administration and Enforcement.

### Rate Structures

Existing residential and garbage collection rate structures are largely based on WUTC cost-of-service formulas. Some cities may wish to encourage additional waste reduction and recycling through the use of incentive rate structures which artificially increase the costs of higher service levels (e.g. 2 and 3 can rates) while reducing lower service levels (e.g. mini-can and one can rates).

### Physical Systems

Unimproved private roads have caused some concern for haulers. At this time, haulers negotiate with residences served by private roads to determine whether housing clusters accessible via private roads can be serviced by collection vehicles. Houses along primitive roads may be assessed a surcharge. If the hauler believes that the private road cannot be safely negotiated by their collection vehicles, the residence(s) are asked to place garbage and recycling containers on the nearest public road.

## 7.3 Alternatives

### Regulatory and Administrative

Alternatives for adding additional levels of service to city contract and WUTC-certificated service areas include:

- In the case of contract cities or Colville Confederated Tribal areas, including additional service levels at the point when contracts are rebid or renegotiated. Cities may need to revisit current municipal codes to ensure that reduced container sizes and/or reduced frequency collection is allowed.
- In the case of WUTC-certificated areas, the County would need to work with haulers to encourage them to include additional service levels within their tariffs. The County may be able to enact a service level ordinance to ensure consistent service levels across the County, although the degree to which this is necessary or advisable is uncertain.

There are two alternatives for the interlocal coordination of recycling services and service boundary changes due to annexation by cities:

- The County could provide technical assistance to cities by drafting a uniform franchise agreement that could be applied each time city boundaries are expanded. The agreement could set a conversion franchise period to clarify ownership issues related refuse containers and define procedures to be used if the affected city bids for solid waste collection services during the period of the conversion franchise.
- The County and Cities could include provisions for coordinating garbage collection services and rate structures for both incorporated and annexation areas, in interlocal solid waste agreements.

### Rate Structures

Rate design alternatives are virtually unlimited. Within WUTC-regulated areas, only their cost-of-service methodology is usually allowed. On the other hand, Cities can shift rates as desired. The following alternatives are available for developing rates:

- **Cost-of-Service:** Cost-of-service rates use a defined methodology to distribute the costs of collection between various customer classes and service levels. Depending on how costs are distributed, the difference between service level rates can be considerable. For example, distributing all costs by container weight results in near-linear rates. Current WUTC cost-of-service formulas are based on distributing most costs by customer, with only disposal costs and other minor costs based on container size. Thus, current cost-of-service rates have moderate differences between various service levels.
- **Linear or Near-Linear:** Linear or near-linear incentive rates are set artificially high to encourage waste reduction and diversion. In the case of linear rates, the charge for two cans of garbage is twice that for one can of garbage. Rates are set to be revenue-neutral to the hauler. These rates are often used in communities with curbside recycling to encourage participation and other waste reduction. This type of rate structure is rarely used unless convenient recycling opportunities are also available.
- **Weight-based Rates:** A number of cities, including Seattle, have experimented with “garbage by the pound” pilots where residents and/or businesses are charged based on the actual amount of garbage placed in their containers. While this type of metered service may be appropriate in the future, current problems with certifying scales make this an evolving option, at best.

### Physical Systems

- Education programs could be implemented to encourage well-designed and constructed private roads. Educational materials could be provided to developers and homebuilders at the time construction permits are submitted or received.
- Customers could be directed to place garbage and recycling containers on the nearest accessible public road.

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## 7.4 Recommendations

Recommendations for City and County collection systems were developed by the County SWAC during a meeting in September 2010.

Recommendations, including implementation responsibilities and procedures, are discussed below. Implementation and operation timeline schedules are provided in Table 7-4. County staffing requirements are expressed in “Full Time Equivalents” (FTEs), where 0.1 FTE is equal to 180 hours of staff time per year.

### Regulatory and Administrative

**Recommendation 7-1: Minimum Container Sizes and Residential Service Levels.** Cities will review existing contracts and city codes to ensure that appropriate garbage service levels and incentives are available to residents and businesses that produce relatively low volumes of waste. Minimum service levels such as 20-gallon mini-cans, single 32-gallon containers or once-per-month collection will be considered and implemented where appropriate. The County will work with WUTC-certificated haulers to expand service level options that encourage waste prevention and recycling.

### Rate Structures

**Recommendation 7-2: Incentive Rate Structures.** Cities and haulers will consider potential incentive rate structures when negotiating or bidding contracts for cities or filing WUTC rates. Incentive rates will be implemented, where feasible, to support waste reduction and recycling goals.

### Physical Systems

**Recommendation 7-3: Private Roads.** Haulers will work with customers to encourage appropriate road maintenance to minimize damage and wear to roads and trucks. When private roads are inadequate, haulers will collect garbage on the nearest public road.

**Table 7-4. Implementation and Operation Timeline**

RECOMMENDATION	2011	2012	2013	2014	2015	2016
R7-1 CONTAINER SIZES	[Redacted]					
R7-2 INCENTIVE RATE STRUCTURES	[Redacted]					
R7-3 PRIVATE ROADS	[Redacted]					

**Cost (Staff Hours/Cost in Dollars)**

RECOMMENDATION	2011		2012		2013		2014		2015	
	STAFF	COST								
R7-1	N		N		N		N		N	
R7-2	N		N		N		N		N	
R7-3	N		N		N		N		N	

N - Negligible



# Chapter 8

# Transfer

Okanogan County operates three transfer stations serving self-haulers and commercial garbage collection companies in the northern, western, and southern portions of the county. This chapter reviews these transfer operations and provides recommendations for the transfer component of the County's solid waste system.

## 8.1 Existing Conditions

As small municipal and County landfills were closed in the 1980s, they were replaced by drop-box transfer stations which were used to transfer wastes to either the Okanogan Landfill or out-of-county as the Okanogan Landfill was closing. All wastes and recyclables from these transfer stations are now hauled to the Central Landfill. The following sections describe each of the transfer stations. Map 8-1 indicates transfer station locations and wastesheds<sup>9</sup>.



### Bridgeport

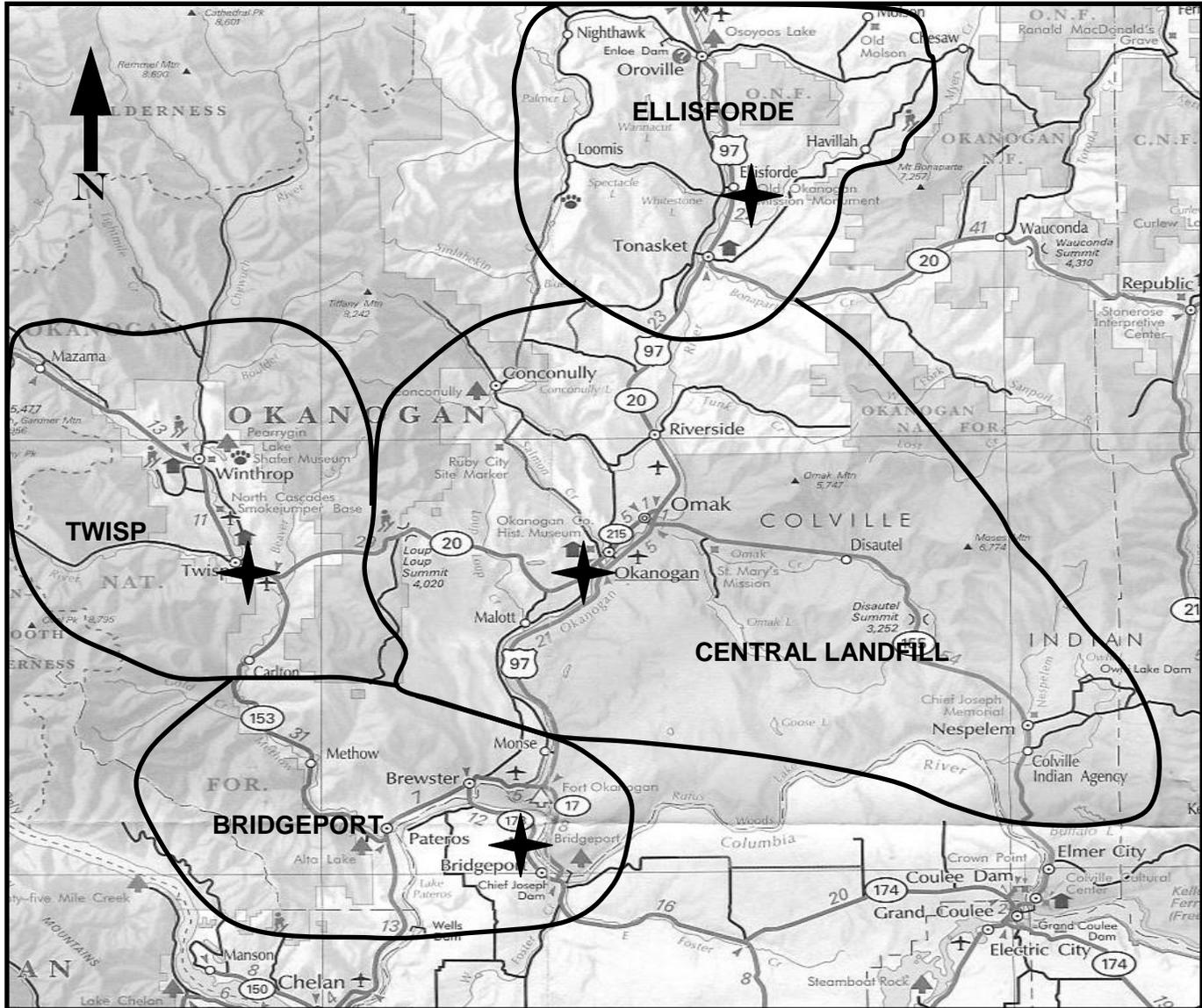
Okanogan County developed the Bridgeport transfer station in Douglas County in 1987. The facility is located at a closed landfill on land leased from Douglas County. Okanogan and Douglas Counties agreed to share construction costs of the facility and to assign operating responsibilities to Okanogan County. Permitting authority remains with the Chelan-Douglas Health District. The wasteshed for this transfer station includes Pateros, Brewster, and the lower Okanogan Valley. The Town of Bridgeport previously used the transfer station, but opted to leave the Okanogan system in 2001. The Bridgeport facility is operated by Okanogan County employees, is open three days per week, and handled 4,794 tons in 2009.

### Ellisforde

The Ellisforde transfer station is constructed on the site of the closed Ellisforde landfill. Start-up operations at the facility began in the fall of 1990 as landfill operations were discontinued. The wasteshed for this transfer station includes Oroville, Tonasket, and the outlying areas of Loomis, Chesaw/Molson, and the Aeneas Valley. The operation of the Ellisforde facility is currently contracted to Upper Valley Disposal, is open five days per week, and handled 5,652 tons in 2009.

<sup>9</sup> A wasteshed is the area from which the disposal facilities draws wastes and is roughly analogous to the term "watershed" as it applies to drainages.

# OKANOGAN COUNTY



## Transfer Stations and Wastesheds

FIGURE 8.1

## Twisp

The Twisp transfer station is directly south of the Town of Twisp and is located on industrial property adjacent to the wastewater treatment plant. The location was selected for convenience and operational suitability since the location of the closed Twisp Landfill offered no suitable transfer site. The watershed for this transfer station includes Twisp, Winthrop, and the Methow Valley. The Twisp facility is operated by Okanogan County employees, is open three days per week, and handled 3,929 tons in 2009.



These three transfer stations are all operated under county authority as part of the County's solid waste system. The Colville Confederated Tribes operates four drop-box transfer stations on the Reservation, two of which are in Okanogan County. The Colville facilities at Nespelem and Disautel transfer waste to the Central Landfill. No other municipal or private transfer stations are currently authorized under this Plan.

The Central Landfill and all County transfer stations charge uniform disposal fees. The costs of operating the transfer stations and hauling drop-boxes to the Central Landfill are funded as part of the overall solid waste management system.

## 8.2 Needs and Opportunities

The existing transfer system has adequate capacity to handle waste quantities for the foreseeable future. Each of the transfer stations handles an annual volume of 70-90 tons per week, with higher waste quantities in the summer and correspondingly lower quantities in the winter. If waste quantities increase significantly or if the County shifts to a waste export disposal system, some changes in handling systems may be necessary. However, these changes (e.g. shifting to open-topped transfer trailers) can be made incrementally, as waste volumes increase.

Although the current drop-box system is not always the best choice for moving large quantities of waste, it allows for frequent container replacement, which can be important during the summer when putrescible wastes rapidly decompose.

An additional transfer station may need to be developed in the eastern portion of the County to adequately service the Nespelem area and the Elmer City/Coulee Dam areas, if the latter cities wish to rejoin the County solid waste system. However, this area is currently outside the planning area and would need careful consideration prior to pursuing expanding the current system.

Some transfer facilities do not currently have a full range of recycling opportunities available to self-haulers. This is addressed in Chapter 4 – Recycling.

At some point in the future, the transfer station serving the Brewster/Pateros area should be relocated from the Bridgeport Bar site to a closer location. While this is a long-term need, it is unlikely that the County will have funds during this planning period to perform activities other than initial siting and feasibility analysis. This transfer station relocation is listed at one of the County's longer term needs for the 20-year planning horizon.

### 8.3 Alternatives

Additional transfer stations might be appropriate to serve the eastern portion of the County. However, the capital and added operating costs would likely cost more than the additional waste volumes would gain the County. Thus, a careful financial evaluation would be necessary to determine whether an additional station could be added without increasing net system costs.

Alternatively, a local transfer station could be developed and operated by a sponsoring jurisdiction (as is currently done on the Colville Reservation), with the Municipal Solid Waste (MSW) transferred to the Central Landfill. This is probably the most cost-effective approach for accommodating the Elmer City/Coulee Dam area, if those cities wish to rejoin the Okanogan County system.

### 8.4 Recommendations

The County Solid Waste Advisory Committee (SWAC) reviewed transfer recommendations during a meeting in September 2010.

Recommendations, including implementation responsibilities and procedures, are discussed below. Implementation and operation timeline schedules are provided in Table 7-1. County staffing requirements are expressed in “Full Time Equivalents” (FTEs), where 0.1 FTE is equal to 180 hours of staff time per year.

**Recommendation 8-1: Continue the Existing Transfer System.** The County will continue to operate the Bridgeport, Ellisforde and Twisp transfer stations. Disposal fees will continue to be uniform at both the transfer stations and the Central Landfill. Capital improvements to facilities and containers will be made, as necessary, throughout the life of the Plan.

**Recommendation 8-2: Evaluate Additional Transfer Station.** If Elmer City and Coulee Dam petition to re-enter the Okanogan County solid waste system, or if operating an additional or replacement facility to serve other populations is considered feasible, the County will evaluate the potential costs and revenues associated with operating an additional facility. The County will operate an additional transfer station only if net revenues meet or exceed the capital and operating costs of the additional facility.

**Recommendation 8-3: Private Facilities.** Private, municipal, and tribal transfer stations are allowed, provided that: (1) they meet all land use, health district, and other agency permitting requirements; (2) they do not detract from the financial viability of the County transfer system; and (3) all collected MSW is delivered to the Central Landfill or other facility designated by the County.

**Table 8-1. Implementation and Operation Timeline**

Recommendation	2011	2012	2013	2014	2015
R8-1 Continue Transfer System					
R8-2 Additional Transfer Sites					
R8-3 Private Facilities					

**Cost (Staff Hours/Cost in Dollars)**

Recommendation	2011		2012		2013		2014		2015	
	Staff	Cost								
R8-1	10660	304876	10660	304876	10660	304876	10660	304876	10660	304876
R8-2	N		N		N		N		N	
R8-3	N		N		N		N		N	



## Chapter

**9****Landfill Disposal**

All Municipal Solid Waste (MSW) delivered to outlying Okanogan County transfer stations and the public drop-off site at the Central Landfill and Recycling Center is currently landfilled. This chapter describes the previously closed landfills within the County and the County's existing landfill capacity, as well as future disposal alternatives.

## **9.1 Existing Conditions**

### **9.1.1 Closed Landfills**

Prior to the early 1990s, a number of small local landfills served various areas of Okanogan County. These landfills were typically unlined and predated modern landfill standards. All of these landfills were closed due to either WAC 173-301 or WAC 173-304 standards prior to the implementation of the more stringent federal Resource Conservation and Recovery Act (RCRA) standards. These closed landfills include the Okanogan, Ellisforde, Twisp, and Pateros landfills.

#### **Okanogan Landfill**

The Okanogan Landfill was operated until shortly after the County's new Central Landfill opened in early 1994. During the 1980s, other landfills were closed, and their wastes were transferred to the Okanogan Landfill. From 1990 (when the Ellisforde Landfill closed) until late 1993, the Okanogan Landfill was the only operating landfill in the County. The Okanogan Landfill's proximity to the Okanogan Municipal Airport was in violation of the location standards of the State's Minimum Function Standards (WAC 173-304 (130)). The combination of location standards, physical limitations at the site, and the federal permit complications of the landfill's location within the Colville Reservation resulted in active efforts to site a new landfill and resulted in the Okanogan Landfill's closure in 1994, once the Central Landfill was operational. The site was closed to WAC 173-304 standards and is currently in the post-closure monitoring phase.

#### **Ellisforde Landfill**

The County-owned Ellisforde Landfill was closed in September 1990. This closure was necessitated by the depletion of capacity, physical limitations that prevented expansion, and the high costs of maintaining and operating a small landfill as regulations became more stringent. The site was closed to WAC 173-304 standards, and is currently in the post-closure monitoring phase.

#### **Pateros Landfill**

The Pateros Landfill is owned and was operated by the City of Pateros, and ceased accepting waste in May 1987. The landfill contains approximately 16,380 cubic yards of household waste, construction debris, and yard waste. The site was closed to WAC 173-301 standards, and is currently in the post-closure monitoring phase by the County.

### Twisp Landfill

The Twisp Landfill was closed in 1986 in accordance with recommendations from the 1984 Solid Waste Plan. Closure was accomplished in accordance with a closure plan accepted by the Department of Ecology. Two groundwater monitoring wells were installed and are currently monitored by County staff.

## 9.1.2 Central Landfill

During the late 1980s, the County accelerated efforts to site a replacement landfill. Preliminary site selection and environmental review of two candidate sites were completed in 1989. In 1990, the SWAC recommended the selection and development of the “Rifle Range South” site, south of the City of Okanogan on the B&O Road. A Conditional Use Permit was granted by the County Board of Adjustment on May 6, 1991. Site design and construction occurred during 1992 and 1993, and the site opened for waste acceptance in early 1994.



The Central Landfill is located on 185 acres of County land, including 40 acres set aside as wildlife habitat mitigation. The site includes an animal shelter, a law enforcement shooting range, and the County Road Department’s gravel pit. The Central Landfill is lined and is fully compliant with current Department of Ecology standards for non-arid landfills. The actual fill footprint will be 24 acres over the 35-40 year planned life of the landfill. As of September 2010, a total of 407,820 tons of MSW had been landfilled in the 14.31 acre Cell #1 and cell #2.

When Cell #1 and #2 reach capacity they will be closed and Cell #3 will be constructed. An additional well was constructed in 2010 on adjoining county property for the purpose of providing another water source to meet the Central Landfill Conditional Use Permit.

The initial capital costs of the Central Landfill were approximately \$4 million. The Landfill was financed through two capital construction bonds, with a current debt service requirement of approximately \$257,400 per year (equivalent to about \$8.46 per ton of landfilled waste). One capital construction bond paid off in 2007 the other capital construction bond will pay off in 2012. Future closure and cell construction will be financed through current operations. Approximately \$537,000 per year, equivalent to about \$17.30 per ton of landfilled waste, is set aside for closure and pre-financing of future cells

All MSW and some construction/demolition wastes generated in the planning area are delivered to the Central Landfill, both through direct haul by generators and collection companies, and through transfer from the three County transfer stations. The Landfill is currently open Tuesday through Saturday.

# Current and Closed Landfills

FIGURE 9.1

## OKANOGAN COUNTY

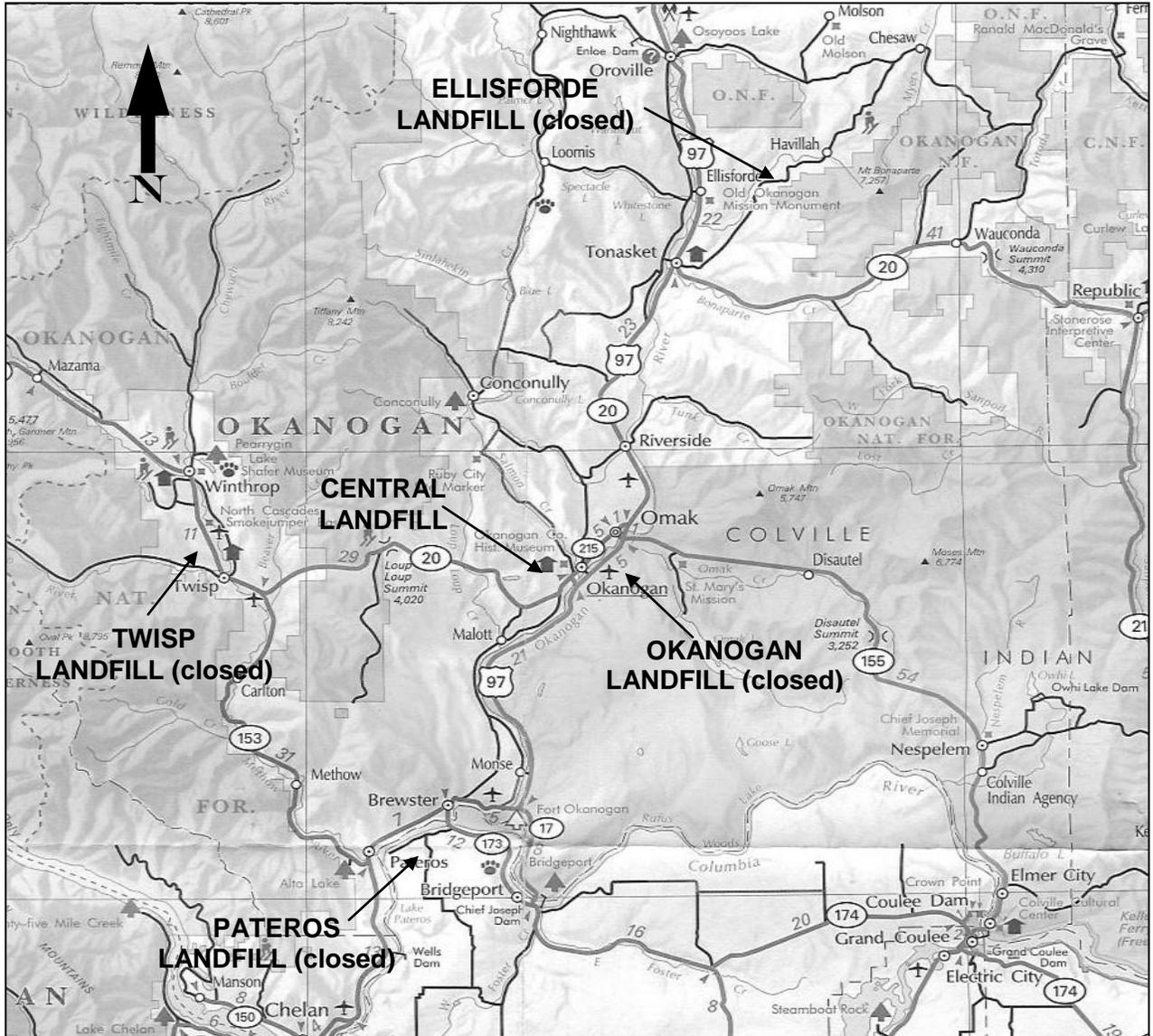


Figure 9-1 indicates the location of previously closed landfills as well as the Central Landfill.

### 9.1.3 Waste Import/Export

Some waste export and import has occurred in past years. In the late 1980s, waste from the Bridgeport Bar and Twisp transfer stations was shipped to the Waste Management, Inc. landfill in East Wenatchee as an interim measure to preserve capacity at the closing Okanogan Landfill. With the development of the Central Landfill, all waste from the Bridgeport Bar transfer station (likely including some MSW originating in Chelan and Douglas Counties) is now transferred to that landfill.

MSW from the Colville Reservation is currently hauled directly to the Central Landfill. Some MSW from the Nespelem area and the eastern portions of the Colville Reservation is delivered to the Delano Landfill, located in Grant County. That 4,000 ton per year landfill is operated by the “four cities” (Coulee Dam, Grand Coulee, Elmer City, and Electric City) who have a joint operating agreement under which the landfill is leased from Grant County. The future of this arrangement is uncertain, as the costs of operating a RCRA-compliant landfill for this size waste stream are likely prohibitive. The four cities are currently working to extend the life of that landfill by lining and expanding the facility.

The 1993 Plan indicated that the County “may consider the acceptance of imported waste from adjacent counties at the current landfill or at the new Central landfill when completed. This consideration will not extend to counties west of the Cascades or to jurisdictions further away in distance.” However, accepting waste from other counties would “require review and recommendation from the SWAC and a plan amendment adopted by the Board of Commissioners and any affected jurisdictions within the planning area.” This language effectively precluded the County from being able to rapidly accommodate other north central Washington waste streams in a timely manner. For example, the County could not provide timely capacity when Ferry County (Republic) needed to obtain alternative disposal capacity. If the County had been in a better position to help its neighboring county, the arrangement would have been mutually beneficial and would have allowed the County to reduce its unit costs at the Central Landfill.



The County’s Conditional Use Permit includes a requirement<sup>10</sup> that “(t)he landfill waste collection shall be limited to Okanogan County, and the service area at Bridgeport Bar. Future contracts for accepting waste from the Bridgeport Bar shall be reviewed for approval by the Board of Adjustment and the Washington State Department of Ecology.” This condition apparently restricts future waste import and would need to be addressed prior to committing to accept waste from outside of Okanogan County.

A feasibility analysis conducted as part of the 1993 Plan development process indicated that waste export would be substantially more expensive than developing a local landfill. Thus, the 1993 Plan was based on the development of the Central Landfill with no allowance

<sup>10</sup> CUP 91-1, condition 17

made for the future consideration of waste export. During the intervening years since the development of the 1993 Plan, it has become apparent that the costs of local landfilling were originally underestimated and the costs of waste export may have been overestimated.

### 9.1.4 Future Disposal

In late 2001, the County issued a Request-for-Proposals to determine whether disposal fees could be reduced by closing the Central Landfill and exporting solid waste to a private regional landfill. Three proposals were received and reviewed by an outside consultant. The consultant review concluded that it would be difficult to determine the precise financial impacts of the proposals without having better tracking data on the relative costs of the various components of the solid waste system. Nevertheless, there did not appear to be any compelling financial advantage to proceed in negotiations with any of the proposers. This analysis was presented to the SWAC and County Commissioners in June 2002.

The County then proceeded with the development of Cell #2A at the Central Landfill to ensure that sufficient capacity would be available in 2003 when Cell #1 filled. The new cell will allow for approximately five years of capacity, which will provide a more reasonable time frame for determining the future direction of solid waste disposal capacity in Okanogan County. With more efficient operations of the landfill cells since 2003 thru 2010 export of Okanogan County Solid Waste would not save monies at this time. The SWAC committee will periodically look at this issue during the planning period.

### 9.1.5 State and County Criteria for Siting Disposal Facilities

One of the requirements for Comprehensive Solid Waste Management Plans is to identify specific locations for future disposal facilities. During the late 1980s, Okanogan County conducted a landfill siting project which resulted in the development of the Central Landfill. Site selection was guided by:

- Application of the mandatory state siting criteria derived from federal standards and state legislation.
- Development of local criteria which recognized local environmental, social, and economic factors.

State and local criteria were used to screen locations initially selected as possessing generally acceptable characteristics for a central landfill. The criteria were applied in a Pass/Fail mode to determine which of the potential sites warranted further suitability analysis and scoring for comparative ratings. The two top-rated sites had detailed contour mapping, geophysical analysis by test boring, and preliminary site design work done to provide data for an Environmental Impact Statement (EIS). The EIS provided detailed information on site suitability and environmental effects needed for final site selection.



### 9.1.6 State Criteria

The following state mandated locational factors were applied to qualify candidate sites for further analysis. Sites not meeting these criteria were eliminated from further consideration.

Sites must not be located:

- Over a Holocene fault, subsidence area, or structurally unstable formation.
- Where the bottom of the fill would be within 10 feet of the seasonally high ground water level.
- Over a sole source aquifer, without demonstrating that groundwater will not be impacted.
- Within 1,000 feet from a down gradient drinking water supply well.
- Where active areas are within a 100-year floodplain.
- Within 200 feet of a stream, lake, pond, river, or in a wetland.
- Within 10,000 feet of an airport runway serving turbojets, or within 5,000 feet of a piston aircraft runway.
- The property line buffer standard is not included in the criteria; 100 feet from non-residential and 250 feet from residential zoned property.
- In habitats of threatened or endangered plants or animals.
- At variance with local zoning codes.
- Within 1,000 feet of a state or national park boundary.

### 9.1.7 Local Criteria - Okanogan County

The following criteria were adopted by the Board of Commissioners, to be applied in addition to the state criteria, in order to qualify a candidate site for further consideration.

Sites must be located:

- Within 20 miles of Omak or Okanogan in order to meet transportation requirements.
- Within one mile of county or state roads and highways in order to reduce access development costs.
- On lands with low agricultural development potential.
- Where the landfill's active areas are capable of being screened from view of public thoroughfares.
- With the space to provide 40 years of disposal capacity.
- With adequate buffering from adjacent residential land use.

- Where they are eligible for development under the Arid Design Standard within the state Minimum Functional Standards to reduce construction and operating costs.
- Not on Colville Reservation lands.

The last criteria was adopted in response to assertion of jurisdiction by the Colville Confederated Tribes and the requirement for submitting the project to federal review under the National Environmental Protection Act (NEPA). Other criteria considered to be implicit in the local site selection process included the requirement that candidate sites be located on reasonable slopes, and the requirement that workable soils be present in quantities adequate for major portions of landfill development and operation.

### **9.1.8 Delineation of Areas Meeting State and Local Criteria**

The application of state and local criteria in the selection process for a central landfill site is documented in a report entitled Central Landfill Siting Process and Recommendation of Sites for SEPA Evaluation (June 1988, Century West Engineering Corporation). This report is attached as Appendix A of the Final Environmental Impact Statement for the Okanogan County Central Landfill (November 1990, Century West Engineering Corporation).

If new in-county disposal capacity becomes necessary for Okanogan County, these reports as well as alternative disposal arrangements will be reviewed to determine the feasibility of locating another landfill within Okanogan County.

## **9.2 Needs and Opportunities**

### **9.2.1 Closed Landfills**

All closed landfills will require post-closure monitoring throughout the statutory monitoring period. This monitoring will need to include water well sampling and testing, gas flare maintenance where installed, and continuous visual monitoring to ensure cover integrity throughout the post-closure period.

### **9.2.2 Central Landfill**

The County will need to continue to work with affected parties to fully implement all Conditional Use Permit requirements<sup>11</sup> related to Central Landfill operation. These conditions include visual screening, fire protection, and other similar conditions to limit adverse impacts.

The Central Landfill is currently operating at an annual tonnage levels below that at which RCRA landfills are normally considered cost-effective. It may be financially advantageous to consider accepting additional tonnage from adjacent Counties. Increased tonnage would allow spreading the fixed costs of operating the landfill over a larger base, and could result in reduced unit costs and/or additional revenues for the County.

<sup>11</sup> Including both the original CUP 91-1 and the 2001 amendment CUP 2001-8.

### 9.2.3 Waste Import/Export

The County will need to better clarify its policies for waste import and export to allow for additional flexibility. Waste import may provide an opportunity for greater economies of scale and reduced unit costs for the Central Landfill. Alternatively, waste export may allow the County to avoid the relatively high fixed costs of maintaining a landfill with the limited size of Okanogan County's waste stream.

### 9.2.4 Future Disposal

The County will need to consider whether the continued operation of the Central Landfill meets County and city objectives for cost, availability, and reliability. Prior to the development of each new cell, there is an opportunity to consider whether an alternative disposal method or waste export may be preferable to making the investment in developing a new landfill cell. The phased design of the Central Landfill allows this decision to be made about every five years, as new cells are developed.

## 9.3 Alternatives

### 9.3.1 Closed Landfills

There are no alternatives to providing statutory post-closure monitoring.

### 9.3.2 Central Landfill

There are no alternatives for complying with the Conditional Use Permit or other regulatory conditions for the operation of the Central Landfill, as long as the landfill operates. If the landfill were replaced by a waste export transfer station in the future, the Conditional Use Permit may require revision and compliance with new or different conditions.

### 9.3.3 Waste Import/Export

#### Waste Import

A number of various waste import alternatives could be considered. Each would require addressing the Conditional Use Permit condition limiting the Central Landfill use to Okanogan MSW.

- The County could continue to restrict the use of the Central Landfill to Okanogan County waste. This would remove the ability of the County to import waste to gain revenue or to reduce unit costs through economies of scale. However, it would ensure that the 30-35 year projected landfill life would be fully realized without expansion beyond the current planned fill area.
- The County could allow waste import from only neighboring counties, including Chelan, Douglas, Grant, and Ferry Counties<sup>12</sup>. This could allow

<sup>12</sup> Whatcom and Skagit Counties do not have direct year-round transportation access to Okanogan County and thus are not feasible users of the Central Landfill.

the benefits of increased economies of scale, while still limiting waste volumes to minimize impacts. This option may be limited by existing contractual and market conditions.

- The County could seek to develop the Central Landfill as a regional landfill in competition with larger private facilities. This would likely require the expansion of the site into the gravel pit area, as well as revising the Conditional Use Permit to allow a much larger operation. However, the County could receive significant financial benefits as a host community if it were able to successfully compete for large disposal contracts.

Waste import would only be a logical policy if the Central Landfill were to continue operation over the term of the import agreements. The County's options for determining future disposal methods (e.g. local landfilling versus waste export) may be constrained if the County has executed one or more interlocal agreements committing its landfill capacity to another jurisdiction.

### Waste Export

Waste export may be a future option (see Section 9.3.4 – Future Disposal, below) if there are compelling financial or operational reasons to shift away from local landfilling. If waste export is considered, the following steps will need to be addressed:

- A transfer station capable of compaction will need to be developed, possibly at the Central Landfill site. The Central Landfill site has a current permit for disposal activities and has scale, office, recycling, moderate risk waste, and equipment maintenance facilities. These facilities would be a necessary part of a transfer operation.
- A comprehensive agreement would need to be developed to address not only disposal price and transportation, but also: waste acceptance practices, how to handle special waste streams (asbestos, metals, dead animals, and other problem wastes), the allocation of responsibility for future liabilities, and back-up contingencies in case of the failure of either the transportation or disposal site.
- A competitive process would need to be carefully performed to select the preferred transportation and disposal contractors.

In the event that waste export is implemented, post-closure monitoring and maintenance of the Central Landfill would continue to be required throughout the post-closure period.

### 9.3.4 Future Disposal

The County has already investigated whether waste export could provide a more cost-effective means of disposal than local landfilling. However, the 2002 Disposal Request for Proposals process lacked sufficient information on the existing costs of various solid waste system components and how they would change under an export scenario. A more complete analysis would include a financial review of all components of the solid waste system, including:

- Administration and planning.
- Rural transfer station operation and hauling (Bridgeport, Ellisforde, and Twisp).
- Moderate Risk Waste facility costs.
- Recycling facility costs.
- Post-closure monitoring and remediation.
- Landfill operation.

Shifting from local landfilling to waste export would not affect the system costs of the first five of the above six components. The landfill could be closed and replaced with a transfer station capable of compaction (quite possibly at the Central Landfill). In short, the main change in the system would be to load transfer trailers and ship waste to another site instead of burying at the Central Landfill site. Many costs would remain roughly similar to existing costs such as those for: county administration, operating the rural transfer system, operating the moderate risk waste/recycling facility, post-closure costs, and providing scaling and loading operations at the main transfer site. This is the fundamental reason why waste export may not be less expensive, even if a \$30-38 per ton disposal fee could be obtained at an out-of-county private regional landfill.

Since the County has committed to constructing the next landfill cell, the next convenient opportunity for shifting to an export system will be in approximately five years. Developing an alternative waste export system would probably require about 18-24 months, including competitive procurement. Thus, the analysis of whether to continue local landfilling or shift to a waste export system could occur in late 2014 or early 2015, approximately two years prior to filling Cell #2B. The results of that analysis could then be used to either proceed with competitive procurement of private landfill capacity, or to provide the basis for the County's development of a successive cell at the Central Landfill.

## 9.4 Recommendations

Landfilling recommendations were reviewed by the County SWAC during a meeting in November 2002.

Recommendations, including implementation responsibilities and procedures, are discussed below. Implementation and operation timeline schedules are provided in Table 9-1. County staffing requirements are expressed in "Full Time Equivalent" (FTEs), where 0.1 FTE is equal to 180 hours of staff time per year.

**Recommendation 9-1: Continue Post-Closure Monitoring.** The County will continue post-closure monitoring of the closed Okanogan, Twist, Ellisforde, and Pateros landfills.

**Recommendation 9-2: Continue Near-Term Operation of Central Landfill.** The County will continue to operate the Central Landfill as the sole disposal facility within the planning area. The County will comply with the Conditional Use Permits and landfill Plan of Operations, as either is amended from time to time, and report annual progress to the SWAC.

**Recommendation 9-3: Waste Import.** The County will consider importing waste from neighboring counties if it is in the County's interest to do so. The importation of MSW from Chelan, Douglas, Grant, or Ferry Counties will be specifically permitted without a Plan amendment, provided that such import is allowed under the Central Landfill's Conditional Use Permit and Operating Permits, as revised from time to time. In the event that importation appears desirable, the County will review specific costs and benefits with the SWAC.

**Recommendation 9-4: Waste Export.** If the County determines that waste export is advisable once Central Landfill Cell #2B is filled, the Central Landfill or an alternative site will be used as an export transfer station. County MSW will then be transported and disposed at an out-of-county landfill. This Plan specifically allows the export of waste from a future County transfer facility, if that disposal method is chosen (see

**Recommendation 9-5:** If waste export is chosen as a future disposal method, the existing Central Landfill may be retained as an inactive but not fully closed facility to provide local back-up to the export arrangement.

Existing waste export by Couse's Sanitation to Ferry County and other export from areas of the Colville reservation will continue to be permitted, subject to interlocal agreement with the destination County, unless the County located an additional transfer station in the eastern portion of the County.

**Recommendation 9-5: Future Disposal.** The County will conduct a comparison of disposal costs at the Central Landfill with an alternative operation of a transfer/export system to other regional landfills two years prior to the expected filling of Cell #3A. The comparison will be brought before the SWAC for review. If waste export appears to meet cost, reliability, management control, and other County and SWAC objectives, the County will proceed with a Request-For-Proposals to determine actual system costs. The County will then either proceed with negotiations to contract a waste export system or develop Cell #3A at the Central Landfill.

**Table 9-1. Implementation and Operation Timeline**

RECOMMENDATION	2011	2012	2013	2014	2015	2016
R9-1 POST-CLOSURE MONITORING	[Shaded bar]					
R9-2 CENTRAL LANDFILL	[Shaded bar]					
R9-3 WASTE IMPORT	[Shaded bar]					
R9-4 WASTE EXPORT	[Shaded bar]					
R9-5 FUTURE DISPOSAL				[Shaded bar]		

**Cost (Staff Hours/Cost in Dollars)**

N - Negligible

Recommendation	2011		2012		2013		2014		2015	
	Staff	Cost								
R9-1	45	1800	45	1800	45	1800	45	1800	45	1800
R9-2	7410	452,400	7410	452,400	7410	452,400	7410	452,400	7410	452,400
R9-3	N		N		N		N		N	
R9-4	N		N		N		N		N	
R9-5							80	15,000		

# Chapter 10

## Special Waste

Special wastes are solid wastes that require special handling and are collected, transferred, recycled, and/or disposed of separately from municipal solid waste (MSW). Household hazardous waste and motor oil are also handled separately, and are addressed in Chapter 10 – Moderate Risk/Hazardous Waste. This chapter describes the management and disposal of special wastes in Okanogan County.

Special wastes outlined in this chapter are:

- Construction, Demolition, and Landclearing Debris (CDL)
- Contaminated soil
- Biosolids (sewage sludge)
- Infectious Waste
- Tires
- White goods/appliances
- Asbestos
- Animal Carcasses

### 10.1 Existing Conditions

#### 10.1.1 Construction, Demolition, and Landclearing Debris (CDL)

Construction, Demolition and Landclearing Debris (CDL) include wastes such as concrete, steel, composition roofing, and wood debris. Minor amounts of metals are also included in this category. The generation of these materials is primarily the result of construction or demolition, landclearing, fire cleanup, and brush or tree removal.

##### Construction and Demolition Debris

Some mixed construction/demolition wastes from construction, remodeling, and building demolition are currently landfilled at the Central Landfill as mixed waste. Large pieces of concrete are crushed before disposal at the Central Landfill. Metal items such as piping and sheet metal are separated at the Central Landfill for recycling as staff time allows. In 2009 a total of 572 tons of ferrous metals and 29 tons of nonferrous metals were recycled at the Central Landfill, including metals recovered from construction/demolition debris.

Most construction materials appear to be burned or landfilled at uncontrolled sites due to the perceived high costs at the Central Landfill.

One private construction landfill, Brett Pit, has been operated by the Bureau of Reclamation. This landfill was used for aggregate-based materials (e.g. gravel, pavement, etc.) resulting from Bureau projects. It is currently closed.

### Wood Waste

Wood waste is accepted at all Okanogan transfer stations and the Central Landfill at the same disposal cost as mixed waste. Any wood waste deposited at transfer stations ends up as mixed waste in the landfill. An unknown amount of wood is recycled or burned on site at other commercial and residential locations.

Colville Indian Plywood and Veneer is a major generator of woodwaste. Woodwaste generated onsite is used to run their powerhouse. Excess power is sold to the Public Utility District (PUD). The business is temporarily closed.

## 10.1.2 Petroleum-Contaminated Soil

Soil could be contaminated as a result of leakage, periodic discharge, or an accidental spill of petroleum products or other toxic materials. Highly contaminated soil cleanup and disposal requires special procedures.

The level of soil contamination determines the method of disposal used. Soil that is not considered hazardous waste is incorporated into the Central Landfill at the \$36.00 per ton. At spill sites, immediate response is handled by fire personnel or the State Patrol. The Department of Ecology (Ecology) then handles the cleanup and directs the material, as appropriate, to a special facility. Hazardous waste sites are outlined in Chapter 11 – Moderate Risk/Hazardous Wastes.

## 10.1.3 Biosolids

WAC 173-308 defines “sludge” as “a semi-solid substance consisting of settled sewage solids, combined with varying amounts of water and dissolved materials generated from a wastewater treatment plant or other source.”

“Biosolids” are defined by RCW 70.95J as “municipal sewage sludge that is primarily organic, semi-solid product resulting from wastewater treatment process, that can be beneficially recycled and meets all requirements of the chapter.”

According to Ecology, facilities in Okanogan County manage biosolids through land application for a beneficial purpose or through lagoon storage. Table 10-1 outlines each facility and the amount of biosolids produced or managed as well as storage or land utilization.

**Table 10-1. 2001 Okanogan County Annual Biosolids Production and Management**

Facility	Facility Type/notes	Annual Biosolids Production/Management	Biosolids Stored	Land Applied	Crops Grown
Brewster	Storing Solids and working on land application	90 dry tons	90 dry tons	0	N/A
Carter Excavation	Septage management facility	224,000 gallons	0	224,000 gallons	Grasses
Conconully	Lagoon system	?	3-5 inches	0	N/A

Facility	Facility Type/notes	Annual Biosolids Production/Management	Biosolids Stored	Land Applied	Crops Grown
Herriman Speedy Septic Tank Service, Inc.	Septage management facility	319,800 gallons	0	319,800 gallons	Grasses
J.A. Wright Construction & Septic Service	Septage management facility	124,155 gallons	0	124,155 gallons	Grasses
Methow Valley Septic Okanogan	Septage management facility	60,000 gallons 26.72 dry tons	0	60,000 gallons 26.72 dry tons	Oat hay/dryland grasses Weed species
Omak	The City began composting operations to produce an EQ product as of 2/01; product is sold to the public.	96.51 dry tons	0	2.78 dry tons	Weed species
Oroville		68.3 dry tons		68.3 dry tons	Native grasses
Pateros		13 dry tons	13 dry tons	0	N/A
Tibbs Plumbing	Septage management facility	68,095 gallons	0	68,095 gallons	Alfalfa
Tonasket	Lagoon system	~3 dry tons	~4.5 dry tons	0	N/A
Twisp		~44.5 dry tons	0	~44.5 dry tons	Oat hay/ grain crops for feed/pasture grasses
Winthrop	Lagoon system – no estimate of stored solids.	N/A	N/A	N/A	N/A

### 10.1.4 Infectious Waste

Infectious waste is defined in WAC 173-303 as “all the infectious and injurious waste originated from infectious, veterinary or intermediate care facility.” This includes animal waste, laboratory waste, needles and other sharps, cultures, blood, tissue, and body parts.

Infectious waste is not accepted at transfer stations, only at the Central Landfill. Businesses must contact the landfill before bringing infectious waste for disposal. There is a minimum charge for infectious waste disposal, as with asbestos. The infectious waste disposal fee is double the standard disposal rate for mixed waste. Upon collection, infectious materials are placed within a pit and immediately covered to avoid exposure to workers and wildlife. In 2009, zero pounds of infectious wastes were disposed of at the Central Landfill.

As of April 2002, needles and sharps from home users are accepted free of charge to encourage proper disposal and reduce exposure to solid waste collection and disposal workers. Residents are asked to bring needles to the landfill in a plastic container such as a pop bottle or drug store sharps container. Sharps are also accepted at the pharmacies within the county and brought to the landfill. The County currently contracts with Stericycle for sharps disposal.



There are three hospitals within Okanogan County and each has disposal of infectious waste through Stericycle services. Mid Valley Hospital in Omak and North Valley Hospital in Tonasket generate 16,695 gallons and 15,742 gallons of material respectively. Okanogan-Douglas County Hospital in Brewster generated 16,224 gallons. There are a total of 19 small quantity infectious waste generators within Omak, Tonasket and Brewster which generate approximately one 15-gallon container per month for pickup by Stericycle.

In December 2002, the County enacted an infectious waste ordinance (Ordinance 2002-7) to ensure that those wastes are properly collected and disposed. In October 2006 the ordinance was updated to include penalties for offenders (Ordinance 2006-7). The ordinance requires generators to properly segregate, package and dispose of infectious wastes and establishes requirements and standards for infectious waste transporters and storage/treatment facilities.

### **10.1.5 Tires**

“Waste tires” are defined by RCW 70.95 as “tires that are no longer suitable for their original intended purpose because of wear, damage or defect.” RCW 70.95.500 disallows tire disposal on land or in water.

Most tires generated in Okanogan County are managed by individual tire stores. A licensed tire hauler is typically paid to ship the collected tires to fuel processors, recycling facilities, or other storage or disposal facilities. Relatively few tires are brought to the County’s Landfill.

The County charges a per-tire fee at all transfer stations and the Central Landfill. Accumulated tires are shipped through a Spokane-based licensed tire hauler to be used as fuel for a nearby cement plant. Last year, 1511 tires were collected, equal to 16.49 tons shipped.

### **10.1.6 White Goods**

White goods include household appliances such as clothes washers and dryers, dishwashers, ranges, refrigerators, and other large household appliances. White goods have long been recycled as light ferrous scrap. More recently, refrigerant regulations for the handling of Freon and chlorinated compressor oil have resulted in the segregation of compressor-equipped appliances at County transfer stations and the Central Landfill.

Appliances are collected at all transfer stations for transport to the Central Landfill. Collected appliances with compressors are drained, with Freon and oils recovered by a certified contractor, and the hulks are currently shipped to a scrap metal processor in Tacoma, WA. County disposal facilities assess a \$4.00 surcharge on appliances requiring Freon and oil recovery to cover the additional handling costs.

In 2009, 572 tons of scrap metal were recycled at the Central Landfill, including appliances. Out of a total of 3,059 appliances accepted, 1,092 contained refrigerants.

### **10.1.7 Asbestos Waste**

Asbestos is a mineral found in the form of long, thin fibers, and is considered to be a carcinogenic air pollutant when inhaled. Asbestos handling, from site removal to

disposal, is regulated by the National Emission Standards for Hazardous Air Pollutants (NESHAP) (40CFR Part 61 Subpart M). Asbestos is commonly landfilled, since after it is buried it is not considered to be a threat.

Asbestos can only be disposed at the Central Landfill in Okanogan County. In 2009, 11.43 tons of asbestos were disposed at the Central Landfill facility. The charge for disposing of asbestos is double the fee of regular municipal solid waste disposal and is subject to a minimum charge, regardless of quantity. Asbestos is accepted only on specific days of the week, and must be wrapped in heavy duty plastic. Businesses or residents disposing of asbestos must call ahead before visiting the landfill. Each asbestos load is placed in a designated area of the landfill that is registered with the local health district and Ecology.

### **10.1.8 Animal Carcasses**

While some dead animals are rendered or managed on site, others are accepted at the Central Landfill. Small animals need to be triple bagged and the attendant informed of the disposal (particularly for veterinary animals). Large animals must be disposed of at the Central Landfill and must be dead upon arrival. The fee for large animals is \$25.00 plus an additional weight charge for extra handling. Specific conditions regarding the times of acceptance, special handling and fees are addressed by the County's operating policies. The current disposal system functions adequately and no additional measures are necessary.

## **10.2 Needs and Opportunities**

### **10.2.1 Construction, Demolition and Landclearing Debris (CDL)**

The County needs to ensure that construction/demolition wastes are properly handled through either disposal or recycling, as discussed in Chapter 4 – Recycling.

Additional materials could be recovered, such as gypsum, wood waste, and crushed concrete.

### **10.2.2 Petroleum Contaminated Soil**

There is not currently a clear set of procedures for preventing and dealing with petroleum contaminated soil (PCS) at the Central Landfill. A specific plan and a better publicized acceptance level standard is needed to prevent improper disposal of PCS containing hazardous levels of contaminants.

The landfill's operating permit does not currently specify the cleanup levels needed to be reached before acceptance, or the protocols employed to make sure what's being accepted meets the standards. These acceptance standards and protocols will need to be addressed in the next permit.

There is not currently a PCS remediation facility in Okanogan County. PCS which cannot be remediated on site and exceeds the maximum contaminate levels for landfill cover at the Central Landfill must be exported out-of-county at great cost. There is a need for a local facility to reduce the costs of managing PCS.

### **10.2.3 Biosolids**

No sludge or biosolids are currently landfilled. No additional programs are needed other than continued Ecology or Health District<sup>13</sup> enforcement.

### **10.2.4 Infectious Waste**

Most infectious waste generated by health care providers in Okanogan County appears to be handled privately and shipped out-of-county. However, additional disposal alternatives (e.g. at transfer stations) may be necessary to increase proper disposal of infectious waste generated in households. Additional attention on managing home-generated, dental and veterinary infectious waste is needed, as well as promoting and enforcing the County's new infectious waste ordinance 2006-7 on October 16, 2006.

### **10.2.5 Tires**

No needs or opportunities were identified for tires, other than support for continued state and regional efforts for researching alternative markets.

### **10.2.6 White Goods**

Currently there are no strong incentives to discourage illegal dumping of items to avoid disposal costs. Economic incentives for proper disposal and stronger penalties for illegal disposal may need to be considered. Reuse alternatives for working appliances could be investigated to reduce county processing and recycling costs.

### **10.2.7 Asbestos**

There should be a decrease in asbestos disposal since relatively few buildings still use the material. Until the volume sharply decreases, options should be determined for businesses and residents that are not close to the landfill in order to ensure proper disposal. Providing public education regarding the dangers of asbestos would also encourage residents and businesses to handle asbestos-containing materials properly.

The County should have clear standards for how asbestos needs to be handled before disposal.

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<sup>13</sup> If the Health District elects to take delegation for parts or all local biosolids regulation.

## 10.3 Alternatives

### 10.3.1 Construction, Demolition, and Landclearing Debris (CDL)

Alternatives for managing construction, demolition and Landclearing debris include:

The County and Cities could incorporate building permit requirements that require builders to document the destination of construction/demolition wastes. These requirements would likely increase the flow of construction /demolition materials to the Central Landfill or other permitted out-of-county facilities, and could also increase recycling, as discussed in Chapter 4 – Recycling.

The County could implement a differential tipping fee for construction/demolition waste where a lower charge was assessed for inert waste. This may attract more inert waste to the landfill, offsetting the revenue loss due to the lower tipping fee. However, if more waste were not actually attracted to the landfill from improper disposal, the County would experience a net revenue loss.

### 10.3.2 Petroleum Contaminated Soil

Alternatives for proper disposal and prevention of contaminated soil:

- The County could require or perform on-site testing of contaminated soil to determine if it is safe for landfilling or needs to be handled through Ecology-permitted specialized treatment or disposal facilities.
- The Central Landfill could become a remediation site for contaminated soil, with treatment provided prior to use as landfill cover.
- To prevent spills in the first place, the County could provide education to businesses more prone to spills about prevention and handling procedures.

### 10.3.3 Biosolids

No alternatives for biosolids management have been identified. Current land spreading and composting practices are expected to be suitable and effective throughout the planning period.

### 10.3.4 Infectious Waste

Alternatives for infectious handling include:

- The County could provide general and targeted education to limit the improper disposal of infectious waste. General education could include a notation on proper infectious waste disposal in County promotional materials. Targeted promotion could include letters to home health care organizations and infectious associations asking them to remind clients that improper disposal of infectious waste unnecessarily exposes solid waste collection and disposal workers to infectious materials and that appropriate alternatives are available.

- The County could increase screening activities to identify improper disposal of infectious or infectious waste. This screening could be performed on a periodic or continuous basis in conjunction with other screening programs (e.g. asbestos). If infectious wastes are encountered, their source could be determined and the County could directly address proper management with the generator.
- The County could accept infectious waste at transfer stations, with the collected material either transferred to the Central Landfill for sharps collection or disposal, or a contracted transporter could be retained to provide collection and disposal directly from the transfer stations.

### **10.3.5 Tires**

Alternatives for tire management include:

- The County could work with the private sector to encourage local market development of remanufacturing uses for used tires. A number of small-scale uses for tires might be feasible if local entrepreneurial interest allows.
- The County would investigate the feasibility of structural uses for used tires. One option might be to use using shredded tires for road base at the Central Landfill and/or transfer stations, or other County or city facilities.
- The County could investigate additional out-of-County recycling opportunities for tires and consider whether it would be appropriate to pay an additional disposal amount to favor recycling over disposal.

### **10.3.6 White Goods**

Alternatives for white goods disposal include:

- The County could identify repair and donation possibilities for some appliances before turning them into scrap. While this alternative could reduce the need to process refrigerators, freezers and other appliances, it may be counterproductive for very old appliances that are not energy efficient. Appliance acceptance programs in some jurisdictions discourage or disallow reuse due to supporting energy conservation.
- The County could offer incentives for proper disposal of white goods (i.e. annual discount coupons, collection days) to avoid illegal dumping. These programs could serve to reduce the generator cost and inconvenience of disposing of old appliances, but may result in a loss of some existing revenues for the Central Landfill.

### **10.3.7 Asbestos**

Alternatives for proper disposal of asbestos include:

- The County could expand the screening of incoming waste to ensure that asbestos is properly handled. Some common items such as old vinyl flooring and ceramic siding commonly disposed as municipal solid waste may

contain asbestos and would be candidates for a more intensive screening program. If the County were to increase screening activities, some consideration should be given to how to deal with customers unwilling to pay extra or handle the materials separately, and proceed to leave the disposal site. More aggressive screening policies may inadvertently lead to increased illegal disposal.

- The County could establish more firm requirements for disposal of asbestos, such as requiring it to be contained within two plastic bags of a certain thickness. An effective trade-off will need to be made between the need for containment and the need to encourage homeowners and contractors to identify and separately handle asbestos.
- The County could accept double-bagged asbestos waste at transfer stations, with separate storage and transportation to the Central Landfill.

## 10.4 Recommendations

Special waste recommendations were developed by the County SWAC during a meeting in December 2010.

Recommendations, including implementation responsibilities and procedures, are discussed below. Implementation and operation timeline schedules are provided in Table 10-2. County staffing requirements are expressed in “Full Time Equivalents” (FTEs), where 0.1 FTE is equal to 180 hours of staff time per year.

**Recommendation 10-1: PCS Acceptance and Remediation.** The County will continue and enhance monitoring contaminated soil deliveries at the Central Landfill to ensure that maximum contamination levels are not exceeded for material directly used as landfill cover. The County will investigate the feasibility of establishing a PCS remediation area at the Central Landfill. If feasible and cost effective, the County will develop a remediation site, with the remediated soil used as landfill cover.

**Recommendation 10-2: Infectious Waste.** The County will periodically monitor incoming solid waste at transfer stations and the Central Landfill to determine the presence of infectious waste. If significant quantities are observed, the source will be determined and the County will inform the generator of the need to handle infectious waste separately to limit worker exposure to infectious wastes and sharps. If continuing quantities of infectious waste are noted in incoming solid waste, the County will work with local health care and professional organizations to provide notification of proper disposal methods for infectious waste. The County will investigate the feasibility of accepting infectious waste at transfer stations and will implement if cost-effective.

**Recommendation 10-3: Tire Management.** The County will periodically investigate alternative tire management methods to determine whether additional in-county reuse or recycling might be possible. If feasible and cost-effective, the County will support in-county tire reuse and recycling alternatives.

**Recommendation 10-4: White Goods.** The County will investigate the financial and operational impacts of offering discounts, city-sponsored collection events, amnesty days or other methods to divert white goods from illegal dumping or improper

accumulation. If feasible, the County (and cities) will proceed with recycling incentives for white goods.

**Recommendation 10-5: Asbestos.** The County will periodically monitor incoming solid waste at transfer stations and the Central Landfill to determine the presence of asbestos. If significant quantities are observed, the source will be determined (if possible) and the County will inform the generator of the need to handle asbestos separately to limit the exposure of workers and other solid waste site users to asbestos fibers.

**Table 10-2. Implementation and Operation Timeline**

Recommendation	2011	2012	2013	2014	2015
R10-1 PCS Remediation					
R10-2 Infectious Wastes					
R10-3 Tire management					
R10-4 White Goods					
R10-5 Asbestos					

**Cost (Staff Hours/Cost in Dollars)**

N - Negligible

Recommendation	2011		2012		2013		2014		2015		2016	
	Staff	Cost										
R10-1	30	680										
R10-2	16	300	16	300	16	300	16	300	16	300	16	300
R10-3	8	150	4	74	8	150	4	75	8	150	4	75
R10-4	N		N		N		N		N		N	
R10-5	N		N		N		N		N		N	



# Chapter 11

## Moderate Risk and Hazardous Waste

Moderate Risk Wastes (MRW) are hazardous materials generated by households and by businesses that produce less than 220 pounds per month of materials classified as Dangerous Wastes (DW), or 2.2 pounds per month of materials classified as Extremely Hazardous Waste. RCW 70.105.010(17) defines “Moderate-risk waste” as: (a) any waste that exhibits any of the properties of hazardous waste but is exempt from regulation under this chapter solely because the waste is generated in quantities below the threshold for regulation, and (b) any household wastes which are generated from the disposal of substances identified by the department as hazardous household substances.

This Chapter addresses:

- Household Hazardous Waste
- Used Motor Oil
- Batteries
- Electronics
- Regulated Generators, Transporters and Sites

### 11.1 Existing Conditions

#### 11.1.1 Household Hazardous Waste/ Small Quantity Generators of Hazardous Waste

Moderate Risk Waste generators producing under 220 pounds of material per month can take their materials to the Central Landfill. Businesses that generate amounts over this threshold must make other arrangements through companies such as Safety Kleen and Phillips Environmental.

##### Collection Rate

Approximately 45,000 pounds (22 tons) of moderate risk waste materials were collected from residents and small quantity generators in Okanogan County in 2009. This resulted in a collection rate average of 2.13 pounds per capita of household hazardous waste. The statewide collection average is 2.62 pounds per capita. These rates do not include used oil collection.



### Collection at the Central Landfill

Residents and businesses that are small quantity generators of MRW can drop off items for collection on Saturdays at the Central Landfill. (Small Quantity Generators by appointment). Paints, solvents, batteries, antifreeze, oil, brake fluid, cleaners, insecticides, herbicides, and swimming pool and hobby supplies are collected. The amounts of these materials collected for 2009 are shown in Table 11-1. All materials were handled by Phillips Environmental for proper treatment, recycling or disposal.

**Table 11-1. 2009 Household Hazardous Waste Collection Onsite at the Central Landfill 2009 (sent to Phillips Environmental Services)**

Type	Amount (pounds)
Antifreeze	1,450
Flammable Liquids	250
Contaminated Oil	00
Pesticide/Poison Liquid	150
Oxidizers	300
Oil Based Paint	9,650
Latex Paint	5,590

### Collection Events

Okanogan County no longer holds satellite one day collection events. Expenses and personnel required for 1 day events have become prohibitive. In addition to the central facility there is a satellite facility which is open 2 days a month at the Twisp Transfer station. All hazardous materials collected at the satellite facility are transported to the fixed facility at the central landfill for proper handling and shipment.

Okanogan County distributes promotional and educational materials on the importance of proper hazardous waste handling through the following methods:

- Providing information on their hotline.
- Mailing fliers to residents.
- Providing fliers at all transfer stations.
- Distributing handouts at an annual fair booth.
- Giving tours and offering class field trips of the Central Landfill facility.
- Advertising in the Omak Chronicle, Gazette Tribune, Quad City Herald.
- Sponsoring radio announcements on stations KOMW, FM and AM.

An Emergency Response Plan for Hazardous Material is being developed by a local committee (Local Emergency Planning Committee), which is chaired by the County Sheriff. Emergency response is also under the Homeland Security Act of 2002.

The purpose of this plan is to develop policies and procedures for responding to a spill of hazardous materials.

The plan addresses incidents involving transportation, use, and storage of hazardous materials, including waste materials. The plan provides for the coordination of local government action in response to an incident, and lays out procedures to protect emergency workers and the population at large. This is in conformance with federal statutes in the Superfund Amendments and Reauthorization Act of 1986 (SARA), and RCW 38.525.

### 11.1.2 Used Motor Oil

Residential and commercial small generator used motor oil is collected at all transfer stations and transported to the Central Landfill. All collected oil is used onsite for heating. Prior to use, oil is screened. If it is contaminated, it is barreled and sent to a licensed disposal facility. Approximately one to two barrels of oil per year are contaminated. In 2009, 3,157 gallons of used motor oil were collected by the County.

Table 11-3 summarizes the amount of oil collected from the public at each County transfer site, and the total number of gallons transported to the Central Landfill.

**Table 11-3 2009 Residential/Commercial Small Generator Used Motor Oil Collection by Okanogan County, Based on Location**

Transfer Station	Gallons of Used Motor Oil
Bridgeport Bar Transfer Station	650
Twisp Transfer Station	675
Ellisforde Transfer Station	450
Okanogan County Central Landfill	1,382
<b>TOTAL AMOUNT COLLECTED</b>	<b>3,157</b>

Service stations make their own arrangements for used oil. A quick telephone survey of service stations indicated that most used oil is sold to businesses and residents and used for heating. Services stations do not accept used oil from private individuals to avoid contamination risks.

### 11.1.3 Batteries

#### Lead Acid Batteries

Lead acid batteries are accepted for recycling by the County at the Central Landfill and through a collection program at retail stores. Batteries are not collected at transfer sites due to permit conditions.

A sample of battery retailers was polled and most reported accepting used batteries upon the purchase of new batteries. Used batteries are collected and shipped for recycling through new battery distributors.

## Household Batteries

Early in 2002, Okanogan County started a household battery collection program by partnering with businesses throughout the County to collect household batteries at no charge to residents. Seventy-five percent of this program is funded by the Department of Ecology.

Each collection point has a display and buckets for collection. Sites accept the following batteries: alkaline (AAA-D, 9-volt etc), button cell, hearing aid, calculator, watch, and rechargeable (camcorder, cell phone, and portable tool). Batteries are periodically picked up and transported to the Central Landfill to be sorted into recyclable and non-recyclable batteries for proper disposal and recycling with the National RBRC Company. In 2009, an estimated 8,200 pounds of household batteries were collected. Table 11-4 lists the number of household battery collection locations by jurisdiction within Okanogan County.

**Table 11-4. 2009 Household Battery Collection at Retail Stores**

City	Number of Store Collection Sites
Omak	2
Okanogan	2
Brewster	1
Pateros	1
Twisp	1
Oroville	1
Tonasket	2

### 11.1.4 Electronics Waste

Computer and electronics waste is a growing concern. Improper disposal can result in the release of hazardous materials such as lead and mercury into the environment, as well as waste the precious metals (gold, silver, platinum) contained in certain equipment. With the successful diversion of lead-acid batteries and tire wheel balancing weights from disposal, the main current source of lead in landfills is believed to be cathode ray tubes in televisions and computer monitors. Electronic waste can also contain mercury, primarily in the form of mercury dampened switches, but also as a chemical constituent of electronic components.

The E-Cycle Washington program was added to regulations in the year 2007 (WAC 173-325 and WAC 173-900). Opportunities to recycle electronics (TV's, computers, laptops and monitors) in Okanogan County are Green Okanogan Recycle-Tonasket and Methow Recycles-Twisp.

A group of national organizations, including the National Recycling Coalition, are currently negotiating a manufacturer's funded take-back program. The objective of these negotiations (from the local government's perspective) is to integrate the cost of eventual recovery and recycling or disposal into the purchase price of electronics, so that local governments are not required to fund additional diversion programs.

At the State level, Ecology has provided guidelines for institutions and other large generators of electronics waste that the disposal of significant numbers of computer monitors and electronics waste may easily exceed the 220 pound per month threshold of moderate risk waste. Exceeding these limits would remove a business or institution's conditionally-exempt status and require the organization to formally register as a hazardous waste generator. That organization would then be responsible for manifesting (tracking) all waste and ensuring that all hazardous waste management activities meet federal and state requirements for on-site handling, transportation and eventual recycling or disposal. The potential of shifting from a conditionally-exempt organization to a regulated hazardous waste generator has provided a strong incentive for many businesses, institutions and government agencies to ensure that their scrap electronic equipment is recycled. Unfortunately, many generators still do not know of the potential of exceeding their conditionally-exempt threshold, and inadvertently dispose of their electronic waste.

### 11.1.5 Regulated Generators and Transporters and Sites

The Resource Conservation and Recovery Act (RCRA) and the Hazardous Waste Management Act (HWMA) regulate hazardous waste. Businesses that generate, transport or own/operate a hazardous waste treatment facility have an EPA/state identification number.

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires EPA to keep a listing of hazardous waste remediation sites. These sites are illustrated in Table 11-6. Table 11-6 lists Federally-listed sites, while Table 11-7 lists state hazardous waste remediation sites.

**Table 11-6. Federally Listed Hazardous Sites in Okanogan County (EPA)**

Site Name	City
Alder Mill	Twisp
Alder Mine	Twisp
Columbia Lace	Bridgeport
KAABA Texas Mine	Nighthawk
Silver Mountain Mine	Loomis
USDOI BLM KABBA Texas Mine	Nighthawk

**Table 11-7. State Listed Hazardous Sites in Okanogan County (DOE)**

Site Name	City
Alder Mill	Twisp
Alice Mine	Nighthawk
Ardens Store	Malott
Black Bear Mine	Loomis

Brett Pit	Coulee Dam
Brooke Mine	Omak
Coca Cola Distribution	Omak
Conconully General Store	Conconully
Copper World Extension Mine	Loomis
Dales Texaco	Oroville
Four Metals Mine	Nighthawk
Havillah Rd Oil dumping	Tonasket
Jackpot Food Mart	Oroville
Kings Pacific Pride	Twisp
Leonard Judd Property	Okanogan
Lloyds Logging Equipment Yard	Twisp
Lloyds Logging Exc. Soil	Twisp
Loomis Chevron	Loomis
Minnie Mine	Carlton
Molson Dump	Molson
Montanye Property	Tonasket
Omak Gull 611	Omak
Oroville Dump	Oroville
Quick Mart	Oroville
Red Shirt Mill	Twisp
Richard Reed Property	Oroville
Ruby Mine	Nighthawk
Silver Mountain Mine	Loomis
Tonasket Post & Rail	Tonasket
US DOI BLM	Omak
Virginia Houser Property	Okanogan

### 11.1.6 Business Technical Assistance

The County currently provides a 3-part business technical assistance program. When businesses request assistance or are flagged as having unallowable MRW in their disposed wastes the County solid waste department will determine what kind and quantity of material is held by the generator. Depending on the response, the County will then provide direct suggestions on how to best handle the materials, refer them to an Ecology contact, or refer them to a professional environmental service provider.

## **11.2 Needs and Opportunities**

### **11.2.1 Moderate Risk / Hazardous Waste**

Residents and businesses may need more convenient methods to increase recovery of hazardous waste. Accessibility will promote proper disposal methods. Currently the Central Landfill only accepts materials one day a week. Accepting materials additional days of the week may increase diversion.

Education is needed to inform the public on materials considered moderate risk waste and how to properly handle them. Providing easy access listings on printed material, websites and for mailings would disseminate this information.

### **11.2.2 Used Motor Oil**

Partnering with service stations or stores to provide a countywide collection system could motivate residents and businesses to turn in oil for recycling. Public education would lessen the amount of oil used for dust control or poured down drains.

### **11.2.3 Batteries**

The infrastructure for recycling lead acid batteries appears adequate, with the exception of providing recycling opportunities at transfer stations. Lead acid batteries recycling alternatives and recommendations are discussed in Chapter 4 – Recycling.

Since its inception the household battery recycling program has been successful in removing household batteries from the waste stream. In the year 2009 8,198 pounds was collected.

### **11.2.4 Electronics Waste**

Electronics or E-waste recycling as it is called has 2 locations available to Okanogan County Residents. One in North County and one in West County. The County will need to review and consider expanding potential electronics waste locations to reduce the toxicity of landfilled wastes.

### **11.2.5 Regulated Generators and Transporters and Sites**

No needs or opportunities have been identified for regulated hazardous waste generators, transporters and sites. These parties will continue to be regulated by state and federal agencies.

### **11.2.6 Business Technical Assistance**

If the Department of Ecology no longer provides business technical assistance, the County may need to provide or ensure the availability of more extensive technical assistance services, if locally available consultants are not available.

## 11.3 Alternatives

### 11.3.1 Moderate Risk / Hazardous Waste

Alternatives for moderate risk waste generators:

- The County could make its MRW facility to the Central Landfill available more than one day a week. This may entail additional staffing costs, depending on how staff coverage is managed and how many landfill staff members have the appropriate training to accept and process MRW materials. Increased diversion would also increase recycling and disposal costs.
- The County could establish a collection system at all transfer stations. An inexpensive collection system could be developed using simple covered containers and existing staff and trucks to transport materials to the Central Landfill facility.
- The County could continue and/or expand its efforts to provide education to businesses and residents about less toxic alternatives that can be purchased to avoid generating MRW.
- The County could encourage reuse of appropriate MRW materials through the use of an exchange shelf at the MRW facility. Automotive products and many household chemicals can be reused, thus avoiding transportation and disposal charges. Both Whatcom and Island Counties use this method and include a liability release sheet to manage their reuse program.

### 11.3.2 Used Motor Oil

Alternatives for used motor oil handling include:

- Additional public education on used oil management could be used to further reduce illegal dumping and use of motor oil as dust control.
- Additional public disposal sites could be solicited by the County. For example, large auto parts retailers could be encouraged to provide small quantity motor oil recycling.
- If curbside recycling programs are implemented in the future, motor oil could be included as an accepted material. This has been the trend in many Western Washington curbside programs, since it eliminates the need for residents to bottle motor oil and transport it to a central site in their cars.

### 11.3.3 Batteries

Alternatives for proper disposal of batteries include:

- The County could expand its promotion efforts to more specifically target lead acid batteries and further educate residents and businesses on the importance of recycling, as discussed in Chapter 4 – Recycling.

- The County could work with the Health District to address concerns related to accepting lead-acid batteries at transfer stations. Transfer station permits could then be amended to allow the segregation and recycling of lead acid batteries.

### **11.3.4 Electronic Waste**

Alternative to disposing of electronics and computers include:

- Working with regional and state organizations to support retail take-back programs.
- Support reuse efforts to link residents and businesses with old computers with individuals and organizations seeking free computers.
- Investigate providing electronics recycling opportunities at the Central Landfill. The County could accept electronics for recycling (at a voluntary additional charge) and ship pallets of obsolete electronics to processors in Spokane and Seattle.

### **11.3.5 Business Technical Assistance**

Alternatives for expanded technical assistance or replacement technical assistance if Ecology services are no longer available include:

- The County could expand its solid waste staffing or provide additional training to additional staffing to handle additional technical assistance requests. This would require additional funding and, even if the program charges technical assistance fees, may be unable to be self-supporting. Providing additional Haz-Mat training to existing staff may be more cost-effective, but would require the County's investment in training as well as changing existing job responsibilities and workloads.
- The County would develop an expanded list of environmental consultants to provide fee-based technical assistance to local businesses and institutions. This would not require County funding, but would be more expensive for local generators, which would perhaps make it less likely to seek assistance unless forced to by disposal load rejection at the County's disposal facilities.

## **11.4 Recommendations**

MRW recommendations were developed by the County SWAC during a meeting in December 2010.

Recommendations, including implementation responsibilities and procedures, are discussed below. Implementation and operation timeline schedules are provided in Table 11-8. County staffing requirements are expressed in "Full Time Equivalents" (FTEs), where 0.1 FTE is equal to 180 hours of staff time per year.

**Recommendation 11-1: Continue MRW Facility at Central Landfill.** The County will continue to provide a MRW facility at the Central Landfill or successor disposal facility.

The MRW facility will be open at least one day per week and will accept materials from households and conditionally-exempt small quantity generators. The facility may be open additional days or sites each week, as staffing and funding allow. Collected materials will be reused or shipped via regulated haulers to treatment, recycling or disposal facilities.

**Recommendation II-2: MRW Promotion and Education.** The County will continue to provide MRW reduction, recycling and disposal promotion and education as part of its overall solid waste program. Promotion and education programs will be tailored to address specific topics and reminders on a rotating basis throughout the planning period. Examples of topics include MRW facility availability and acceptance policies, proper motor oil management, battery recycling, and electronics reuse and recycling.

**Recommendation II-3: MRW Reuse.** The County will investigate the legal and operational issues related to providing a reuse area at the MRW facility for appropriate materials. If feasible, the County will allow the reuse of certain MRW materials such as automotive products and household chemicals. Extremely hazardous wastes and banned materials (e.g. DDT, penta preservatives, etc.) will not be allowed for reuse and will be disposed as MRW.

**Recommendation II-4: Lead-Acid Battery Recycling.** The County will work with the jurisdictional Health District to determine the feasibility of accepting lead-acid batteries at transfer stations. If feasible, the County will accept lead-acid batteries at transfer stations.

**Recommendation II-5: Electronics Recycling.** The County will investigate the feasibility of accepting electronic equipment for recycling material at the Central Landfill. If feasible, a fee would be charged to cover the costs of recycling the components.

**Recommendation II-6: Business Technical Assistance.** In the event that Ecology business technical assistance programs are no longer available to Okanogan County generators, the County will solicit and compile a list of environmental consultants to provide those services to generators.

**Table 11-8. Implementation and Operation Timeline**

RECOMMENDATION	2011	2012	2013	2014	2015	2016
R11-1 CONTINUE MRW FACILITY	[Shaded bar]					
R11-2 MRW PROMOTION/EDUCATION	[Shaded bar]					
R11-3 MRW REUSE	[Shaded bar]					
R11-4 LEAD-ACID BATTERY	[Shaded bar]					
R11-5 ELECTRONICS	[Shaded bar]					

**Cost (Staff Hours/Cost in Dollars)**

RECOMMENDATION	2011		2012		2013		2014		2015		2016	
	STAFF	COST										
R11-1	340	59,700	340	60,000	340	60,000	340	60,000	340	60,000	340	60,000
R11-2	24	3,000	24	3,000	24	3,000	24	3,000	24	3,000	24	3,000
R11-3	25	530	N		N		N		N		N	
R11-4	N		N		N		N		N		N	
R11-5	N		N		N		N		N		N	
R11-6	N		N		N		N		N		N	

N - Negligible



Chapter  
**12**

**Administration  
and  
Enforcement**

This chapter reviews the administrative and enforcement mechanisms and jurisdictional responsibilities for solid waste management in Okanogan County. County ordinances and resolutions related to solid waste are provided in Appendix G.

## **12.1 Existing Conditions**

### **12.1.1 Jurisdictional Roles and Responsibilities**

#### Cities

Cities in Okanogan County administer their solid waste programs by ordinances and, in some cases, contracts with garbage haulers or municipal collection. Only one city within the Planning Area, Oroville, currently provides municipal collection. In most Okanogan County cities, municipal ordinances and contracts regulate the operation of private collection systems, including service charges (rates), frequency of service and billing, record keeping, and procedures for recovering delinquent charges. Some cities defer to WUTC-certificated haulers and have little role in specifying services or rates. In Okanogan County, some city-contracted collection companies provide their own direct billing services, while others rely on municipal billing.

The County and cities also have litter control and illegal dumping clean-up programs within their respective jurisdictions, although these activities are often informal and generally performed by public works or parks crews as needed.

#### Colville Confederated Tribes

The Colville Confederated Tribes maintains jurisdiction over all its lands for all solid waste function, including collection, transfer, disposal and enforcement. The Tribes operates its own transfer stations and currently directs all MSW to the County landfill, although it has also considered developing a landfill on Tribal land. There is currently no interlocal agreement between the Colville Confederated Tribes and the County.

#### Washington State Department of Ecology (Ecology)

Ecology is charged with promulgating and enforcing State regulations for solid waste disposal, air emissions, and wastewater and leachate discharges. The State solid waste regulations that Ecology enforces result from State legislation (RCW 70.95) and in response to Federal law such as the Resource Conservation and Recovery Act (RCRA).

Ecology reviews and approves local solid waste management plans, works with local health departments to enforce the State's Minimum Functional Standards (WAC 173-304, to be superseded by WAC 173-350 and WAC 173-351), and regulates biosolids handling. Ecology may periodically revise facility standards (e.g. WAC 173-351) for demolition landfills, compost facilities, and moderate risk waste facilities, as part of code revisions.

Ecology also has regional responsibility for regulating and enforcing air quality in the absence of local air pollution control authorities. Solid waste management activities that impact air quality fall under Ecology's jurisdiction.

### Washington Utilities and Transportation Commission (WUTC)

The WUTC regulates private garbage and refuse collection companies that operate throughout Okanogan County. Cities with municipally-operated or contracted collection services are not subject to WUTC regulation. The Commission regulates collection fees and operating standards, as well as requiring annual revenue and expense reports for certificated collection companies. (See Chapter 7 – Collection for an additional description of regulatory authorities.)

If curbside recycling were desired within a WUTC-certificated collection area in Okanogan County, the respective jurisdiction would need to enact a service level ordinance directing the hauler to add the service and incorporate the costs in rates proposed to the WUTC. In Okanogan County, the County and cities have not previously enacted service level ordinances to direct the activities of certificated haulers, in part due to the absence of curbside recycling in any certificated collection area. If a service level ordinance were enacted, the WUTC would then be responsible for regulating the certificated haulers' services within the framework of the city or County's service level ordinance.

The WUTC also reviews the County's Comprehensive Solid Waste Management Plan during the approval process and evaluates the probable financial impacts to County rate-payers through the cost assessment (Appendix H).

### Okanogan County Health District

The Okanogan County Health District is a cooperative local agency governed by a board composed of the three County Commissioners and three City representatives (typically mayors or their designees). The Health District is charged with local enforcement of Minimum Functional Standards and Moderate Risk Waste regulations and ordinances. The Health District is responsible for permitting all local disposal and drop-box facilities for solid waste.

The Health District also responds to complaints of illegal dumping, burying, and accumulations of waste on private property. The Health District has traditionally used an educational approach over a more punitive enforcement approach to illegal burying and accumulations of waste on private property. When necessary in special cases, the Health District will resort to civil or criminal penalties. The Health District also works with Public Works and local law enforcement agencies to respond to and control illegal dumping activities.

During 2008 and 2009, the Health District responded to about 100 solid waste complaints per year. Complaints were related to litter, illegal disposal of demolition waste, wood waste, and chemicals.

### Okanogan County Solid Waste Advisory Committee (SWAC)

The Okanogan County SWAC was established to provide stakeholder comment and advice on the planning, administration, and management of solid waste within the County. The SWAC holds periodic meetings (usually monthly) to discuss County policies and ordinances, and other issues related to local solid waste management.

SWAC meetings are open to the public and memorialized with written minutes. Drafts of documents and meeting minutes are sent to the mayors of the cities, affected agencies and organizations, and to interested individuals.

### Okanogan County Public Works

Solid waste functions are performed through Okanogan County's Public Works Department. The Department is responsible for administering the County's solid waste management program.

Department staff administrative activities include:

- Operating the Central Landfill and managing the County's three transfer stations (two of which are operated by County staff and one of which is privately contracted).
- Establishing solid waste funding mechanisms.
- Collecting fees and budgeting expenses.
- Managing post-closure activities at former landfills.
- Implementing, monitoring, and evaluating waste prevention, recycling, collection, disposal, and other components of the County's waste management system.
- Implementing Moderate Risk Waste program.
- Solid and hazardous waste management planning.

In Okanogan County, solid waste management planning is performed comprehensively by the County. Cities within the Planning Area participate in a review and approval process of the County Plan instead of submitting individual plans for inclusion. The development of the County Plan is performed by the Department, with input from the County SWAC and cities.

The Public Works Department, the County Health District, and the County Sheriff's Department cooperate to perform litter and illegal dumping control activities throughout the County. The State provides litter pickup along State highways.

Department staff also provides enforcement and control over the disposal of moderate risk wastes. Enforcement typically happens at the scale house with inquiry, visual

check and random inspections of both private and commercial loads. Inspection also occurs when transfer containers are being packed and dumped at the working face of the Central Landfill. Depending on the situation when MRW is discovered, the product is returned to the generator or is removed from the disposal stream and properly handled as MRW. Whenever possible, or if able to identify, the generator who improperly disposed of MRW is charged disposal and labor costs for special handling.

### **12.1.2 Solid Waste System Financing**

The County's solid waste system is funded almost entirely through tipping fees at transfer stations and the Central Landfill. The current 2010 municipal solid waste tipping fee is \$74 per ton, with higher charges in effect for medical waste, asbestos, and other materials. In 2009, tipping fees comprised \$2.20 million of the total \$2.41 million revenues. Ecology grants (CPG and others), investment interest, and revenue from the sale of recyclables accounted for the difference.

Solid waste tipping fees are used for essentially all solid waste related expenses, including transfer operations, landfill disposal, construction debt service, post closure fund contributions, recycling, moderate risk waste, public education, and administration. Ecology grants have been used for planning, recycling, and other programs, with the County's match obtained from disposal tipping fees.

Solid waste revenues and expenses are well balanced at this time. Disposal tipping fees have been stable for several years, with no increases since 1995. No tipping fee increases are expected during the next two years. Construction bonds for the Central Landfill will be retired in 2012, which will reduce approximately \$280,000 per year that the County currently expends on debt service. The \$537,000 level of annual contribution to the Central Landfill post-closure fund is not expected to change significantly during the next few years.

In 2002, the County instituted new budget tracking methods to better allocate costs among the various components of the solid waste system. Once better data is available the County will be able to better identify transfer, disposal, and recycling costs by location. This will allow the County to better evaluate its future options for managing the system.

Known capital funding needs during the planning period and the following year ("6 year") and a longer 20-year time horizon are listed in Appendix I. The short term funding needs will be funded out of existing tipping fee and grant revenues. The specific small capital improvements priorities are re-evaluated yearly during the County's budget process and are implemented as funding allows. Longer range projects, such as relocating transfer stations or obtaining additional disposal capacity are funded through a combination of reserves, grants and current tipping fee revenues.

## **12.2 Needs and Opportunities**

Many of the components of the County's solid waste management system have been developed during the past 10 years and have reached a level of stability, after initial adjustments. Needs and opportunities are presented for jurisdictions (local governments and regional and state agencies) and financing issues relating to the County's solid waste management system.

## 12.2.1 Jurisdictional Needs and Opportunities

### Cities

Cities will need to continue to develop and refine their municipal garbage collection systems. Rate structures and collection services will need to be continually monitored and modified as necessary to incorporate waste reduction incentives and maintain consistency with the County transfer and disposal system. Alternatives and recommendations for municipal collection charges and rate structures are discussed in Chapter 4 – Recycling and Chapter 7 – Collection.

As solid waste law and contract administration become more complex, many smaller cities will have difficulty retaining trained staff capable of addressing the more technical aspects of solid waste issues. For example, negotiating and administering annexation agreements with certificated haulers may require specific experience not necessarily available to public works staff assigned to solid waste as one of many job tasks.

### Ecology

Ecology will need to continue its solid waste review and approval activities, as well as administering air quality, hazardous waste, and biosolids management regulation and enforcement. The ability of Ecology to manage these responsibilities depends on its regional level of funding, which is dependent on the Legislature.

### WUTC

The WUTC will need to continue its regulation of certificated haulers under the authority of RCW 81.77. If the Legislature shifts or eliminates the WUTC's system of G-certificates, local government may need to be more active in managing the garbage collection system under contracts or franchises.

### Okanogan County Health District

The Department will need to continue providing local enforcement of Minimum Functional Standards, both for closed landfills and currently operating facilities. The District will also need to continue to educate residents and provide enforcement against illegal disposal and accumulations of material that pose a threat to public safety. Additional activities to educate residents to reduce littering are also needed.

The County Public Works Department will need to work with the Health Department to revise County Code to clarify authorities and penalties, and to coordinate enforcement efforts for illegal disposal and unsafe accumulations of solid waste.

### Okanogan County SWAC

The County's SWAC will need to continue its advisory role in the management of County and city solid waste activities, including a periodic review of this Plan, once adopted. The periodic review will need to include periodically reviewing the County's recycling potential assessment as described in Chapter 4 – Recycling.

In the event that an alternative disposal system such as waste export is proposed, the SWAC will need to assist with reviewing the feasibility and provide a recommendation to the County Commissioners.

### Okanogan County Department of Public Works

The Department will need to continue existing solid waste management activities, including disposal and transfer site operation, waste prevention and recycling programs, Moderate Risk Waste management, post-closure monitoring of closed landfills, and other related activities.

## 12.2.2 Solid Waste System Financing

The County will need to continue to ensure that solid waste revenues cover the costs of operating the solid waste system. Disposal tipping fees have historically been a stable revenue base, although tipping fee-financed disposal systems can be open to competition from neighboring jurisdictions, particularly when competing private operations without similar system-wide costs (e.g. recycling, moderate risk waste, transfer) can offer disposal at a lower price than the local system.

Funding alternatives may be required to maintain the system if competition diverts waste flow away from the County system. The County would not necessarily be able to raise tipping fees to cover revenue lost to competing disposal operators, since higher tipping fees would likely drive additional flow to those competitors. Thus, the County may need to consider funding contingencies in the event that tipping fees cannot be adjusted to meet fixed system expenses.

## 12.3 Alternatives

### 12.3.1 Jurisdictional Alternatives

#### Cities

Alternatives for City management of the solid waste system include:

- Continuing the status-quo where each city assigns staff to manage the City's solid waste program, including collection contract or program administration, education and promotion, and illegal disposal and mandatory collection enforcement (if enacted).
- Combine programs with shared management, perhaps with a shared solid waste manager allocated among participating cities.
- Continue status-quo, with additional support from the County, possibly in the form of technical assistance or workshops for municipal staff on specific issues of concern.

#### Ecology

Under current state law, there are no alternatives to Ecology's enforcement of biosolids and air quality programs. If statutory authorities change in the future to reduce

Ecology's regulatory mandate, the County, Health District, or cities would need to develop regulatory programs for these functions.

### WUTC

Under current State law and regulation, there is no alternative to current regulatory roles and responsibilities. If statutory authorities change in the future to reduce the WUTC's regulatory mandate, the County or cities would need to provide economic and operational regulation of certificated haulers.

### Okanogan County Health District

The Health District administers solid waste regulation under the Minimum Functional Standards as well as local code. These regulatory activities will continue through the planning period. No alternatives have been investigated for the local regulation of these functions.

### Okanogan County Department of Public Works

The Department is charged with managing the County's solid waste system for both the cities (via interlocal agreement) and the unincorporated areas. As lead agency for solid waste, the County will continue to manage the system components on behalf of the entire planning area. These components include managing the transfer and disposal system, as well as waste reduction, recycling, and moderate risk waste programs.

If a future decision is made to shift to a waste export-based disposal system, the County could structure that system in a variety of ways, ranging from a completely public system to a completely contracted system. In either case (or in the event of a combination of approaches), the County's role in planning and managing the various components of the solid waste system would continue.

## 12.3.2 Solid Waste System Financing Alternatives

There are four alternatives for funding the solid waste system (excluding grants):

- The County could continue to rely on disposal tipping fees in order to fund the capital and operating costs of the solid waste system. Disposal fees would be periodically adjusted to ensure that revenues and expenses are evenly matched. Fees may vary as old debt is retired and new debt is retained for future expansion, and as operating costs vary with fluctuations in waste flows and program expenses. Fees would continue to be stabilized to the extent possible, in order to minimize tipping fee changes.
- The County could reduce tipping fees to cover only operating costs and fund-fixed capital costs from property tax or other revenues. This would probably reduce informal waste export and may increase landfill tonnages and net revenues. However, the County has limited tax revenues and competition from other needs limit the feasibility of this option.
- The County could exercise its authority under RCW 36.58.100 to establishing a solid waste disposal district encompassing Planning Area cities and unincorporated areas. Cities would need to adopt resolutions to

be in the district. If enacted, the disposal district would be a quasi-municipal corporation with taxing authority. The district would be authorized to assess a levy on property parcels or solid waste collection in order to fund disposal district activities. Eligible functions include essentially all of the functions currently performed by the County. A disposal district would have the advantage of raising a portion of solid waste funds from a parcel or collection services tax, and reducing its reliance on disposal tipping fees. Although this statutory authority has been in place for 30 years, only one or two Washington State counties have elected to form disposal districts, due to the acceptability of tipping fees and the rarity of fully privatized disposal systems that require alternative funding for county administrative activities.

- The County could exercise its authority under RCW 36.58A to form a solid waste collection district. If enacted, the collection district would require mandatory collection within its boundaries and provide for penalties for non-compliance. The collection district essentially gives counties the ability to invoke mandatory collection in a manner similarly available to cities under municipal ordinance. A collection district is a necessary adjunct to a disposal district if the disposal district depends on a collection fee tax collected by certificated haulers. In the absence of mandatory collection, the customer base of certificated haulers in unincorporated areas might be reduced due to the effective service cost increase due to the disposal district tax. Even under a collection district, enforcement can be problematic when residents refuse to pay for unwanted collection services.

## 12.4 Recommendations

Recommendations for solid waste administration and enforcement were developed by the County SWAC during a meeting in December 2010.

Recommendations, including implementation responsibilities and procedures, are discussed below. Implementation and operation timeline schedules are provided in Table 12-1. County staffing requirements are expressed in “Full Time Equivalents” (FTEs), where 0.1 FTE is equal to 180 hours of staff time per year.

### 12.4.1 Jurisdictional Recommendations

**Recommendation 12-1: Cities Participation.** The Cities within the Planning Area—Brewster, Conconully, Okanogan, Omak, Oroville, Pateros, Riverside, Tonasket, Twisp, and Winthrop—will continue to be part of the Okanogan County solid waste management system and will maintain compliance with the provisions of interlocal agreements.

**Recommendation 12-2: City Management.** Cities will continue to manage their solid waste collection programs and municipal ordinances. The County may provide technical assistance workshops to member cities as interest, staff time, and funding allow.

**Recommendation 12-3: The Okanogan County Health District’s Role.** The County Health District’s Environmental Health Division will continue to enforce solid waste handling practices throughout the County. These activities include monitoring and

permitting solid waste facilities and transfer stations. When local concerns dictate, the Health Department will adopt local regulations for solid waste management facilities.

**Recommendation 12-4: The Okanogan County Solid Waste Advisory Committee's Role.** The Okanogan County Solid Waste Advisory Committee will continue to review and provide comment on County policies and programs related to solid waste management, including reviewing periodic recycling potential assessments, disposal option planning and a periodic review of this Plan. County staff will provide support to the SWAC, as appropriate.

**Recommendation 12-5: Public Works Department Coordination and Management.** The County Public Works Department will continue to provide coordination and management of the County solid waste management system. These activities include post-closure monitoring at former landfills, operation of transfer sites and central disposal site, the implementation of County ordinances (including Collection and Disposal Districts, if enacted), waste prevention and recycling programs, and moderate risk waste programs.

#### **12.4.2 Okanogan County Solid Waste System Financing Recommendations**

**Recommendation 12-6: System Funding.** The County will continue to use disposal tipping fees to fund the solid waste system to the extent practical. The County will consider and implement Disposal and Collection Districts or other funding mechanisms if future events result in a need to reduce tipping fees and recapture lost revenue through direct taxation of parcels or collection services.

**Table 12-1. Implementation and Operation Timeline**

RECOMMENDATION	2011	2012	2013	2014	2015	2016
R12-1 CITIES PARTICIPATION	[Shaded]					
R-12-2 CITY MANAGEMENT	[Shaded]					
R12-3 HEALTH DISTRICT	[Shaded]					
R12-4 SWAC ROLE	[Shaded]					
R12-5 PUBLIC WORKS MANAGEMENT	[Shaded]					
R12-6 SYSTEM FUNDING	[Shaded]					

**Cost (Staff Hours/Cost in Dollars)**

RECOMMENDATION	2011		2012		2013		2014		2015		2016	
	STAFF	COST										
R12-1	N		N		N		N		N		N	
R12-2	N		N		N		N		N		N	
R12-3	N		N		N		N		N		N	
R12-4	N		N		N		N		N		N	
R12-5	25	750	25	750	25	750	25	750	25	750	25	750
R12-6	N		N		N		N		N		N	

**Appendices:**

- A. Interlocal Agreements**
- B. Public Participation Plan**
- C. Draft Plan Comments and Responses**
- D. SEPA Checklist**
- E. 2011 Okanogan Waste Composition**
- F. Solid Waste Ordinances/ Resolutions**
- G. WUTC Cost Assessment**
- H. 6/20 Year Capital Improvements**



## **A. Interlocal Agreements**



## **B. Public Participation Plan**



## **1. Pre-Planning Stakeholder Consultation**

At the start of the Comprehensive Solid Waste Management Plan (CSWMP development process), S.W.A.C. will contact all cities, affected tribes, haulers and other relevant parties to identify major issues and topics to be addressed through the planning process.

The results of this step will be reviewed with the SWAC and used by the SWAC and the County to scope the major issues requiring resolution through the plan. The stakeholder consultation will also be used to determine the relative emphasis of various topics covered in the new CSWMP.

This was conducted from November, 2009 to July, 2011 with the results sent to the cities on August 5, 2011.

## **2. SWAC Chapter Review**

Chapters of the CSWMP will be sequentially rewritten to reflect updates and the major policy decisions identified through stakeholder consultation. As each chapter is re-written, it will be reviewed by the SWAC in sequential order. The SWAC will discuss needs and opportunities, alternatives and assist in developing recommendations for each chapter. Selected chapters will be reviewed with specific stakeholder groups to confirm factual details as well as identification of major issues and alternatives (e.g. private and municipal garbage haulers reviewing the Collection chapter).

After SWAC and stakeholder review, each chapter will be completed and compiled into the Preliminary Draft CSWMP. The chapter-by-chapter review of the plan began after November 12, 2009.

## **3. Interim Draft Distribution to Cities**

Copies of the Preliminary Draft CSWMP plan will be distributed to all cities and tribes for internal review by city staff and council members. This review process will be used to confirm consensus on CSWMP content and direction. If major areas of conflict are identified at this stage, the CSWMP will be re-reviewed with SWAC to determine which changes will be necessary to achieve consensus on the plan.

County or consultant staff will be available to present the CSWMP to city councils on request. City staff and elected officials will also be extended the opportunity to comment on chapters earlier, as they are reviewed by SWAC, and encouraged to attend SWAC meetings where chapters of particular interest are reviewed.

This process of mailed out Preliminary Drafts occurred in August 5, 2011.

#### **4. Public Review and Availability of Draft Plan**

The Public Review Draft CSWMP including the SEPA checklist was published in October 2011. Copies will be distributed to each City Hall and library in the County. Multiple copies will be provided to larger cities to ensure adequate availability for public review. A copy will also be provided to the Department of Ecology and the WUTC for informal review.

Approximately three weeks after the Draft CSWMP has been released, a public hearing on November 1<sup>st</sup> will be held to help to gather public input to the draft. The initial plan will be to hold a single public hearing in the Okanogan County Commissioner's office.

The hearing was structured to include a presentation on CSWMP goals and objectives as well as highlighting plan recommendations, in cases where those recommendations are different than the status-quo solid waste management system. Public Hearing participation will be encouraged to provide either verbal comments at the hearing or written comments within a specified comment period.

A responsiveness summary of all comments and County responses has been included as Appendix C.

#### **5. Formal Hearing Process**

Each city council will likely handle the CSWMP adoption process differently. However, each city will need to pass a resolution of adoption as well as provide formal approval of an interlocal agreement with the County for the solid waste system. These activities may need to occur concurrently. Regardless, each city will use its council process to receive public comment on the plan. This public comment opportunity can either occur through a formal public hearing at each city or through the regular public comment period at the time the resolutions or ordinances are adopted by councils.

## **C. Draft Plan Comments and Responses**



## D. SEPA Checklist



## WAC 197-11-960 Environmental checklist.

### ENVIRONMENTAL CHECKLIST

#### *Purpose of checklist:*

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

#### *Instructions for applicants:*

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

#### *Use of checklist for nonproject proposals:*

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

#### A. BACKGROUND

1. Name of proposed project, if applicable:

**2011 Okanogan County Comprehensive Solid Waste Management Plan**

2. Name of applicant: **Okanogan County Department of Public Works**

3. Address and phone number of applicant and contact person:

**Sue Christopher  
1234-A 2<sup>nd</sup> Avenue South  
Okanogan, WA 98840  
509-422-2602**

4. Date checklist prepared: **May 2011**

5. Agency requesting checklist: **Okanogan County Department of Public Works**

6. Proposed timing or schedule (including phasing, if applicable):

**The 2011 Comprehensive Solid Waste Management Plan is intended to be for the 2011 – 2016 six-year period, assuming adoption and approval in mid-2011.**

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

**The Plan will be reviewed in approximately 5 years, pursuant to RCW 70.95.**

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

**Facility-specific SEPA checklists were prepared and reviewed for each of the existing facilities identified in the Plan.**

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

**No.**

10. List any government approvals or permits that will be needed for your proposal, if known.

**The facilities described in the Plan require various permits for operation. Permitting agencies include local land use departments, the Okanogan County Health District, the Washington State Department of Ecology, and (in the case of certificated garbage collection) the Washington State Utilities and Transportation Commission.**

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

**Okanogan County's 2011 Draft Comprehensive Solid Waste Management Plan (CSWMP) supersedes the County's previous 2005 CSWMP. The 2011 CSWMP was developed to fulfill the requirements of RCW 70.95, which requires local planning jurisdictions (generally counties) to prepare a solid waste management plan and to review and revise that plan every five years.**

**The County's 2011 Draft CSWMP generally recommends the continuation of the existing waste reduction, recycling, solid waste collection, transfer and disposal operation. No new facilities or major programs are recommended in the initial years of the Plan. Future decisions on transfer station numbers and locations, as well as disposal alternatives, may require additional review (including SEPA review), if and when facility-specific changes are contemplated.**

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

**The CSWMP applies to the entire County, with the exception of Elmer City and Coulee Dam, which have elected to participate in the Grant County solid waste management system. The Colville Indian Reservation is generally within the planning area, since solid waste from that region is currently directed to County facilities.**

TO BE COMPLETED BY APPLICANT

EVALUATION FOR  
AGENCY USE ONLY

**B. ENVIRONMENTAL ELEMENTS**

**1. Earth**

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other . . . . .

**Does not apply.**

b. What is the steepest slope on the site (approximate percent slope)?

**Does not apply.**

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

**Does not apply.**

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

**Does not apply.**

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

**Does not apply.**

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

**Does not apply.**

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

**Does not apply.**

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

**Does not apply.**

a. **Air**

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

**Not directly applicable. The plan seeks to address illegal burning and if programs and policies are successful, air emissions would be reduced.**

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

**Does not apply.**

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

**The administration and enforcement elements of the CSWMP seek to reduce illegal or improper burning of solid wastes.**

3. **Water**

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

**Does not apply.**

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

**Does not apply.**

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

**Does not apply.**

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

**Does not apply.**

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

**Does not apply.**

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

**Does not apply.**

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

**Does not apply.**

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

**Does not apply.**

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

**Does not apply.**

2) Could waste materials enter ground or surface waters? If so, generally describe.

**Does not apply.**

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

**Does not apply.**

4. **Plants**

a. Check or circle types of vegetation found on the site: **Does not apply.**

- \_\_\_\_\_ deciduous tree: alder, maple, aspen, other
- \_\_\_\_\_ evergreen tree: fir, cedar, pine, other
- \_\_\_\_\_ shrubs
- \_\_\_\_\_ grass
- \_\_\_\_\_ pasture
- \_\_\_\_\_ crop or grain
- \_\_\_\_\_ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- \_\_\_\_\_ water plants: water lily, eelgrass, milfoil, other
- \_\_\_\_\_ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

**Does not apply.**

c. List threatened or endangered species known to be on or near the site.

**Does not apply.**

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

**Does not apply.**

5. **Animals**

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

- birds: hawk, heron, eagle, songbirds, other:
- mammals: deer, bear, elk, beaver, other:
- fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

**Does not apply.**

c. Is the site part of a migration route? If so, explain.

**Does not apply.**

d. Proposed measures to preserve or enhance wildlife, if any:

**Does not apply.**

## 6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

**Not Directly Applicable. Existing solid waste management activities require energy inputs including diesel for collection vehicles and mobile equipment at transfer stations and the Central Landfill. These inputs may be minimized insofar as the CSWMP is successful in encouraging waste reduction.**

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

**Does not apply.**

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

**Does not apply.**

## 7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

**Not Directly Applicable. This Plan seeks to reduce environmental health hazards through proper management activities for solid wastes, moderate risk wastes and infectious wastes.**

1) Describe special emergency services that might be required.

**Does not apply.**

2) Proposed measures to reduce or control environmental health hazards, if any:

**Does not apply.**

## b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

**Existing solid waste management activities produce noise from collection vehicles, traffic and mobile equipment at transfer stations and the Central Landfill. These impacts are not expected to greatly increase or decrease as a result of the CSWMP recommendations.**

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

**Site-specific impacts have been (and will be in the future) addressed as part of facility permitting.**

3) Proposed measures to reduce or control noise impacts, if any:

**Does not apply.**

#### 8. Land and shoreline use

a. What is the current use of the site and adjacent properties?

**Does not apply.**

b. Has the site been used for agriculture? If so, describe.

**Does not apply.**

c. Describe any structures on the site.

**Does not apply.**

d. Will any structures be demolished? If so, what?

**Does not apply.**

e. What is the current zoning classification of the site?

**Does not apply.**

f. What is the current comprehensive plan designation of the site?

**Does not apply.**

g. If applicable, what is the current shoreline master program designation of the site?

**Does not apply.**

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

**Does not apply.**

i. Approximately how many people would reside or work in the completed project?

**Does not apply.**

j. Approximately how many people would the completed project displace?

**Does not apply.**

k. Proposed measures to avoid or reduce displacement impacts, if any:

**Does not apply.**

Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

**Does not apply.**

**9. Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

**Does not apply.**

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

**Does not apply.**

c. Proposed measures to reduce or control housing impacts, if any:

**Does not apply.**

**10. Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

**Does not apply.**

b. What views in the immediate vicinity would be altered or obstructed?

**Does not apply.**

c. Proposed measures to reduce or control aesthetic impacts, if any:

**Does not apply.**

**11. Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

**Does not apply.**

b. Could light or glare from the finished project be a safety hazard or interfere with views?

**Does not apply.**

c. What existing off-site sources of light or glare may affect your proposal?

**Does not apply.**

d. Proposed measures to reduce or control light and glare impacts, if any:

**Does not apply.**

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

**Does not apply.**

b. Would the proposed project displace any existing recreational uses? If so, describe.

**Does not apply.**

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

**Does not apply.**

13. **Historic and cultural preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

**Does not apply.**

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

**Does not apply.**

c. Proposed measures to reduce or control impacts, if any:

**Does not apply.**

14. **Transportation**

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

**Not Directly Applicable.**

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

**Does not apply.**

c. How many parking spaces would the completed project have? How many would the project eliminate?

**Does not apply.**

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

**Does not apply.**

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

**Does not apply.**

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

**Does not apply.**

g. Proposed measures to reduce or control transportation impacts, if any:

**Does not apply.**

**15. Public services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

**Does not apply.**

b. Proposed measures to reduce or control direct impacts on public services, if any.

**Does not apply.**

**16. Utilities**

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

**Does not apply.**

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

**Does not apply.**

**C. SIGNATURE**

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....

Date Submitted: .....

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

(do not use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

**The CSWMP generally seeks to implement programs consistent with the State's waste management hierarchy of waste reduction, recycling, recovery and landfilling. Reducing, recycling and recovering wastes reduces the disposal impacts of handling those materials through landfilling. Thus, the full implementation of the CSWMP should decrease discharges to water; emissions to air; the production, storage or release of toxic or hazardous substances; and the production of noise.**

Proposed measures to avoid or reduce such increases are:

**No increases are expected.**

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

**No impacts are expected.**

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

**Additional waste reduction and recycling will conserve energy and natural resources.**

Proposed measures to protect or conserve energy and natural resources are:

**All waste reduction and recycling recommendations. (CSWMP Chapters 3 and 4, respectively).**

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

**No impacts are expected.**

Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

**No impacts are expected.**

Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

**No impacts are expected.**

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

**No conflicts are expected.**

## **E. 2011 Okanogan Waste Composition**







## **F. Solid Waste Ordinances/Resolutions**



## G. WUTC Cost Assessment



# OKANOGAN COUNTY COST ASSESSMENT QUESTIONNAIRE

**DATE: September 15, 2011**

## **DEFINITIONS**

Throughout this document:

YR.1 shall refer to calendar year 2009.

YR.3 shall refer to calendar year 2011.

YR.6 shall refer to calendar year 2014.

## **1. DEMOGRAPHICS**

### **1.1 Population**

1.1.1 Total population of Okanogan County:

YR.1 40,500 YR.3 43,184 YR.6 44,520

1.1.2 **Planning level population** (Excluding the Towns of Coulee Dam and Elmer City which for geographic location reasons participate in Grant County's solid waste system, but including an equal number of persons to reflect seasonal influxes of tourists and workers.)

YR.1 39,800 YR.3 43,184 YR.6 44,520

### **1.2 References and Assumptions**

Total population estimates from Table 2-1. 20 Year Population, Waste Generation and Disposal Projections, Okanogan County Solid Waste Advisory Committee (SWAC) *Draft Okanogan County Comprehensive Solid Waste Management Plan (CSWMP)*, November 2010, page 2-8. The source for the population estimates for 2009 in Table 2-1 was *2009 Population Trends for Washington State*, Washington Office of Financial Management (OFM), Olympia, WA, June 2009. This OFM source also was the basis for the projections for 2011 and 2014.

Area under Okanogan County's jurisdiction and covered by the CSWMP excludes the Towns of Coulee Dam and Elmer City, which have elected to use Grant County facilities due to geographic constraints, and the Colville Confederated Tribes (the Tribes), which maintain jurisdiction over waste

management regulations, practices and financing within the Colville Reservation boundaries. However, the Tribes do participate in the planning process through membership on the SWAC, and the Okanogan County portion of the Colville Reservation uses the County's Central Landfill.

Coulee Dam and Elmer City have relatively low populations, 1044 for Coulee Dam's portion that lies in Okanogan County and 267 for Elmer City in 2009. The seasonal influx of tourists and workers likely compensates for the exclusion of these two cities in terms of population and the resultant solid waste generation. Thus, for purposes of solid waste management planning the CSWMP used total county population as the basis for forecasting waste generation.

## **2. WASTE STREAM GENERATION**

### **2.1 Tonnage Recycled**

2.1.1 YR.1 1,231 YR.3 1,306 YR.6 1,470

### **2.2 Tonnage Disposed**

2.2.1 YR.1 28,546 YR.3 30,438 YR.6 31,379

### **2.3 References and Assumptions**

Total generation, recycling and disposal tonnage data and projections for 2009-2028 provided in Table 2-4 of the Draft CSWMP, op. cit., page 2-6. Generation projections based on per capita generation rate of 0.65 tons per person for 2009. Recycling projections based on increased recycling tonnage at rate of 3% per year, as described in the Draft CSWMP on page 2-7.

**3. SYSTEM COMPONENT COSTS:** This section asks questions specifically related to the types of programs currently in use and those recommended to be started. For each component (i.e., waste reduction, landfill, composting, etc.) please describe the anticipated costs of the program(s), the assumptions used in estimating the costs and the funding mechanisms to be used to pay for it. The heart of deriving a rate impact is to know what programs will be passed through to the collection rates, as opposed to being paid for through grants, bonds, taxes and the like.

### **3.1 Waste Reduction Programs**

3.1.1 Solid waste prevention programs which have been implemented and those which are proposed are listed below, along with the page number in the Draft CSWMP where each is described.

	<u>IMPLEMENTED</u>	<u>PROPOSED</u>
3-5)	County Fair Booth (p. 3-1)	R3-1: Annual Workplan (p.
3-5)	Printed Materials (p. 3-1)	R3-2: Waste Monitoring (p.
	Web Access	R3-3: Master
	Composter/Recycler (p. 3-6)	
	R3-4: Financial Incentives (p. 3-6)	

3.1.2 Costs, including capital costs and operating costs, for waste reduction/prevention programs implemented and proposed:

IMPLEMENTED

YR.1 \$2,000      YR.3 \$2,000      YR.6 \$2,000

PROPOSED

YR.1 \$0      YR.3 \$6,600      YR.6 \$5,600

3.1.3 Funding mechanism(s) that will pay the cost of the programs in 3.1.2. (Note: Tip = landfill and transfer station tipping fees; CPG = Department of Ecology Coordinated Prevention Grants.)

IMPLEMENTED

YR.1 Tip, CPG      YR.3 Tip, CPG      YR.6 Tip, CPG

PROPOSED

YR.1 Tip, CPG      YR.3 Tip, CPG      YR.6 Tip, CPG

**3.2 Recycling Programs**

3.2.1 Proposed or implemented recycling program(s), their costs, and proposed funding mechanisms, including page number in the Draft CSWMP where each program is described, are listed below. (Note: Tip = landfill and transfer station tipping fees, CPG = Department of Ecology Coordinated Prevention Grants, Sales = revenue from selling recycled materials.)

<u>PROPOSED</u> PROGRAM	COST	FUNDING
R4-1: Recycling Potential Assessment (p. 4-14)	YR.1- \$0 YR.3 - \$0 YR.6 - \$5,500	Tip
R4-2: Additional Recycling Sites (p. 4-14)	YR.1- \$0 YR.3- \$3,000 YR.6- \$6,000	Tip Tip Tip
 PROGRAM	 COST	 FUNDING
R4-3: Source separated co-mingled Recycling (p. 4-14)	YR.1- \$0 YR.3 - \$3,000 YR.6 - \$3000	Tip Tip
R4-4: Construction/Demolition Materials (p. 4-14)	YR.1 -\$0 YR.3 -\$150 YR.6 -\$150	Tip Tip
R4-5: E-Waste (p. 4-14)	YR.1 \$0 YR.3 \$1250 YR.6 \$1875	Tip
R4-6: Commercial Recycling (p. 4-14)	YR.1 \$0 YR.3 \$0 YR.6 \$0	
R4-7: Recycling Funding (p. 4-14) costs for landfill  total cost  Sales offsets).  reduction programs.	YR.1 ) YR.3 ) YR.6 )	Cost included in current recycling program. Ongoing is \$83,350 (excl. CPG and waste reduction programs. This includes
R4-8: Market Development (p. 4-14)	YR.1 \$0 YR.3 \$0 YR.6 \$0	

### **3.3 Solid Waste Collection Programs**

#### **3.3.1 Regulated Solid Waste Collection Programs**

##### **1. WUTC Regulated Hauler Name: Sunrise Disposal**

**G-permit #G-201**

	<u>YR. 1</u>	<u>YR. 3</u>	<u>YR. 6</u>
<b>RESIDENTIAL</b>			
- # of Customers	3000	2900	3100
- Tonnage Collected	6721	6600	6750
<b>COMMERCIAL</b>			
- # of Customers	400	390	425
- Tonnage Collected	2688	2640	2700

**2. WUTC Regulated Hauler Name: Okanogan Valley/Upper Valley Disposal****G-permit #G-21**

	<u>YR. 1</u>	<u>YR. 3</u>	<u>YR. 6</u>
<b>RESIDENTIAL</b>			
- # of Customers	2914	2972	3011
- Tonnage Collected	3970	4049	4089
<b>COMMERCIAL</b>			
- # of Customers	468	477	482
- Tonnage Collected	646	658	665

**3. WUTC Regulated Hauler Name: Methow Valley Sanitation Service****G-permit #G-146**

	<u>YR. 1</u>	<u>YR. 3</u>	<u>YR. 6</u>
<b>RESIDENTIAL</b>			
- # of Customers	888	888	976
- Tonnage Collected			
<b>COMMERCIAL</b>			
- # of Customers	263	263	276
- Tonnage Collected	2,231	2,010	2,215
<i>(Combined commercial-residential tonnage)</i>			

**4. WUTC Regulated Hauler Name: Zippy Disposal****G-Permit #G-121**

	<u>YR. 1</u>	<u>YR. 3</u>	<u>YR. 6</u>
<b>RESIDENTIAL</b>			
- # of Customers	287	301	328
- Tonnage Collected	321	337	367
<b>COMMERCIAL</b>			
- # of Customers	77	77	77
- Tonnage Collected	1370	1372	1400

**5. WUTC Regulated Hauler Name: Couse's Sanitation & Recycle  
G-Permit #G-169**

	<u>YR. 1</u>	<u>YR. 3</u>	<u>YR. 6</u>
<b>RESIDENTIAL</b>			
- # of Customers	48	48	48
- Tonnage Collected	17.1	17	17
<b>COMMERCIAL</b>			
- # of Customers	2	2	2
- Tonnage Collected	13.3	13	13

Notes: Year 1 (2009) split between residential and commercial based on assuming residential refuse collection quantity at 1000 pounds per customer per year. This assumption yields commercial tonnage that is consistent with garbage generation per employee by business type estimates from King County as applied to 2009 employment by business type for Okanogan County from 2009 *County Business Patterns*. 2010 total refuse collection quantity, residential customer counts and commercial customer counts for each hauler based on hauler interviews.

Residential customer growth rates based on population growth rates. Commercial customer growth assumed at 25% of residential customer growth.

**3.3.2 Other (non-regulated) Solid Waste Collection Programs**

**Hauler Name: City of Oroville**

	<u>YR. 1</u>	<u>YR. 3</u>	<u>YR. 6</u>
<b>RESIDENTIAL</b>			
- # of Customers	567	567	567
- Tonnage Collected	287	287	287
<b>COMMERCIAL</b>			
- # of Customers			
- Tonnage Collected	287	287	287

Notes: Same as for regulated haulers.

<u>PROPOSED</u> PROGRAM	COST	FUNDING
R7-1: Minimum Container Sizes and Residential Service Levels (p. 7-8)	YR.1 \$0 YR.3 \$0 YR.6 \$0	
R7-2: Incentive rate Structures (p. 7-8)	YR.1 \$0 YR.3 \$0 YR.6 \$0	

R7-3: Private Roads (p.7-8)	YR.1 \$0 YR.3 \$0 YR.6 \$0
R8-1: Continue Existing Transfer costs for current System (p. 8-4) Tip fees. per year.	YR.1 ) Cost is included in ongoing YR.3 ) transfer system funded by YR.6 ) Ongoing cost is \$330,360
R8-2: Evaluate Additional Transfer Station (p. 8-4)	YR.1 \$0 YR.3 \$0 YR.6 \$0
R8-3: Private Facilities (p. 8-4)	YR.1 \$0 YR.3 \$0 YR.6 \$0

**3.4 Energy Recovery & Incineration (ER&I) Programs**  
No ER&I facilities used in Okanogan County.

R6-1: Monitor Status of Processing Technologies (p. 6-15)	YR.1 \$0 YR.3 \$0 YR.6 \$0
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**3.5 Land Disposal Program**

**3.5.1 Landfill Name: Central Landfill**  
**Owner: Okanogan County**  
**Operator: Okanogan County**

3.5.2 Estimate the approximate tonnage disposed at the landfill by WUTC regulated haulers. If you do not have a scale and are unable to estimate tonnages, estimate using cubic yards, and indicate whether they are compacted or loose.<sup>14</sup>  
Note: Estimates given here are based on hauler interview data

YR.1 17,977    YR.3 17,696    YR.6 19,192

3.5.3 Using the same conversion factors applied in 3.5.2, please estimate the approximate tonnage disposed at the landfill by other contributors.

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<sup>14</sup> Compacted cubic yards will be converted at a standard 1100 pounds per yard. Loose cubic yards will be converted at a standard 500 pounds per cubic yard. Please specify an alternative conversion ratio if one is presently in use in your jurisdiction.

Note: Estimates given here are derived from total tonnage projections given in 2.2.1, less regulated hauler disposal tonnage given in 3.5.2.

YR.1 10,569    YR.3 12,742    YR.6 12,187

3.5.4 Estimated cost of operating (including capital acquisitions) the Central Landfill.

YR.1 \$1,188,610.    YR.3 \$1,723,978.    YR.6 \$1,903,990.

3.5.5 Please describe the funding mechanism(s) that will defray the cost of this component.

Transfer station and landfill tip fees fund landfill costs.

<u>PROPOSED</u> PROGRAM	COST	FUNDING
R9-1: Continue Post-Closure ongoing program Monitoring (p. 9-10) Tip fees at an	YR.1 \$0  YR.3 \$0  YR.6 \$0 \$700. (Total costs \$64,575)	This already  is funded by  annual cost of  monitoring
R9-2: Continue Near-Term Operation of ongoing program Central landfill (p. 9-10) Tip fees at an \$1,946,500.	YR.1 \$0  YR.3 \$0  YR.6 \$0	This already  is funded by  annual cost of
R9-3: Waste Import (p. 9-10)	YR.1 \$0 YR.3 \$0 YR.6 \$0	
R9-4: Waste Export (p. 9-10)	YR.1 \$0 YR.3 \$0 YR.6 \$0	
R9-5: Future Disposal (p. 9-11)	YR.1 \$0 YR.3 \$0 YR.6 \$0	
R10-1: PCS Acceptance and Remediation (p. 10-9)	YR.1 \$0 YR.3 \$0	

	YR.6 \$0		
R10-2: Infectious Waste (p. 10-9)	YR.1 \$0 YR.3 \$300 YR.6 \$300		Tip Tip
R10-3: Tire Management (p. 10-9)	YR.1 \$0 YR.3 \$75 YR.6 \$150		Tip Tip
R10-4: White Goods (p. 10-10)	YR.1 \$0 YR.3 \$0 YR.6 \$0		
R10-5: Asbestos (p. 10-10)	YR.1 \$0 YR.3 \$0 YR.6 \$0		
R11-1: Continue MRW Facility at ongoing program Central Landfill (p. 11-10) is funded by Tip fees and CPG cost of \$91,650.	YR.1 \$0 YR.3 \$0 YR.6 \$0	This YR.3	already \$0 grants at annual
R11-2: MRW Promotion and ongoing program Education (p. 11-10) fees and CPG cost of \$3,000.	YR.1 \$0 YR.3 \$0 YR.6 \$0	This	already is funded by Tip grants at annual
R11-3: MRW Reuse (p. 11-10)	YR.1 \$0 YR.3 \$0 YR.6 \$0		

**3.6 Administration Program**

3.6.1 Budgeted cost for administering solid waste and recycling programs and major funding sources are given below.

Budgeted Cost

YR.1 \$164,200    YR.3 \$195,850    YR.6 \$212,500

Funding Source

YR.1 CPG, Tip, & Interest YR.3 Same as YR.1 YR.6 Same as YR.1

3.6.2 Administration cost components included in these estimates are:

Wages, benefits, supplies, professional services, advertising, taxes, miscellaneous.

3.6.3 Department of Ecology CPG grant, tip fees and interest are used to recover the cost of each of these cost components.

<u>PROPOSED</u> PROGRAM	COST	FUNDING
R12-1: Cities Participation (p. 12-8)	YR.1 \$0 YR.3 \$0 YR.6 \$0	
R12-2: City Management (p. 12-9)	YR.1 \$0 YR.3 \$0 YR.6 \$0	
R12-3: Health District Role (p. 12-9)	YR.1 \$0 YR.3 \$0 YR.6 \$0	
R12-4: SWAC Role (p. 12-9)	YR.1 \$0 YR.3 \$0 YR.6 \$0	
R12-5: Public Works Management (p.12-9) program Tip & interest.	YR.1 \$0 YR.3 \$0 YR.6 \$0	This already ongoing is funded by CPG, Ongoing cost is \$750.

**3.7 Other Programs: None**

**3.8 References and Assumptions: See notes provided in each section above or below.**

**4. FUNDING MECHANISMS:**

**Table 4.1.1 Facility Inventory**

Facility Name	Type of Facility	Tip Fee per Ton	Transfer Cost	Transfer Station Location	Final Disposal Location	Total Tons Disposed	Total Revenue Generated (Tip Fee x Tons)
Bridgeport TS	transfer	\$74		Bridgeport	Central Landfill	4,790	\$354,460
Ellisforde TS	transfer	\$74		Ellisforde	Central Landfill	5,650	\$418,100
Twisp TS	transfer	\$74		Twisp	Central Landfill	3,930	\$290,820
Central Landfill	disposal	\$74				<u>14,230</u>	<u>\$5,053,020</u>
						28,600	\$2,116,400

**Table 4.1.2 Tip Fee Components**

Tip Fee by Facility	Surcharge	City Tax	County Tax	Debt/Capital Costs	Operational Cost	Administration Cost	Closure Costs
All at \$74				25.7%	48.3%	9.3%	17.3%

**Table 4.1.3 Funding Mechanism**

Name of Program Funding Mechanism will defray costs	Bond Name	Total Bond Debt	Bond Rate	Bond Due Date	Grant Name	Grant Amount	Tip Fee	Taxes	Other	Surcharge
Administration							X			
Collection									Rates	
Transfer/Disposal					CPG		X		Interest	
WRR					CPG	\$43,260	X		Sales	
MRW					CPG	\$43,260	X			

**Table 4.1.4 Tip Fee Forecast**

Tip Fee per Ton by Facility	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
All	\$74	\$74	\$74	\$74	\$74	\$74

4.2 **Funding Mechanisms** summary by percentage:

<b>Table 4.2.1 Funding Mechanism by Percentage</b>						
<b>Year One</b>						
Component	Tip Fee %	Grant %	Bond %	Collection Tax Rates %	Other %	Total
Waste Reduction & Recycling	42.6%	23.7%			33.7%	100%
Collection					100.0%	100%
Transfer	100.0%					100%
Land Disposal	95.9%				4.1%	100%
Administration	100.0%					100%
MRW	47.5%	52.5%				100%
Closure	100.0%					100%
Debt Service	100.0%					100%

<b>Table 4.2.2 Funding Mechanism by Percentage</b>						
<b>Year Three</b>						
Component	Tip Fee %	Grant %	Bond %	Collection Tax Rates %	Other %	Total
Waste Reduction & Recycling	42.6%	23.7%			33.7%	100%
Collection					100.0%	100%
Transfer	100.0%					100%
Land Disposal	95.9%				4.1%	100%
Administration	100.0%					100%
MRW	47.5%	52.5%				100%
Closure	100.0%					100%
Debt Service	100.0%					100%

<b>Table 4.2.3 Funding Mechanism by Percentage</b>						
<b>Year Six</b>						
Component	Tip Fee %	Grant %	Bond %	Collection Tax Rates %	Other %	Total
Waste Reduction & Recycling	42.6%	23.7%			33.7%	100%
Collection					100.0%	100%
Transfer	100.0%					100%
Land Disposal	95.9%				4.1%	100%
Administration	100.0%					100%
MRW	47.5%	52.5%				100%
Closure	100.0%					100%
Debt Service	100.0%					100%

**4.3 References and Assumptions:**

*See Excel spreadsheet 405 which lists 2009 budget. This budget was used to project Year 3 (2011 and Year 7 (2014) in 2009 dollars.*

**4.4 Surplus Funds**

Okanogan County's Solid Waste Fund.

## H. 6/20 Year Capital Improvements

## 6/20 Year Capital Improvements

6 Year Plan	Improvements	Total Estimated Cost
Ellisforde	Resurface tipping area pads possible rebuilding	\$120,000.00
	Of whole tipping area with improvements to sump	
	System.	
Bridgeport	Resurface and overlay tipping area	\$28,000.00
Twisp	Water system improvement to have adequate supply.	\$10,000.00
Central Landfill	Closure and cap of cell one \$2,580,000.00	\$3,080,000.00
	Expansion of water storage (tanks) \$500,000.00	
Central Landfill	Expansion of Cell 3	\$1,650,000.00
Central Landfill	Monitor Well #5	\$42,600.00
<b>20- Year Plan</b>		
Bridgeport Transfer Station	Relocating Transfer station to Okanogan County with facilities for recycling and household hazardous waste	\$2,850,000.00
Central Landfill	Extending site life of landfill. Acquiring neighboring property or using adjoining county property called central pit.	No estimate available.
6/22/2011	Permitting of adjoining properties	
	Potential siting of landfill in another location.	
	Major recycling program in accordance with the state recycle plan.	