

Marion County

Solid Waste Management Plan Updated November 2002

**Prepared by
DCS, Inc.**

in association with

**URS Corporation
&
GBB, Inc.**

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Residential Rates Comparison, December 2001 (Chapter 5) A-1

APPENDIX B
Household Hazardous Waste Management PlanB-1

**TABLE B-2. ESTIMATED COST TO SITE, CONSTRUCT, AND OPERATE
SUBTITLE D LANDFILL**

Waste Flow 50,000 Tons/year

Category	Estimated Cost (2002 \$)	
Initial Capital Investment		
Siting and Permitting		
Siting Study	200,000	300,000
Site Selection	500,000	750,000
Prelininary Design & Permitting	400,000	500,000
Site Purchase (150 - 200 Acres @ \$15,000/Acre)	2,250,000	3,000,000
Siting and Permitting Subtotal	3,350,000	4,550,000
Site Development		
Development (\$150,000/Acre) (15 to 20 Acres)	2,250,000	3,000,000
Support Facilities (Leachate, Roads, Fence, Scales)	3,000,000	4,000,000
Surface Water Management	300,000	500,000
Environmental Monitoring	300,000	500,000
Subtotal	5,850,000	8,000,000
Contingency (15%)	877,500	1,882,500
Legal, Admin, Permitting (7%)	409,500	878,500
Engineering (7%)	409,500	753,000
Construction Services (8%)	468,000	1,004,000
Site Development Subtotal	8,014,500	12,518,000
Total Initial Capital Investment	11,364,500	17,068,000
Annual Amoritized Cost (20 years @ 7%)	1,072,695	1,611,049
Cost per Ton for Initial Capital Investment (100,000 Tons/Year)	\$21.45	\$32.22
Operating Expenses		
Annual Operation & Maintenance Costs	\$18.00	\$23.00
Closure	\$3.00	\$3.00
Post Closure	\$1.50	\$1.50
New Cell Development	\$4.00	\$6.00
Operating Expenses Subtotal	\$26.50	\$33.50
Total Cost per Ton	\$47.95	\$65.72

The above is a planning level estimate intended to provide the County with general costs of constructing a new landfill

**Table A-1
Residential Rates Comparison, December 2001**

Area	20-Gal. Garbage 60-Gal Yard Debris	32-Gal. Garbage 60-Gal Yard Debris	60-Gal. Garbage 60-Gal Yard Debris	90-Gal. Garbage 60-Gal Yard Debris	Disposal Rate
ALBANY Commingled		\$11.00 90-Yd Debris Bi-Wkly		\$18.00 (90-Gal.) 90-Yd Debris Bi-Wkly	\$20.00
CLACKAMAS CO. Commingled Paper/Plastic/Tin Separate Glass - Colors	\$18.10 No Yd Debris	\$20.50 No Yd Debris	\$28.75 No Yd Debris	\$33.45 No Yd Debris	\$67.50
CORVALLIS Commingled Separate Glass - Colors		\$11.50 (35-Gal.) 110-Yd Debris Wkly	\$15.50 (64-Gal.) 110-Yd Debris Wkly	\$19.50 110-Yd Debris Wkly	\$20.00
EUGENE Separated		\$12.45 No Yd Debris	\$25.40 No Yd Debris	\$36.70 No Yd Debris	\$46.00
GLADSTONE Commingled Paper/Plastic/Tin Separate Glass - Colors		\$17.65 32-Yd Debris Wkly	\$31.50 Customer provides (2) 60-Yd. Debris Wkly	\$33.15 Addtl. \$2.50 Yd Debris Pile - Bag - Can Wkly	\$67.50
GRESHAM Commingled		\$18.50 32-Yd Debris Wkly	\$25.50 32-Yd Debris Wkly	\$28.75 Weekly Yd	\$67.50
HILLSBORO Commingled Paper/Plastic/Tin Separate Glass - Colors		\$16.54 (35-Gal.) Yd Debris Bi-Wkly	\$24.81 Yd Debris Bi-Wkly		\$55.00
MILWAUKIE Commingled Paper Separate Plastic/Tin/Glass	\$17.20 No Yd Debris	\$19.90 Weekly Yd	\$27.60 Weekly Yd	\$32.20 Wkly Yd	\$67.50
MOLALLA Commingled Paper Separate Plastic/Tin/Glass		\$15.90 (35-Gal.) No Yd Debris	\$27.60 No Yd Debris	\$29.20 No Yd Debris	\$67.50
OREGON CITY Commingled Paper/Plastic/Tin Separate Glass - Colors		\$21.05 (35 Gal.) Weekly Yd	\$30.70 Weekly Yd	\$31.00 Weekly Yd	\$67.50
PORTLAND Commingled	\$18.25 32-Yd Debris Bi-Wkly	\$19.80 32-Yd Debris Bi-Wkly	\$23.80 32-Yd Debris Bi-Wkly	\$27.05 32-Yd Debris Bi-Wkly	\$67.50

**Table A-1,
continued**

Area	20-Gal. Garbage 60-Gal Yard Debris	32-Gal. Garbage 60-Gal Yard Debris	60-Gal. Garbage 60-Gal Yard Debris	90-Gal. Garbage 60-Gal Yard Debris	Disposal Rate
SALEM Separated	\$13.20 90-Yd Debris Wkly	\$14.95 90-Yd Debris Wkly	\$21.30 (64-Gal.) 90-Yd Debris Wkly		\$67.45
SILVERTON Commingled	\$16.65 65-Yd Debris Wkly	\$18.00 65-Yd Debris Wkly	\$21.90 (65-Gal.) 65-Yd Debris Wkly	\$23.60 65-Yd Debris Wkly	\$67.50
STAYTON Commingled	\$14.00 Weekly Yd	\$17.00 Weekly Yd	\$23.50 (64-Gal.) Weekly Yd	\$26.50 Weekly Yd	\$67.50
TUALATIN Commingled	\$14.60 Weekly Yd	\$17.10 Weekly Yd	\$22.95 Weekly Yd		\$67.50
WEST LINN Commingled Separate Glass - Colors		\$19.55 (35-Gal.) 65-Yd Debris Wkly	\$31.28 65-Yd Debris Wkly	\$34.41 (95-Gal.) 65-Yd Debris Wkly	\$67.50
WILSONVILLE Commingled	\$15.60 Weekly Yd	\$17.50 Weekly Yd	\$23.40 Weekly Yd		\$67.50
WOODBURN Commingled Separate Glass - Colors	\$13.50 65-Yd Debris Wkly	\$15.65 65-Yd Debris Wkly	\$23.50 (65-Gal.) 65-Yd. Debris Wkly	\$29.50 65-Yd Debris Wkly	\$67.45

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GLOSSARY

anaerobic biodegradation – The breakdown of organic matter by natural processes that do not use oxygen.

BI – Brown’s Island Demolition Landfill (see facility description in Chapter 2)

C&D – construction and demolition waste

commingled – Placement by residents of a variety of recyclable materials into a single container for curbside collection. Compare to **source-separated**.

composting – A process by which organic matter is decomposed under controlled conditions into its component parts, and subsequently used for mulching or as a soil supplement.

composting facility – A facility designed to facilitate the controlled process of biologic conversion of some portions of municipal solid waste (i.e., yard waste) into material for land spreading and soil enrichment.

disposed waste – The total amount of waste delivered to the WTEF or disposed of at a landfill, in or out of the County, as reported to ODEQ by the operators.

franchised collection companies – see **service providers**

green waste – garden, food and wood waste

generated waste – The sum of **disposed waste** and recycled waste.

heavy metals – Any of a class of metals of high atomic weight and density, such as mercury, lead, zinc, and cadmium, that are known to be toxic to living organisms.

HHV – higher heating value

HHW – **household hazardous wastes** (see definition)

household hazardous wastes – Products found in the home that present potential health and safety hazards. These products are often labeled as toxic, flammable, corrosive, reactive, infectious or radioactive.

landfill – A solid waste facility or part of a facility for the permanent disposal of solid wastes in or on the land. This includes a sanitary landfill, balefill, landspreading disposal facility, or a hazardous waste, problem waste, special waste, woodwaste, limited purpose, inert, or demolition waste landfill.

leachate – Water or other liquid that has been contaminated by dissolved or suspended materials as a result of contact with solid waste or solid waste byproducts.

liners – Materials used to prevent the passage of leachate from one part of the landfill area to another. May be composed of soil or may be a synthetic material.

MACT - maximum achievable control technology

MRRF – Marion Resource Recovery Facility, previously called Marion Recycling Facility, Inc. (see facility description in Chapter 2)

MSW – **municipal solid waste** (see definition)

municipal solid waste - waste generated by residences, offices, institutions, commercial businesses and other waste generators not producing special wastes

NMCDF - North Marion County Disposal Facility (see facility description in Chapter 2)

OAR – Oregon Administrative Rules

ODEQ – Oregon Department of Environmental Quality

ORS – Oregon Revised Statutes

PAYT - Pay-as-You-Throw (see definition)

Pay-as-You-Throw - trash collection programs designed so that households are charged for the amount or volume of trash they generate each week as opposed to each household paying the same trash collection fee

recovery rate – The percentage of materials recovered, relative to the amount of waste generated. The recovery rate, as determined by the statewide goal, is calculated by adding **DEQ** approved credits to the **recycling rate**. More information, including specific credits allowed, can be found in Oregon Revised Statutes, Chapter 459A – Reuse and Recycling (see References).

recycling rate – The percentage of materials recycled, relative to the amount of waste generated (compare to **recovery rate**).

residuals - unrecoverable material received at the recycling centers

service providers – Privately owned businesses that provide garbage collection services. Other terms used for service providers include: **franchised collection companies** and **waste haulers**.

single-stream recycling – a collection method where trash and recyclables are mixed together in curbside disposal and taken to a facility for sorting

SKRTS - Salem–Keizer Recycling and Transfer Station

solid waste – As defined by the Resource Conservation and Recovery Act, a broad term which includes garbage, refuse (e.g., metal scrap, wall board, etc.), sludges from treatment plants, and other materials including solids, semisolids, liquids, or gaseous material from industrial, commercial, mining, agricultural, and community activities. Exceptions include domestic sewage, industrial wastewater, irrigation return flows, nuclear materials, and mining material not removed during the extraction process.

Solid Waste Management Advisory Council - A committee comprised of citizens, businesses, and interested parties appointed to provide input and direction for developing solid waste programs.

source-separated – Separation by residents of recyclable materials into several containers for curbside collection. Compare to **commingled**.

special waste – Certain wastes which have disposal regulations that differ from **MSW**. Each special waste category has its own characteristics and handling requirements. Some examples of special waste are: incineration ash, fluorescent bulbs, hazardous waste, latex paint, styrofoam, and appliances.

SWMP – Solid Waste Management Plan

SWMAC – **Solid Waste Management Advisory Council** (see definition)

TDF - tire derived fuel

TDR - Tire Disposal and Recycling, Inc., a private company that owns facilities to collect and process used tires. TDR has two facilities in Oregon: one in Clackamas and one in Prineville

tipping fee – The fee charged for disposing waste at a landfill or incinerator

the Department – Marion County Department of Solid Waste Management

TPD – tons per day

TPY – tons per year

transfer station – A permanent, fixed, supplemental collection and transportation facility used by persons and route collection vehicles to deposit solid waste into a large transfer vehicle for transport to a permanent disposal site.

waste disposal – The discharging, discarding, or abandoning of solid wastes, hazardous wastes, or moderate risk wastes. This includes the discharge of any such wastes into or on land, air, or water.

waste haulers – see **service providers**

Waste-to-Energy Facility – The plant located in Brooks that burns municipal solid waste and produces electricity. The facility reduces the volume of waste by 90% and results in producing ash residue (see facility description in Chapters 2 and 6).

waste recycling/transfer facility – Any waste processing facility which collects, stores, or treats waste materials for reuse. This can include buy-back recycling centers, drop-off recycling centers, salvage yards, reclamation sites, and waste storage centers.

waste reduction – To reduce, avoid, or eliminate the generation of wastes.

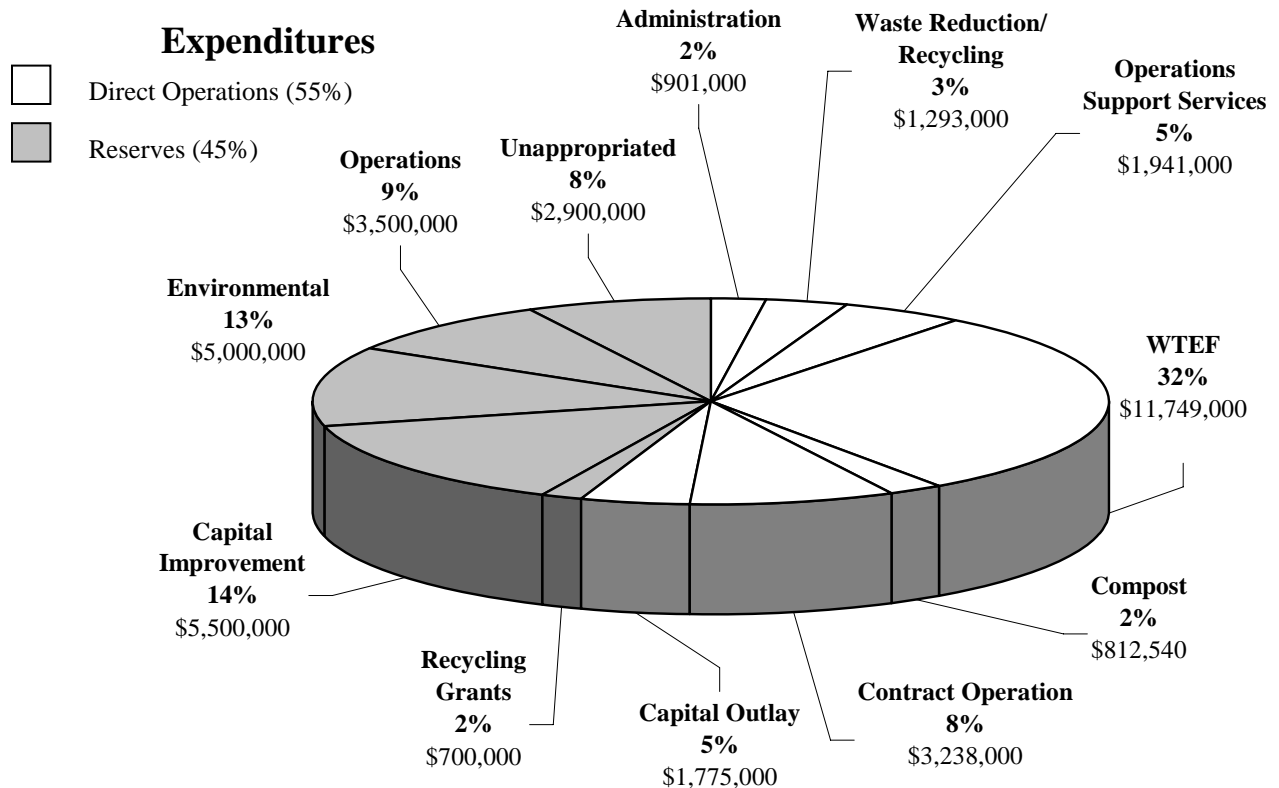
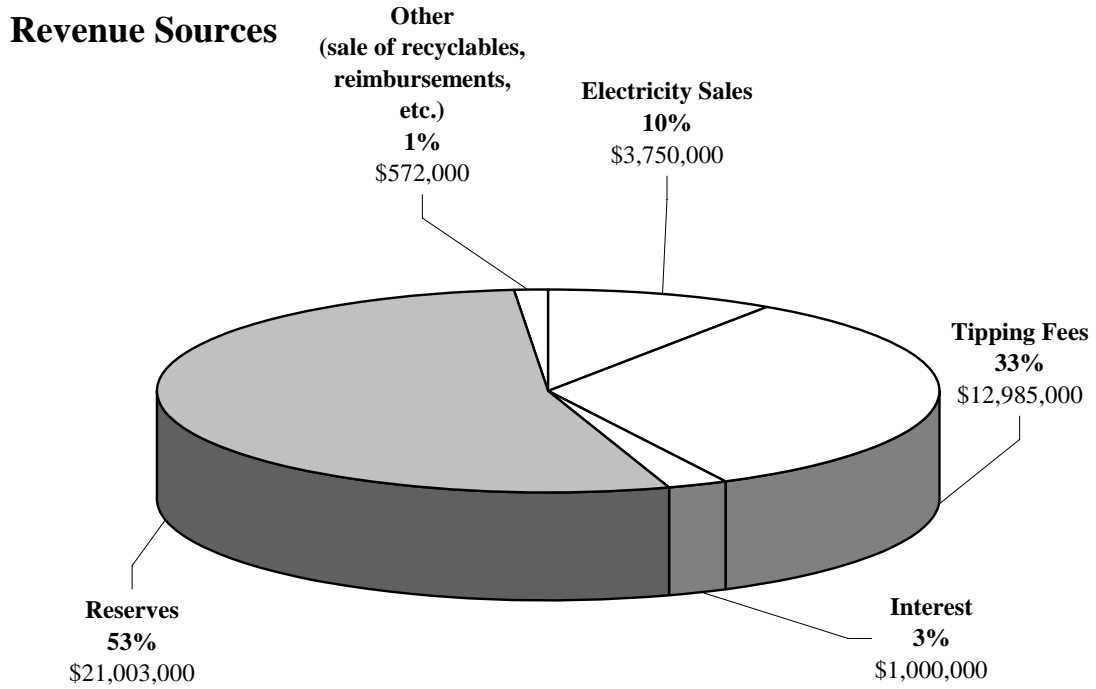
waste stream – The entire spectrum of wastes produced by all waste generators.

Waste-to-Energy Facility – The plant located in Brooks that burns municipal solid waste and produces electricity. The facility reduces the volume of waste by 90% and results in producing ash residue.

WTEF – Waste-to-Energy Facility (see definition)

WWR - Wood Waste Reclamation (see facility description in Chapters 2).

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MARION COUNTY Solid Waste Management Updated Plan 2002

1. INTRODUCTION

1.1 Context of the Updated Plan

In 1995, Marion County (County) prepared its first comprehensive Solid Waste Management Plan (SWMP) (Parametrix, Inc. 1995) that charted a direction for how the solid waste system would be developed. It was accomplished through the leadership of PWES and cooperative efforts of service providers, cities and other private companies driven by the common goal to create an integrated and coordinated approach for managing waste. The Solid Waste Management Advisory Council (SWMAC) provided a forum for dialogue and comment on the SWMP to ensure that public input helped shape the direction and priorities.

Since its adoption, the 1995 SWMP has been used to plan and implement programs and facilities to maintain a cost-effective and environmentally sound solid waste system. Between 1995 and 2000, Marion County's recycling rate has increased from 29 percent to 38 percent (ODEQ 2001). A key component of the system, since 1995, is the startup and operation of facilities to process yard debris and wood waste into compost and other organic products.

The franchised collection companies have continued to make investments to enhance and expand collection programs. These collection companies entered into a cooperative agreement to expand the MRRF. At this facility, commercial waste can now be processed and certain materials can be recovered. Also, the Waste-to-Energy Facility (WTEF) has installed new equipment in order to keep pace with air quality standards while maintaining an excellent service record.

Most important is that citizens and businesses of Marion County have responded favorably to these new programs and services by participating in waste reduction and recycling of more materials.

Despite the large gains in reducing waste and recycling more materials, the population and economic growth in Marion County has resulted in more waste being handled by the system. Between 1993 and 2000, the total amount of waste generated increased by 45 percent (see Table 2-5). Between 2000 and 2010, waste generated is forecasted to increase by another 25 percent by 2010 (see Chapter 6).

This growth must be addressed as part of a comprehensive strategy for several reasons. First, the State passed new legislation that set a new recovery rate (recovery rate is the recycling rate plus some additional credits) for Marion County of 54 percent of its waste

stream by the year 2009 (ORS 459A.010). For perspective, Marion County's recovery rate was at 44 percent in 2000 (ODEQ 2001). Second, because the WTEF has a limited capacity, Marion County must determine how to dispose of increasing amounts of waste beyond plant capabilities. And, third franchised collection companies are in the process of moving to semi or fully automated collection equipment. This change will not only affect refuse collection practices, but will impact how source separated recyclable materials will be collected and processed.

Considering these issues and the fact that several factors have changed since its adoption, the County has committed to update the 1995 SWMP. Specifically, the update will accomplish the following:

- Review the progress to date and verify if assumptions made in 1995 are still valid;
- Consider impacts from changes in regulations, technology and market conditions;
- Determine if and when new or expanded facilities will be required; and,
- Update administrative and management practices to ensure financial stability.

The Updated SWMP will provide a forward look at the solid waste management system and identify the needs and opportunities for the next 10 years. It will provide decision-makers with a general direction as to what facilities and programs are required to continue the success of the solid waste management system.

The County, together with stakeholders (local jurisdictions, private sector operators and the public), must continually review the progress made and assure the overriding needs and values of the community and the overall waste system are being met. By following the direction and priorities presented in the Updated SWMP, Marion County will enhance and improve the quality of services and maintain a cost effective solid waste management system.

1.2 Plan Purpose and Goals

This Updated SWMP is designed to provide guidance on solid waste management issues over a 10-year planning period (2002-2012). However, it should be recognized that solid waste practices, regulations, and technologies are extremely dynamic in nature and will result in a need to update and revise the SWMP on a regular basis in the future.

The guiding principle in Marion County's solid waste management planning is that solid waste should be viewed and managed as a resource. The County strives to conserve resources through behavioral changes and recognizes the integral link between solid waste management, the environment, and ultimately the quality of life. This 2001 SWMP Update presents a comprehensive long-term approach to solid waste management in the County, designed around this resource conservation and management principle. The SWMP Update will provide citizens and decision-makers in the County with a guide to implement, monitor and evaluate solid waste facilities and programs in the future. Recommendations developed for the SWMP Update not only guide local decision-

makers, but substantiate the need for local funds and state grants for local solid waste projects and new programs.

Marion County, working cooperatively with local jurisdictions, the private sector and the public, has been able to achieve an effective and efficient integrated solid waste management system. The system includes the WTEF, landfills, transfer facilities, curbside recycling, waste reduction and recycling facilities, a yard debris/wood waste recycling program, public education and outreach programs. The County's primary objective, as stated in the 1995 SWMP, is to continue in this direction by providing:

“Guidance for continued development and implementation of an integrated solid waste management system that has been developed through a cooperative effort of local governments, citizens and industry. The SWMP should achieve development of a system which is environmentally sound, technologically feasible, cost-effective, locally controlled and publicly acceptable; and provides for an overall reduction in long-term per capita waste generation and toxicity.”

Achieving this objective requires that the Plan attain a balance between cost-effectiveness and environmental responsibility, as well as being technologically feasible and accepted by the public. To ensure that this will be obtainable, the Solid Waste Management Advisory Council and public participants developed specific objectives that the solid waste system should strive to attain. These specific objectives are:

1. To provide an integrated solid waste management system that achieves an effective combination of strategies and programs guided by the principles adopted in the state hierarchy to reduce waste at the source, reuse and recycle materials, compost, recover energy and land disposal.
2. To continue educating consumers in order to promote practices and methods to reduce the long-term per capita waste generation.
3. To develop programs and support implementation of facilities that seek to ensure materials recovered from the waste stream attain the highest and best use and are recycled.
4. To develop a solid waste system that is based on sound financial principles, provides cost effective services and maintains rates stability over a long term, while allocating cost equitably to all users.
5. To maintain system flexibility to respond to changes in waste stream composition, waste management technologies, public preferences, new laws and changing circumstances.
6. To provide services that meet the diverse needs of businesses and residences in urban and rural communities and that is both effective and fair to all users.

7. To maintain a cooperative approach between the cities, county and other local governments by providing opportunities for regional networking to ensure successful implementation of the SWMP.
8. To ensure ongoing public input opportunities through the development and implementation of this Plan.

One of the components of Marion County's primary objective, as stated above, is to protect the environment by emphasizing waste reduction. To achieve this, the County must establish a target waste recovery rate and reach or exceed that level by the year 2009. The statewide goal established by ODEQ sets Marion County's recovery rate at 54 percent for 2009 (ORS 459A.010). This target will be measured on an annual basis, and programs and facility assessments will be made on the County's progress towards reaching this state goal.

In addition to the state recovery rate goal, additional goals identified by the SWMAC that apply to the current solid waste system in Marion County include the following:

- Achieve cost-effective diversion by maintaining long-term disposal capacity and avoiding significant, additional capital investments for new disposal facilities.
- Maintain the role of the WTEF in the County, "region" and state. (The WTEF currently provides processing and energy recovery for waste from Marion County and certain other counties and regions of the state.)
- Develop a long-term management strategy to facilitate cost-effective utilization of the WTEF. (The WTEF has reached capacity; therefore, other disposal options must be explored.)
- Generate and evaluate alternatives to further enhance the County's current 44 percent recovery rate (including but not limited to an evaluation of enhanced curbside collection).

1.3 Issues Addressed by the Plan

Since 1995, several issues have emerged that pertain to managing solid waste consistent with the values and principles established in the 1995 SWMP. The 2002 SWMP addresses these issues, evaluates alternatives, and recommends a course of action to respond to these needs. Some of the key issues include the following:

1. With the State adopting new recovery goals, what are the next steps toward reducing waste and decreasing the dependency on landfill disposal?

Marion County and service providers have implemented a full range of programs aimed at preventing and reducing the amount of waste generated, and has developed

certain facilities to process and recycle materials. The Update must focus on ways to enhance existing programs and facilities to recover more materials. Also, a careful review of the waste stream is warranted to enable the County to apply resources wisely to increase the amount of waste reduction and recycling.

2. What changes are needed in the solid waste system to deal with the transition from collecting source-separated materials to one that collects commingled materials at the curbside?

Service providers are beginning to implement a change in the system using semi or fully automated collection vehicles. This system allows more efficient collection and will allow households to place several types of recyclable materials into one or two containers. In other areas where these systems operate, participation in curbside recycling programs has increased, as have the quantities of materials recovered for recycling. As the system is implemented, education and promotion programs will need to be modified, and new facilities to process and handle commingled materials may also be required.

3. Growth in the County resulted in the disposal of 51,000 tons of MSW in landfills in 2000, an increase of over 100 percent since 1993. What will be the long-term strategy for managing this waste stream?

In 1993 (the base year used in the 1995 SWMP) the County disposed of less than 5,000 tons of municipal solid waste (MSW) in landfills (in-county and out-of-county). This MSW sent to landfills was in excess of the MSW incinerated at the WTEF. During that same year, Brown's Island Landfill received 19,000 tons of inert demolition material. In 2000, ODEQ reported over 36,000 tons of MSW from Marion County going to landfills outside the County, beyond the amount incinerated at the WTEF. In addition, approximately 15,000 tons of demolition material was disposed of at Brown's Island (See Parametrix 1995 and Chapter 6 in this document for sources of these figures and more information). Because the capacity of the WTEF is fixed, the amount of waste disposed at landfills will continue to grow as the waste stream increases. A long-term strategy needs to be developed.

4. What actions should the County take to maintain rate stability and ensure that potential environmental liabilities are adequately funded?

This issue is related to the increasing amount of MSW that is disposed outside of the County. Individuals electing to haul waste outside of the County avoid paying certain fees aimed at funding countywide programs for waste reduction and recycling. This results in users of the County system subsidizing services for those individuals who choose to haul their waste out of the County. They also avoid paying their fair share of debt service for existing facilities, environmental controls for closed landfills and any other fixed system cost. A strategy whereby all users pay fairly for these programs and services needs to be developed.

These represent some of the more significant issues and concerns addressed in this updated SWMP. However, each Chapter of the Plan discusses the needs and opportunities pertaining to that aspect of the solid waste system. As each aspect of the solid waste system is reviewed and updated, issues related to meeting the goals of the SWMP are addressed.

1.4 The County's Role in Solid Waste Planning and Operations

PWES has the primary responsibility for planning and operating the County's solid waste system, and the County Board of Commissioners oversees the activities of PWES. PWES has authority to direct all solid waste to designated transfer, resource recovery or other disposal facilities. This authority, granted by the State of Oregon (ORS 459.125), allows the County to:

“Regulate, license, franchise and certify disposal, transfer and material or energy recovery sites or facilities; establish, maintain and amend rates charged by disposal, transfer and material or energy recovery sites or facilities; establish and collect license or franchise fees; and otherwise control and regulate the establishment and operation of all public or private disposal, transfer and material or energy recovery sites or facilities located within the county. Licenses or franchises granted by the board may be exclusive.”

The control of waste transfer granted under ORS 459.125 is specific to Marion County. In general, local administrations in Oregon that manage solid waste (i.e. cities, counties, metropolitan service districts), including Marion County, are permitted to enter into agreements with state, local governments, or private parties under ORS (459.065):

*“(a) For joint franchising of service or the franchising or licensing of disposal sites.
(b) For joint preparation or implementation of a solid waste management plan.
(c) For establishment of a joint solid waste management system.
(d) For cooperative establishment, maintenance, operation or use of joint disposal sites, including but not limited to energy and material recovery facilities.
(e) For the employment of persons to operate a site owned or leased by the local government unit.
(f) For promotion and development of markets for energy and material recovery.
(g) For the establishment of landfills including site planning, location, acquisition, development and placing into operation.”*

To provide services for managing waste, the County contracts with private companies to operate most facilities. By using contracts to manage the system, the County maintains flexibility to respond to changing regulations and emerging technologies, and also employs the resources and experience of private service providers. This approach takes advantage of private sector expertise and efficiencies, while enabling the County to be part of managing and overseeing the solid waste system.

7. ADMINISTRATION AND ENFORCEMENT

7.1 Introduction

This chapter of the 2002 Updated Solid Waste Management Plan (SWMP) considers current practices for the administration and enforcement of Marion County's solid waste management program. It reviews the Public Works - Environmental Service Department organization and the County's legislation, policies, procedures, enforcement and funding to determine their effectiveness. This review offers an evaluation and recommendations to enhance and improve administration and enforcement for the solid waste system as needed.

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7.1.1 Management System Goals

The County's PWES manages its program through an approach that provides appropriate administration and enforcement to meet current program needs and prepare for changes as the County's population grows in the 21st century.

To meet the growing demands for solid waste service, PWES has established the following goals to:

- Achieve cost-effective diversion by maintaining long-term disposal capacity and avoiding significant, additional capital investments for new disposal facilities.
- Maintain the role of the WTEF in the County, "region" and state. (The WTEF currently provides processing and energy recovery for waste from Marion County and certain other counties and regions of the state.)
- Develop a long-term management strategy to facilitate cost-effective utilization of the WTEF. (The WTEF has reached capacity; therefore, other disposal options must be explored.)
- Generate and evaluate alternatives to further enhance the County's current 44 percent recovery rate (including but not limited to an evaluation of enhanced curbside collection).

The County, through a continuous comparison of these goals and PWES' activities, can determine the effectiveness of its current services and identify any changes that may be necessary to improve the management of solid waste in Marion County.

7.2 Background and Existing Conditions

7.2.1 Existing Solid Waste Administrative Agencies

Marion County is the lead jurisdiction responsible for planning and implementing the solid waste services throughout the entire County. It is responsible for carrying out the state-mandated

programs and ensuring that adequate facilities are in place to provide services. PWES acts on behalf of the County to execute the policies and practices adopted by the County.

The management of solid waste in Marion County operates through a series of agreements among the cities, private companies and PWES. Its success is based on how citizens, businesses and policymakers combined their ideas and commitment to support the system.

PWES, with assistance and oversight from the ODEQ, provides the administration, regulation and enforcement for the management and disposal of solid waste. The private sector, in conjunction with non-profit recycling organizations, manages the collection, recovery, transport and disposal of solid waste throughout the County.

Public Works - Environmental Services

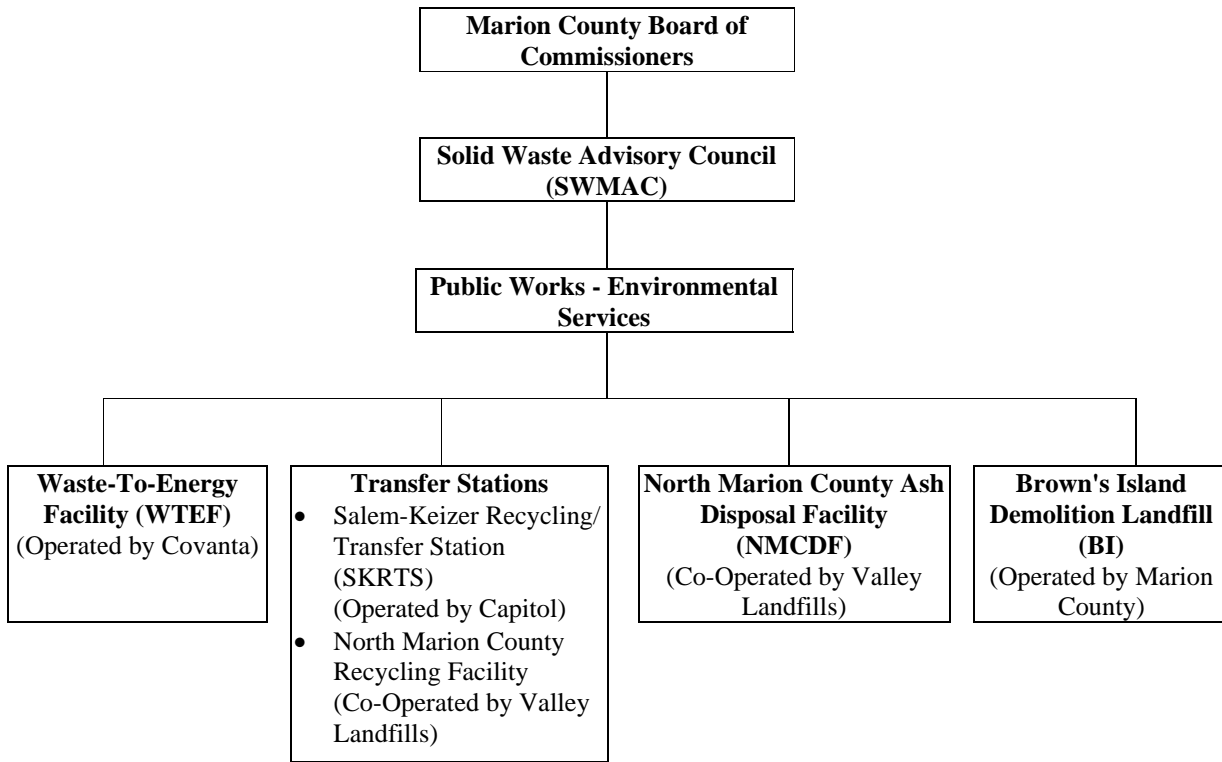
The primary responsibility for managing solid waste in Oregon is assigned to its 36 counties. State law (ORS Section 459.125) gives counties the authority to design, construct, and operate facilities; provide services; contract for facilities or services; and generate revenue. Marion County regulates franchises with nine private collection companies.

PWES, which operates under the direction of the Board of Commissioners, is responsible for the County's solid waste disposal system. Its roles and responsibilities include administration, program and facilities management, policy development, engineering and operations. PWES' complete operation is funded by user fees, state grants, and a franchise fee of 3 percent of each private collection company's gross revenue.

PWES manages the contract operations of the WTEF and owns NMCDF, which is operated by Valley Landfills, Inc. PWES operates the landfill's gatehouse and scales. A private vendor operates the leachate disposal system. Valley Landfills, Inc. operates the transfer station and the ash monofill. PWES also operates the gatehouse and scales at SKRTS. The County owns and operates BI landfill and compost facility. It is also actively involved in promoting, developing and operating waste prevention, reuse and recycling programs throughout the County.

Figure 7-1 provides an overview of PWES' solid waste operations.

**Figure 7-1
Marion County Solid Waste Operations**



The PWES staff of 22 employees operates gatehouse facilities and manages an array of programs, including those that promote waste reduction and recycling throughout the County. PWES' organization includes administration, engineering, office support, waste prevention and recycling staff and gate attendants. Figure 7-2 is PWES' organization chart. PWES is responsible for implementing the recommendations in this Updated SWMP. Its 2001–2002 budget is \$39.3 million with 55.2 percent for operations (includes waste prevention, reuse and recycling programs) and 44.8 percent for its dedicated reserve funds.

PWES has the authority to direct all solid waste to designated transfer stations, resource recovery and other disposal facilities. This authority, provided by ORS 459.125, allows the County to enter into franchise agreements with private companies, which require them to deliver waste to certain disposal sites. This is known as flow control.

Flow control is regulation that provides jurisdictions with the authority to direct wastes to certain facilities. It is important to facilities that rely on specific waste volumes for operation. Oregon law has granted this control to local governments but that changed with a 1994 Supreme Court decision. The case of *C.A. Carbone, Inc. v. Town of Clarkstown* found that flow control violates the Commerce Clause, which prohibits local governments from interfering with interstate commerce.

The Carbone decision was the first in a series of decisions about flow control. Subsequent arguments about the flow of material to any facility have changed how jurisdictions define their authority. Marion County continues to have flow control authority under a grandfather clause enacted by federal legislation. This status allows control through a category known as specific situations. It is possible, of course, that the County's authority for waste flow may be changed over time. The uncertainty of this important issue is a critical factor in planning the management of solid waste.

Municipalities

Marion County contains twenty incorporated communities: Aumsville, Aurora, Detroit, Donald, Gates, Gervais, Hubbard, Idanha, Jefferson, Keizer, Mill City, Mount Angel, St. Paul, Salem, Scotts Mills, Silverton, Stayton, Sublimity, Turner, and Woodburn.

Incorporated cities have the same authority as counties in Oregon for the management of solid waste. State law allows cities to license, contract, or franchise with private companies for solid waste collection. They also have the authority to own and operate solid waste facilities (ORS 459.065).

Cities have the authority to approve rates and program options within their incorporated limits. Cities with populations over 4,000 have responsibilities under SB66 to ensure the implementation of recycling and waste reduction education programs. MSW programs are partially funded by a fee that is separate from the County franchise fee.

Oregon Department of Environmental Quality (ODEQ)

ODEQ provides and maintains funds to assist local governments in planning and implementing solid waste management programs.

ODEQ is responsible for guiding effective programs, cooperation among local governments and the coordination of solid waste management throughout Oregon (ORS section 459.015). Much of this work involves providing educational and technical assistance to government agencies, community and business groups, and citizens. This assistance includes information materials, workshops, and seminars.

ODEQ also supports research and demonstration projects to encourage waste prevention and resource recovery. It provides grants to assist jurisdictions in implementing specific programs and is responsible for the development and oversight of regulations for managing solid and hazardous waste.

Marion County Solid Waste Management Advisory Council

Marion County has had a solid waste advisory group since 1979. The initial group, known as the Solid Waste Advisory Council, was formed to address the issues related to an ODEQ order mandating that the County close BI. Its work included recommending system improvements and construction of the WTEF.

Today the group is called the Solid Waste Management Advisory Council (SWMAC). It was created in 1987 as a 22-member panel composed of representatives of local government, special interest groups and citizens. The council participated in preparing the 2002 Updated SWMP by reviewing material provided by the consultant team, offering comments, and by considering alternatives and recommendations that were developed. Marion County's Board of Commissioners relies on the SWMAC to offer advice and counsel in developing strategies and policies for managing solid waste. The Council has played an important role in advising the County on planning and implementing its waste reduction/reuse, recycling, and solid waste programs. It is a forum for ideas, information and innovation and should continue its role in serving the County.

[Insert Figure 7-2.]

7.2.2 Solid Waste Enforcement

ODEQ has the lead responsibility for enforcing solid waste management and air quality regulations, and permitting all waste-related facilities in Marion County and throughout the State of Oregon. Marion County Solid Waste Management Department is responsible for enforcing illegal dumping regulations.

The following sections describe the enforcement responsibilities for solid waste management.

- **Solid Waste Facilities.** ODEQ issues solid waste permits for each and every facility that handles solid waste including compost facilities. It conducts periodic inspections of the County's waste handling facilities, including the WTEF, landfills, transfer stations, and recycling centers. It also conducts investigations of abandoned waste sites and requires the principle responsible party to correct or remediate any contamination resulting from such facilities.

The NMCDF (including the ash monofill) is routinely inspected for compliance with appropriate state and federal regulations. PWES holds the permits to operate this facility and is responsible for monitoring groundwater on a regular basis. PWES, which also owns and operates BI, is responsible for monitoring groundwater at this facility as well.

The specific permit requirements for each solid waste disposal facilities are defined in OAR 340-61. ODEQ reviews and, as appropriate, renews these permits on a ten-year cycle.

- **Air Quality.** ODEQ, through its permitting authority, is responsible for oversight of air monitoring and emissions controls from the WTEF. Covanta, the operator of the facility, provides for continuous monitoring of emissions from the plant as specified in a Title V air contaminant discharge permit. The data is sent to ODEQ, who is responsible for noting violations of air quality standards at the WTEF and assessing fines for non-compliance. U.S. EPA may also assess fines for non-compliance with the Title V permit.

The WTEF must also comply with federal emission requirements for Municipal Solid Waste Incinerators, as well as other design, monitoring, reporting, and compliance testing requirements, as set forth in the Title V permit.

- **Water Quality.** ODEQ issues water quality permits for leachate treatment at NMCDF.
- **Hazardous and Special Wastes.** ODEQ issues permits for facilities that manage hazardous and special wastes. These include construction/demolition landfills. ODEQ conducts regular inspections of these facilities and develops regulations and guidelines for the proper management and disposal of hazardous and special wastes.
- **Illegal dumping.** PWES investigates illegal dumping complaints in Marion County through research and site inspections. It works with property owners to clean up and close illegal dump sites and issues fines as necessary to enforce County regulations.

7.2.3 Financing and Funding Sources

The timely and efficient collection and disposal of solid waste is important to the health and safety of the citizens and businesses in Marion County. PWES manages these services, which are delivered through a combination of public agencies, non-profit organizations and private companies. PWES' responsibilities are to assure satisfactory and effective service and the revenue necessary to fund them. Its mission is to provide the citizens and businesses of Marion County with an environmentally responsible and cost-effective system for reduction and disposal of solid waste, through quality service, education, and public involvement.

Funding Obligations

PWES operates as a public utility through an enterprise fund. It relies on tipping and franchise fees and electricity sales as primary revenue sources for its operations. This approach mandates the understanding of its financial obligations, associated environmental risks, and the need for contingency plans.

The purpose of any utility is to provide uninterrupted service to its customers. PWES assures this ability through three functions. First, it generates the revenue necessary to operate the service system. Second, it provides the capital and reserves required for system improvements. Third, it prepares for contingencies to minimize service interruptions.

The Enterprise Fund

The County's Solid Waste Enterprise Fund is based on tipping fees and sale of energy from the WTEF. The Fund was established in 1987 when the Governmental Accounting Standards Board codified its financial reporting requirements. The code allows revenue collection for special funds. The Enterprise Fund, through revenue growth, may provide internal financing of small capital projects and may be dedicated to repay revenue bonds for large capital projects. The fund's annual revenue requirements are developed through the County budget process. A breakdown of PWES' FY01-02 budget (including revenues and expenditures) is presented in Figure 7-3.

PWES' revenue, following an historical trend, continues to exceed its annual operating expenditures. This difference represents reserve funds provided for future capital projects and as protection against potential environmental liabilities and regulatory changes. However, in recent years growth and expenditures has increased at a faster rate than growth and revenues. This will begin to impact the ability of PWES to make contributions into dedicated reserve funds. PWES conducted a detailed financial analysis in 1999 and is closely monitoring expenditures and revenue in order to maintain stable rates.

The contingency funds are placed into separate dedicated line items representing operating, capital and environmental reserves, recycling grant reserve and an unappropriated fund balance. They ensure that disposal fees remain stable and allow capital projects to be funded without incurring additional debt. Currently the only debt held by the County related to solid waste services is for the

[Insert Figure 7-3.]

WTEF. In FY02-03 the debt service payment is about \$4.3 million. However the debt service for the WTEF will be paid off in FY08-09.

Revenue Sources

PWES' revenue sources are user fees, energy sales generated from the WTEF, sales from material recovery, interest, and franchise fees from the private collection companies (Figure 7-3). The revenue for FY01-02 is approximately \$39.3 million, with 33 percent from disposal fees and 9.5 percent from energy sales. The remaining revenue is reserve funding generated by a balance carryover.

Marion County, through its budget and rate review process, establishes a maximum solid waste disposal charge for its citizens. Private collection companies, which are responsible for billing through their franchise agreements, may charge their clients for services at rates equal to or less than the County's maximums. The cost of services reflects urban or rural locations and types of services offered to clients.

PWES manages the gatehouses at each facility. Private and commercial vehicles are weighed and charged a unit price when they enter any County transfer or disposal site. The current system charge is \$67.45 per ton for commercial companies and County residents.

Expenditures / Facility Operations and Management

This revenue provides the resources for PWES to manage important programs and services including (1) department administration; (2) waste prevention, reuse and recycling; (3) operation of facilities and improvements; and, (4) engineering support and environmental monitoring.

The County operates the gatehouses at the WTEF and at each transfer station. Therefore, PWES is directly responsible for collecting most of the system's revenues. As mentioned, approximately \$21.6 million or 55 percent of PWES' budget in fiscal year 2001-02 (FY01-02) will be spent either directly or indirectly on operations. Of this amount approximately \$1.7 million represents one-time expenditures for capital outlay. Therefore, \$19.9 million is used for direct operations and services in FY01-02 (Figure 7-3).

This may appear to be a relatively small amount of the total solid waste budget on a percentage basis. However, because of bond covenants and potential environmental liabilities associated with closed landfill facilities, a significant amount of funds are placed in dedicated reserve funds.

Each facility that handles solid waste operates under some form of an agreement with the County. These operating agreements forge a cooperative working relationship between the County and the facility operators. Through these operating contracts, PWES and service providers are able to monitor operating performance and make changes to the system as needed. This approach allows the County to respond to rather quickly to changes in the waste stream, new regulations and improvements in technology.

Revenues from operations including interest account for \$18.3 million; the balance of funds needed to meet operations and facility improvements coming from the capital reserve and unappropriated fund balance. Revenues generated from facility operations is slightly less than direct operating expenditures. The difference made up through transfers from reserve to pay for capital improvements.

The contractual relationship between the County and the facilities operators provide a flexible arrangement to enable the system to respond to needed changes. It allows the County to have an appropriate flow control and oversight of system revenues and to monitor facility operations.

Financial Plan and Recommendations

PWES completed a study in 1999 called the “Financial Analysis of Solid Waste Programs and Funding.” This comprehensive study provided specific recommendations on how PWES can maintain a stable enterprise fund. The recommendations follow a set of principles to (1) maintain a stable rate structure; (2) maintain sufficient reserves to minimize debt; and (3) establish post closure funds for County landfills (BI and NMCDF).

The study’s specific recommendations provide important ideas about how Marion County can maintain its solid waste system and prepare for fiscal decisions about its future. The recommendations to PWES include:

1. Establish separate or dedicated capital reserve and environmental contingency funds.
2. Allocate annual interest earnings to the capital reserve and environmental funds
3. Review reserve funds during the annual budget process and make contributions to these funds in order to maintain adequate fund balances.
4. Establish post closure funds for BI and NMCDF Landfills
5. Maintain an operating contingency fund that is equivalent to 20 percent of annual operating expenditures. This includes \$2.5 million as required for by Trust Indenture for the WTEF.
6. Consider a user fee rate for all Marion County wastes.
7. Consider strategies for managing waste that exceeds WTEF capacity.
8. Consider the purchase of environmental insurance for the landfills.

The rationale for these recommendations is important for the County’s consideration of policy decisions about the solid waste system’s future. It’s based on three issues presented in the 1999 study that define financial factors that may impact the system’s stability. They are:

- The solid waste system has a finite capacity. This cap on managing waste flow means that over time, while revenues remain flat, expenditures will exceed them.

- Capital improvements planned over the next decade may exceed \$11 million and require the reserves to pay for them.
- The potential for environmental improvements at BI and NMCDF require reserves to minimize ratepayer risk.

Most of the recommendations from this financial study have been implemented. PWES has established dedicated reserve funds for the purposes stated in the report. The amount of these funds are approaching the recommended funding levels with exception of the capital reserve. It was recommended the capital reserve would need to grow to about \$11 million dollars to pay for improvements needed over the next 10 years. The FY01-02 budget has a capital reserve of \$5,000,000. However, there is time such that PWES can continue to monitor these requirements and make adjustments if needed.

The one area that continues to present a financial risk is the amount of waste that leaves the system without paying for general services. These general services include the waste prevention, reuse and recycling programs, debt service on existing facilities, environmental liabilities resulting from old landfills, and administrative and engineering services required to support the operations of the existing solid waste system. It is estimated that between 15,000 and 20,000 tons leave the system without paying for these basic services. The remaining ratepayers must absorb the difference. This issue will become increasingly problematic as the waste stream grows.

7.3 Needs and Opportunities

The County's solid waste program, throughout its development, has provided important and necessary improvements for its users. These changes reflect population growth and PWES has responded to a corresponding demand for comprehensive services.

PWES' ability to respond is, in part, a function of consistent, thorough updates to its Solid Waste Management Plan. Each update describes historical system improvements and provides information about future program and policy opportunities. The plan, which guides PWES, is a working document that reflects the ever-changing opportunities to provide the best, cost-effective solutions for managing solid waste.

Financing and Funding Considerations

As the County grows, the solid waste management system has changed to reflect new policies and opportunities for service improvements. These changes, which include expanded recycling, composting, remediation, WTEF upgrades and landfill closures require financial resources.

The County's search for resource solutions is not simple. It is, however, based on complex issues that face every jurisdiction that must match increased service demands and the need to pay for them. These issues, capacity, equity and disposal options, are fundamental to the systems future.

The first issue, capacity, is a function of the WTEF. This facility, the County's primary disposal option, has reached its capacity for waste. As a result, each year the amount of waste delivered for landfill disposal grows. The 2010 estimate for non-WTEF waste is almost 90,000 tons (see Table 6-1), representing an increase of about 125 percent from 2001. This excess of MSW beyond the system capacity requires that new disposal options be explored.

Equity is linked to capacity. Today, Marion County charges a system-based fee for all waste delivered to the WTEF or other facilities. The excess waste generated in the County and delivered for landfill disposal outside the County is excluded from the system-based charges. Whereby this excess waste should not pay for facilities it does not use, it should pay for the basic services provided by the County and required by state law. This lack of equity means the system is unbalanced because not every ton of County-generated waste delivers the same revenue.

Finally, the County's capacity cap mandates the study of future disposal options. The WTEF has an operating contract until 2014. If the contract is extended, the operating life of the WTEF will be a function of on-going maintenance and economic viability. The County's estimated population is estimated to grow to 371,135 by 2012. The waste they generated must go to a disposal facility. With certain waste leaving the system makes it more difficult to build the financial resources to meet future demands for system growth.

Management Issues

PWES has established an effective management and administrative system. It works through a series of franchise and operating agreements. The private companies, through these franchise agreements, carry out the basic collection and recycling services. However, franchise agreements are with cities who must buy into the practices and policy direction for managing solid waste.

The SWMAC has been instituted to provide input and guidance to the County and service providers. They continue to play an important role in developing policy for managing solid waste. And, whereas this body represents a broad cross section of citizens and interest groups, it does not, and can not, represent all of the affected parties.

As described in earlier chapters there are several recommendations, which require the participation and buy-in of other constituents. For instance, to expand the recycling collection services, multi-family and commercial customers need to buy-in and support new programs. Also, cities, who are responsible for ensuring recycling services are provided and consistent with the County wide programs, are not active in the formulation of new programs. Thus, there is need to develop a strategy for expanding the input and participation for making decisions.

7.4 Alternatives and Evaluation

The management of solid waste has changed throughout the last 20 years. It has evolved from a primary emphasis on collection and disposal to a complex series of operations based on a specific

environmental hierarchy. These changes require an increased focus on the administration of a growing program that includes waste reduction, reuse programs, recycling, waste-to-energy and disposal facilities. The management must take a long term view to ensure that system charges remain stable.

This section discusses alternatives to improve the County's system management needed to help meet the challenges of implementing the recommendations in the plan.

7.4.1 Administration / Management

PWES is organized to manage each component of the County's solid waste system. It is designed to plan and implement facilities, new waste reduction and recycling programs, and long-term policy. It has an appropriate rate setting process that pays for solid waste services and provides a cash reserve to fund long-term capital improvements such as facility improvements, landfill closures, and remedial action.

Recently, the position of Director of Solid Waste was assigned additional responsibilities to manage the entire public works department. Thus, the Director will now be required to balance time between solid waste and other departments. Whereas, this will dilute the available time of the director, it will also add potential resources for which the director can draw upon.

Originally, Solid Waste was part of the Public Works Department but it was split off in 1989 due to the increased activity needed to build new facilities and implement a comprehensive waste prevention and recycling program. Now that this system has matured, with many of the required programs in place, activities of PWES have evolved into more of a monitoring and maintenance operation. Over the near term this will continue to be the mode of operation.

The current management structure has worked well as evidenced by the substantial gains achieving waste reduction and recycling goals, as well as maintaining stable rates. The system is governed by a series of franchise agreements and direct contracts establishing a formal network of private and public ventures. Through a comprehensive promotion and education program these entities have effectively communicated the program requirements to the general public. Residences and businesses have responded in support of the various programs and services.

In the near future there appears to be no immediate deficiencies with the current management structure. PWES works closely with SWMAC to gain input and direction on programs and services. However, in order to implement some of the recommendations presented in previous chapters, it would be desirable to engage the participation of the cities and other special interests, specifically businesses and owners / managers of multi-family dwellings.

The alternatives to consider center on the role of the SWMAC. One option could be to establish a blue ribbon panel to take on special programs. Members of SWMAC could chair the panel or a subcommittee could be formed. The membership would be expanded to address the specific issue. For instance, in an effort to expand multi-family recycling programs, owners of apartment complexes could be asked to participate in the panel to help develop the solutions. Because the cities are responsible for managing the collection franchises, they too should be contacted to

participate. This would allow the effected parties to participate directly in the program development and their subsequent implementation.

Another option would be to expand SWMAC membership to include representatives from the cities and some of the other entities impacted by new programs. This would be beneficial in that these entities would have the opportunity to participate in policies and programs affecting the entire system. One disadvantage is that the SWMAC already has 22 members, and as it grows larger it becomes more difficult to manage and to develop consensus.

PWES could also set up a separate committee to address specific programs or services. This committee would work fairly independent of the SWMAC to develop options and to make recommendations on preferred approaches. Any recommendation made would be presented to SWMAC for their input and comment prior to presenting a recommendation to the Board of Commissioners. Setting up new committees requires PWES to perform additional administrative and management tasks. This may be less desirable given the recent changes in PWES.

7.4.2 Finance and Funding

PWES' fiscal management of its solid waste system is excellent. It collects fees for services and generates revenue by selling commodities. The enterprise fund provides an operating base and reserve for maintenance, capital improvements and regulatory requirements. As the population grows, however, system demands will affect the County's financial capacity. It's possible that by 2010 PWES will serve 35 percent more citizens than it does in 2001. A fundamental policy issue for the County is how to fund that decade of service growth. The current system has revenue limitations based on material flow and processing capacity. As such, revenues will struggle to keep pace with grow in expenditures without increases in the tipping fees.

Marion County's options for how to fund its system's future include financing it internally, publicly, or through the general fund.

Internal Financing (Pay-as-you-go)

PWES uses internal financing to operate its solid waste system. It's based on a pay-as-you-go cash flow system commonly referred to as "Paygo". This financial system is preferred by public utility since it usually is the least cost to the ratepayers over time. The system relies on establishing capital reserves and other defined contingencies to pay for capital improvements thus avoiding interest expenses associated with debt financing.

PWES, through its fiscal management, has built a reserve fund of about \$20 million. In the 1999 Financial Study these reserve funds were analyzed and determined to be adequate. The report also acknowledged that PWES needed to continue to contribute to these funds to make sure they are adequate to meet future requirements.

While most of the funds balances specified in the report have been met, the Study recommended capital reserve balance should be approximately \$10 million. In the FY2001-02 budget the capital reserve was \$5.0 million. There may be sufficient time to continue to contribute to the capital

reserve in future years to achieve the desired fund balance. This however, must be balanced with an increasing operating expenditures, recognizing that revenue may not grow as fast.

Under this approach PWES would evaluate future revenue requirements and raise tipping fees to generate the necessary funds. PWES has not raised tipping fees since 1992.

Public Financing

The County may, if its growing population requires a change, decide to pay for its system improvements through public financing. This approach, which uses tax-exempt public debt, is a reasonable method to finance large capital projects.

This section is an overview of public financing options available to local governments in Oregon. It includes general obligation and revenue bonds, and reviews pertinent ODEQ and the Oregon Economic Development Department (EDD) programs.

General obligation bonds pledge to the bondholders the full faith and credit of the issuing city or county for the payment of debt service. The source of this credit is the taxing authority of the city or county. All general obligation debt must be approved by a majority of votes in a specific election. The decision to issue general obligation debt should consider the competing, alternative demands on the debt capacity and property tax levels of a municipality. Marion County, with a general obligation debt limit of about approximately \$400 million. Currently the County has no outstanding general obligation bonds (for a non-solid waste project).

Revenue bonds pledge the revenues of a jurisdiction's enterprise activity against the debt service on the issued bonds. They may not require voter approval because they depend upon revenue from the activity rather than the taxing authority of the municipality.

A combination of higher interest rates, coverage requirements, and bond reserves makes revenue bond financing more expensive than general obligation financing. Because these bonds pledge future revenues as collateral for the debt, this form of financing requires a revenue-generating activity whose proceeds can be committed to repayment of the bonds. Through the use of the enterprise fund, PWES can issue revenue bonds for capital intensive projects like the WTEF.

Revenue bonds were a preferred method of financing solid waste system improvements in the past. However, the ability to pledge and guarantee revenues dissipated when flow control laws were challenged and upheld.

Oregon law provides for the creation of the State Pollution Control Bond Fund, administered by ODEQ for the purpose of financing certain pollution control facilities developed by the state and by local governments within Oregon (ORS 468.195-260). This fund is financed through the issue of up to \$260 million in tax exempt bonds by the state. ODEQ may use these bonds for projects related to wastewater treatment and solid waste management facilities. The advantage of selling general obligation or revenue bonds to the State Pollution Control Bond Fund is that it may have a higher bond rating. The result is lower interest costs for the jurisdiction.

To encourage economic development, Oregon issues tax-exempt Oregon Bond Bank Revenue Bonds through the EDD. The EDD uses this money to purchase lower-grade debt from selected communities within the state, which reduces their respective costs. Because the Oregon Bond Bank program is oriented toward the development of new infrastructure, it may be unlikely that bonds issued solely to finance landfill remediation or WTEF improvements would qualify. Bonds issued to develop new landfill capacity, transfer stations, or any other infrastructure of Marion County's solid waste system might qualify for the Bond Bank program. Landfill closure included with other, new infrastructure projects in an issue to fund overall solid waste management system improvements might also qualify for Bond Bank support.

One important advantage of public debt over other methods of financing is that the interest on tax-exempt municipal bonds can be significantly lower than on taxable securities. Tax-exempt bonds have historically had interest rates of 2 to 4 percent below those of comparable taxable bonds. The fixed costs of issuing public debt typically amount to about \$100,000 per issue for revenue bonds, including costs of underwriting, rating, printing and registration. General obligation issues may be less expensive.

General Fund Financing (New Taxes)

General fund financing of the County's solid waste system is an option with limitations. This approach places PWES's budget in a competitive pool with other County programs. It would be developed and approved as part of the overall general fund subject to revenue requirements consistent with the County tax and fee structure. The solid waste activities would compete with other projects for available funds. All system revenues would be directed to the jurisdiction's general fund.

The most common form of tax would make solid waste part of the property tax. Under this approach every unit pays its portion of the solid waste program. Tipping fees can be used to supplement the program revenues. For instance, the property tax portion can be used to pay facility debt service, program management and administration, and for basic waste prevention and recycling education programs. Tipping fees would be collected at facilities for direct services.

This approach would make sure that all constituents pay general services. Therefore, users of the system would not be required to subsidize those generators who elect to haul their waste to facilities outside the system. This would help stabilize tipping fees and possibly delay or prevent increase over a longer period.

The downside to this approach is that adding new taxes is complicated and certainly unpopular. It is much easier to raise tipping fees than to approve new taxes, even if the actual tax is a small percentage of the total property tax.

Generator or User Fees

Another financing approach that has gained support in certain jurisdictions is the establishment of user fees. A simple form of user fees is to require all facilities that service the County to charge this fee. In the case of Marion County, the user fee would include debt for new facilities, cost for

waste prevention and recycling programs, cost to provide environmental controls at closed landfills, and general administration and overhead.

For user fees to be effective they must be collected from all waste generated in the County. This can be accomplished by contracting or by franchising waste services. A preliminary analysis performed as part of the 1999 Financial Study estimated the user fee to be between \$8 and \$10 per ton. The analysis performed as part of the study suggested that if this fee were collected for all waste generated in Marion County, it would allow the County tipping fee to remain at its present level for a longer period. The County has flow control, which could be used to leverage the supply of waste to any facility.

Metro enacted a user fee back in 1983 in order allow all user to pay the same rate. Presently the user fee is \$13.00 per ton.

Another form of user fees is to establish a generator fee. Communities such as Montgomery County, Maryland and Prince William County, Virginia have enacted generator fees. This is fixed charge assessed to different classes of generators. Usually both commercial and residential can be assigned an index based on the amount of waste generated. For residences, the amount of waste is historically fairly well defined. For commercial properties, it can vary based on the type of business. It is necessary to conduct a study to better define the quantities and user classes to assess the generator fee as fairly as possible.

The primary advantage of the user fees is that all generators help pay for the basic services. This keeps the system in balance and reduces dependency on tipping fees. It can be implemented at all solid waste facilities by developing service agreements. With the generator fee approach there is added benefit of achieving a high level of equity among generators because fees are based on actual or imputed levels of generation.

The main disadvantage of the generator fee is that it is often viewed as a tax. Since it is a fixed charge it does not reward directly those that reduce waste or recycle more. There could also be legal challenges to implementing this form of user charge in Oregon.

It could be much easier to implement a user fee collected at all facilities that handle solid waste generated in Marion County. It would be designed similar to Metro's system, which has been in place for many years. Prior to implementing this system, an evaluation of the system charges to be included in the user fee would need to be performed.

7.5 Recommendations

Recommendation 7.1: The County should establish special "blue ribbon" committees comprised of special interest groups, effected parties and/or local jurisdictions to solicit input and assist in developing specific programs related to recommendations in the Updated SWMP.

Rationale for Recommendation: The County has implemented many of the standard programs, as well as some innovative approaches towards achieving a significant increase in the recycling rate.

Several recommendations in Chapter 3 of this plan require the input and buy in from entities that have not been as active in the formation and implementation in these programs. Both the multi-family and commercial recycling programs have the potential for increasing the amount of material recycled in the system. By formulating a special committee to work on the approaches for implementing these programs the County can reach beyond current organization to enlist support for expanding these programs. It is expected that SWMAC will also participate in these special committees.

Recommendation 7.2: The County should complete an in depth evaluation of the funding options to be considered for ensuring that all users of the system are paying the cost of basic programs.

Rationale for Recommendation: As the amount of waste in excess of the WTEF continues to grow potentially more waste will be transported out of County the without paying for waste reduction and recycling programs and support services, debt of the current system and environmental liabilities attributed to existing and closed landfill sites. This will begin to create an additional financial burden on those using the County wide solid waste system and further erode the financial base. There are number of funding options presented in Chapter 7 of the Updated SWMP, each has certain advantages and disadvantages. A more in depth analysis of the issues that confront the County and a more thorough evaluation of the alternatives will provide the information needed for considering implementation of a funding strategy.

Recommendation 7.3: The County should continue to operate solid waste as an enterprise fund and maintain a policy of internal financing. The system should continue to rely on system users paying directly for services and for the enterprise fund to limit future debt.

Rationale for Recommendation: PWES was established by the County as an enterprise fund and has effectively managed resources resulting in rate stability and minimized debt. Contingency and reserve funds have been established following sound financial practice as adopted by other public facilities.

6. WASTE-TO-ENERGY AND SOLID WASTE DISPOSAL

6.1 Background and Existing Conditions

Marion County's solid waste disposal practices are reviewed below. The discussion includes background on the topic of flow control. A description of the Waste-to-Energy Facility (WTEF), which is a significant component of the County's waste management strategy, and other disposal options follows.

6.1.1 Flow Control

Flow control is regulation by the county of where a company can transfer, recycle or dispose of the solid waste it generates. Flow control is important because costs and efficiencies for a waste facility vary based on its waste volume.

Oregon law (ORS 459.125) historically granted flow control to municipalities. This statute was overturned in a 1994 Supreme Court ruling (*C.A. Carbone, Inc. v. Town of Clarkstown*). The Carbone case found flow control to be in violation of the Commerce Clause, which prohibits local governments from interfering with interstate commerce.

Several subsequent cases have allowed flow control in specific situations. Some municipalities have been permitted to continue flow control under grandfather clauses. Local governments have been allowed to continue controlling flow if they demonstrate under "strict scrutiny" that they have no other means to protect local interests. Some municipalities have retained a form of flow control by collecting a user fee from each resident and selecting a company to transfer waste to a preferred facility at reduced rates subsidized by the collected fees.

Marion County is currently granted flow control under a grandfather clause. The legal future of flow control is uncertain, however, and this must be a consideration when planning the management of solid waste.

Flow control is of particular significance in WTEF operation. Disposal at a WTEF is more expensive than traditional landfills (the cost is offset somewhat by the revenue from energy production). Without flow control, companies may be inclined to utilize less expensive landfill disposal options. Reduction in the amount of waste received by the WTEF below a certain level may decrease its power generating efficiency, and result in incrementally higher costs of operation due to lower revenues from energy sales. Concurrently, landfills would reach capacity at a faster rate and increase the burden on the County of siting or locating new facilities.

6.1.2 WTEF Description and Current Status

The WTEF, located on a 16-acre site in Brooks, Oregon (see Figure 2-1 in Chapter 2), was completed in March 1987. The County has a contract with Covanta to deliver a minimum of 145,000 tons of solid waste each year to produce electricity. The WTEF received 184,000 tons of waste in 2000. It is currently operating near its available capacity of 185,000 tons of waste per year.

The facility reduces the volume of waste by 90 percent, which results in reduced amounts of remaining material that is sent to a landfill for disposal. The operating cost for the WTEF is approximately \$66 per ton of garbage. This is offset by revenue from sale of electricity and recovered metal, which is about \$23 per ton. Therefore, the net cost of operating the WTEF is approximately \$43 per ton (Drennen Consulting Services, Inc. 1999).

The facility includes two combustion units rated at 275 tons per day (TPD) each when firing fuel of 4,500 Btu/lb. The system generates superheated steam, which is directed to a turbine rated at 13.1 megawatts. Approximately 11 megawatts of electricity is sold to Portland General Electric Company (PGE) after in-plant needs are met under an agreement that runs through June 30, 2014.

The initial air pollution control system consisted of a reverse air fabric filter baghouse, and semi-dry scrubbers which control SO₂, HCl and other acid gases, and particulates. This facility was the first resource recovery plant in the U.S. to employ the combined dry scrubber/fabric filter air pollution control system in combination.

Marion County has a service agreement with Covanta that extends until 2014, at which time the contract may be extended, changed, or terminated. The County entered into a Second Amended and Restated Agreement for the Supply and Acceptance of Solid Waste (Agreement) in 1984 with Covanta (formerly Ogden Martin Systems of Marion, Inc). The Agreement has been amended six times, most recently in September 1997.

Covanta is responsible, under the agreement, for operation and maintenance of the WTEF, generation of electricity for sale, and processing ash to recover ferrous metals. The County is responsible for running the scalehouse, providing the transport and sale or disposal of recovered ferrous metals, and the transport and disposal of all ash residues. Under the agreement, the County has guaranteed a substantial waste supply to the WTEF, and Covanta has provided certain operating and performance guarantees to Marion County.

Operational history and system performance

The operation and environmental impacts of the WTEF have been monitored since its construction. The WTEF has achieved its objectives of reducing the volume of solid waste, generating electricity, operating in compliance with air pollution criteria and producing non-hazardous ash material.

Covanta conducts four shutdowns (two per boiler) per year for scheduled maintenance, with one combustion unit always on line during maintenance. During these semiannual shutdowns, some MSW is typically diverted to out-of-County landfills.

Compatibility of WTEF with existing system

The County generates approximately 220,000 tons per year (TPY) for disposal and sends about 172,000 TPY of this amount to the WTEF for combustion. The WTEF will continue to serve as a primary component in its waste management system.

The WTEF reduces waste volume by 90 percent, producing electricity in the process. The types and quantities of materials entering the WTEF directly affect its performance and facility planning needs. Certain waste components have a higher heating value (HHV) because they burn better and hotter than others do. It is possible that removal of certain components for recycling could affect the energy output of the WTEF. Research indicates, however, that other jurisdictions with a WTEF and source-separated recycling programs have concluded that the removal of combustibles (paper products) is balanced by the withdrawal of noncombustible or inert material such as metal and glass. Over the past five years the amount of recycled materials has increased by 72 percent. Much of this material includes yard and wood waste, paper and plastics all of which have a higher heating value. However, Covanta reports that the HHV value of 4500 BTU per pound has remained fairly constant during this period. Therefore, recycling more materials has not had an impact on the WTEF operation.

The WTEF, with regular maintenance, can serve the County to 2014 and longer. Typical municipal combustion units, with proper maintenance, may operate for more than 40 years.

Air quality

The facility has met its performance operating requirements each year since 1987. It has a continuous emission monitoring system for CO, O₂, NO_x, SO₂, HCl, and opacity, as well as other standard controls, meters, and monitors, including radiation detection equipment.

The WTEF currently operates under a Clean Air Act Title V permit administered by ODEQ. In May 1998, the air pollution control system was retrofitted with both a nitrogen oxide and mercury control system. This was installed to comply with the 1990 Clean Air Act amendments, the 1995 EPA “maximum achievable control technology (MACT)” standards for large municipal waste combustion units that burn more than 250 tons per day of MSW. The WTEF technology has the ability to adjust its operations to meet regulatory changes and can be retrofitted if more stringent air quality standards are enacted.

6.1.3 WTEF Ash Residue Disposal

Marion County, under its Agreement for Supply and Acceptance of Solid Waste with Covanta, is responsible for transport and disposal of ash produced at the WTEF. Ash is disposed at the NMCDF. NMCDF, which is expected to reach capacity in 2019, is the only solid waste landfill in the County permitted to accept ash.

The NMCDF receives approximately 50,000 tons of ash residue from the WTEF each year. The landfill does not receive any other waste streams. Prior to construction of the WTEF in 1986, it functioned as a sanitary landfill for solid waste from the North County. Until 1996, the facility disposed of small quantities of solid waste that could not be burned at the WTEF. As of 1996, NMCDF no longer accepts solid waste. Marion County, however, maintains a backup landfill cell at NMCDF to dispose of solid waste in case of an emergency.

Marion County owns the site, but it is operated under a contract with Valley Landfills, Inc. Under the contract, Valley Landfill is responsible for operating the landfill (placing, compacting and covering waste) in compliance with all regulatory requirements. Marion County is responsible for leachate disposal and compliance monitoring for both the old landfill and the ash monofill. Tests indicate that the ash is non-hazardous. One ash cell at NMCDF has reached capacity and has been capped and closed. The County's new ash cell (Cell III) includes a double composite liner (two flexible membrane liners and a two-foot-thick clay liner).

In the past, the County spray irrigated collected leachate from the monofill on an adjacent grass field. This form of leachate management was recently terminated by ODEQ due to elevated salt levels in a nearby stream attributed to the spray irrigation drainage. As a result, the County was required to dispose of several million gallons of impounded leachate each year due to the elevated salt levels.

In 2000, Marion County solicited proposals for leachate treatment. A proposal by Foss Environmental to treat the leachate with a vacuum distillation process was selected by a review panel. This process delivers water vapor that is re-condensed into clean distilled water, which will be used to irrigate adjacent County-owned property. The process would leave behind solids and dissolved constituents. The treatment facility was scheduled to open in November 2001, however is somewhat behind schedule. Marion County owns the equipment and has a five-year contract with Foss. When it expires, the County may choose to renew the contract, renegotiate with another company, or operate the facility themselves.

6.1.4 Other Waste for Landfill Disposal

Although the majority of MSW generated in Marion County is received at the WTEF, some waste is diverted to in-County and out-of-County landfills (Figure 6-1 and Figure 2-1 in Chapter 2 show locations of in-County and out-of-County landfills). This includes

[Insert Figure 6-1.]

three general categories of waste: 1) waste that cannot be incinerated (non-combustible); 2) bypass waste during times that the WTEF is shut down for maintenance; and 3) waste generated in excess of the WTEF capacity. Marion County generated over 55,000 tons of waste in these categories for landfill disposal in 2000.

Municipal solid waste

Coffin Butte Landfill receives waste directly from collection companies. The County has an informal agreement with these companies to deliver MSW to Coffin Butte when the WTEF is operating at capacity or is offline. Coffin Butte also receives residual waste from the MRRF.

Construction and demolition (C&D) debris

Typical C&D materials may include: ashes, asphalt shingles, concrete, fiberglass, bricks, dirt, plaster, rock, tile, vinyl flooring, visqueen, window glass, asbestos and styrofoam insulation. This type of inert material is disposed of at the BI south of Salem (see Figure 2-1 in Chapter 2 for location). Other construction debris, which may include items such as wood waste, metal scraps and plastics, is recycled through MRRF.

6.2 Waste Stream Projections

6.2.1 Waste Disposal Projections

Waste stream projections were calculated through 2019 to determine the County's disposal needs (Table 6-1 through Table 6-4). U.S. Census figures reported that Marion County's 2000 population was 284,834. Population in Marion County increased 2.23 percent per year between 1990 and 2000, and population projections for 2001 through 2019 are calculated using this annual rate of increase. Projections of waste generated were calculated using population projections and an estimated per capita waste generation rate of 2,495 pounds per year.

National research indicates that per capita rates of waste generation increase over time. Marion County's per capita waste generation figures from 1998 to 2000 did not increase. Waste generated per capita was 2,510 pounds/year in 1998, 2,440 pounds/year in 1999, and 2,495 pounds/year in 2000. This data supports the approach of using a constant per capita waste generation rate for the 20-year period.

Although the recycling rate grew at almost six times that of waste generated, the amount of waste disposed continued to increase due to population growth. The amount of materials recycled in Marion County has increased from 103,299 tons in 1998 to 133,277 tons in 2000 (see Table 2-5 in Chapter 2). This represents a 29 percent increase or a growth rate of 13.5 percent per year. Over the same period, the amount of waste generated increased by 5 percent (2 percent per year) due to population increases. The actual amount of waste disposal decreased from 1998 to 2000 due to recycling, but projections indicate that it will increase in 2001 and thereafter (recycling and reduction in per capita waste generation will not be able to keep pace with population growth).

Projections were developed using four waste stream alternatives, each with different assumptions for recycling rates and disposal. They include:

- Table 6-1 assumes that the current recycling rate (38 percent) remains constant throughout the 20-year period.
- Table 6-2 assumes that the recycling rate will increase gradually to 44 percent in 2009 and remain constant until 2019. This alternative is expected to meet the state recovery goal of 54 percent for Marion County by 2009 (The recovery goal is equal to the recycling goal plus the 6 percent waste prevention credit. An additional 4 to 6 percent recycling credit is expected to be included for incinerated wood material).
- Tables 6-3 through 6-4 reflect the most conservative recycling rate, 38 percent throughout the 20-year period. This assumption is the same as that in Table 6-1. These tables include, however, the possible closure of the WTEF in 2015 (Table 6-3), and both the WTEF in 2015 and BI facility in 2011 (Table 6-4).

The tables indicate significant differences in the total MSW that may be delivered for landfill disposal by 2019. Each alternative indicates that a substantial volume of MSW will require disposal by 2019. The volume is greatest under the last alternative in which the WTEF and BI facility are closed.

Assuming the WTEF remains operational throughout the 20-year period, under the 38 percent recycling alternative (Table 6-1, Cumulative MSW to be Landfilled), over 1.3 million tons of waste will require disposal in excess of the WTEF and BI, compared to 0.9 million tons under the 44 percent recycling alternative (Table 6-2, Cumulative MSW to be Landfilled). This waste is currently disposed of at Coffin Butte and Riverbend landfills; however, these facilities do not have sufficient capacity to accept all projected waste.

A 44 percent recycling rate means that approximately 400,000 fewer tons will be delivered for landfill disposal in the 20 years than if the recycling goal remains at 38 percent. The amount of MSW requiring landfill disposal increases under the last two alternatives. Assuming a 38 percent recycling rate and the closure of the WTEF (Table 6-3), 2.6 million tons will require landfill disposal by 2019. The alternative in which both the WTEF and BI landfill are closed (Table 6-4) increases that total to 2.8 million tons.

These alternatives demonstrate the importance of disposal options for Marion County. The county's growth rate over twenty years will exceed its disposal capacity unless it considers expanding the WTEF, building a landfill, or purchasing capacity at local or regional landfills. These options may not provide exclusive solutions for the county's growth. A best management approach for disposal may be to combine more WTEF capacity with multiple landfill contracts and a realistic recycling rate.

**Table 6-1
Waste Stream Projections – 38 percent Recycling Rate**

Year	Population ¹	Waste Generated (tons) ²	Waste Recycled (tons)	Recycling Rate	Waste Disposed (tons)	Waste to WTEF (tons)	Waste to BI (tons) ³	MSW to be Landfilled (tons) ⁴	Cumulative MSW to be Landfilled (tons) ⁵
1998	271,900	337,099	103,299	31%	233,800	176,763	23,678	33,359	
1999	278,671	342,828	108,088	32%	234,740	174,035	19,490	41,215	
2000	284,834	355,375	133,277	38%	222,098	170,950	15,069	36,079	
2001	291,186	363,254	138,037	38%	225,218	185,000	19,685	20,532	
2002	297,679	371,355	141,115	38%	230,240	185,000	19,784	25,456	25,456
2003	304,317	379,636	144,262	38%	235,374	185,000	19,883	30,492	55,948
2004	311,104	388,102	147,479	38%	240,623	185,000	19,982	35,641	91,589
2005	318,041	396,757	150,768	38%	245,989	185,000	20,082	40,907	132,496
2006	325,134	405,604	154,130	38%	251,475	185,000	20,182	46,292	178,788
2007	332,384	414,649	157,567	38%	257,083	185,000	20,283	51,799	230,587
2008	339,796	423,896	161,080	38%	262,815	185,000	20,385	57,431	288,018
2009	347,374	433,349	164,673	38%	268,676	185,000	20,487	63,190	351,208
2010	355,120	443,013	168,345	38%	274,668	185,000	20,589	69,079	420,286
2011	363,039	452,892	172,099	38%	280,793	185,000	20,692	75,101	495,387
2012	371,135	462,991	175,937	38%	287,055	185,000	20,796	81,259	576,646
2013	379,412	473,316	179,860	38%	293,456	185,000	20,900	87,556	664,202
2014	387,872	483,871	183,871	38%	300,000	185,000	21,004	93,996	758,198
2015	396,522	494,661	187,971	38%	306,690	185,000	21,109	100,581	858,779
2016	405,364	505,692	192,163	38%	313,529	185,000	21,215	107,314	966,093
2017	414,404	516,969	196,448	38%	320,521	185,000	21,321	114,200	1,080,294
2018	423,645	528,497	200,829	38%	327,668	185,000	21,427	121,241	1,201,535
2019	433,093	540,283	205,308	38%	334,975	185,000	21,534	128,441	1,329,976

¹Marion County's population was 228,500 in 1990; population increased 2.23 percent per year between 1990 and 2000. Population is calculated in this table by projecting an annual population increase of 2.23 percent on the 2000 U.S. Census Bureau population figure of 284,834.

²Projected waste generated between 2001 and 2019 was based on an estimate of 2,495 lb per capita (the 2000 waste generation rate).

³Projected waste disposed at BI is calculated based on a 0.5 percent annual increase from 1999 levels.

⁴This is MSW requiring disposed in excess of WTEF and BI; these wastes are currently disposed at Coffin Butte and Riverbend landfills.

⁵Cummulative MSW is the total waste requiring disposal over the 20-year projection, in excess of that disposed at WTEF and BI.

Table 6-2
Waste Stream Projections – 38 percent Recycling Rate to 44 percent Recycling Rate in 2009

Year	Population ¹	Waste Generated (tons) ²	Waste Recycled (tons)	Recycling Rate	Waste Disposed (tons)	Waste to WTEF (tons)	Waste to BI (tons) ³	MSW to be Landfilled (tons) ⁴	Cumulative MSW to be Landfilled (tons) ⁵
1998	271,900	337,099	103,299	31%	233,800	176,763	23,678	33,359	
1999	278,671	342,828	108,088	32%	234,740	174,035	19,490	41,215	
2000	284,834	355,375	133,277	38%	222,098	170,950	15,069	36,079	
2001	291,186	363,254	138,654	38%	224,601	185,000	19,685	19,915	
2002	297,679	371,355	144,221	39%	227,133	185,000	19,784	22,350	22,350
2003	304,317	379,636	149,968	40%	229,668	185,000	19,883	24,785	47,135
2004	311,104	388,102	155,900	40%	232,202	185,000	19,982	27,220	74,354
2005	318,041	396,757	162,022	41%	234,735	185,000	20,082	29,653	104,007
2006	325,134	405,604	168,339	42%	237,266	185,000	20,182	32,083	136,090
2007	332,384	414,649	174,857	42%	239,792	185,000	20,283	34,509	170,599
2008	339,796	423,896	181,582	43%	242,314	185,000	20,385	36,929	207,528
2009	347,374	433,349	188,521	44%	244,828	185,000	20,487	39,341	246,870
2010	355,120	443,013	194,926	44%	248,087	185,000	20,589	42,498	289,367
2011	363,039	452,892	199,272	44%	253,619	185,000	20,692	47,927	337,295
2012	371,135	462,991	203,716	44%	259,275	185,000	20,796	53,479	390,774
2013	379,412	473,316	208,259	44%	265,057	185,000	20,900	59,157	449,931
2014	387,872	483,871	212,903	44%	270,968	185,000	21,004	64,964	514,895
2015	396,522	494,661	217,651	44%	277,010	185,000	21,109	70,901	585,796
2016	405,364	505,692	222,505	44%	283,188	185,000	21,215	76,973	662,769
2017	414,404	516,969	227,466	44%	289,503	185,000	21,321	83,182	745,951
2018	423,645	528,497	232,539	44%	295,959	185,000	21,427	89,531	835,482
2019	433,093	540,283	237,724	44%	302,558	185,000	21,534	96,024	931,507

¹Marion County's population was 228,500 in 1990; population increased 2.23 percent per year between 1990 and 2000. Population is calculated in this table by projecting an annual population increase of 2.23 percent on the 2000 U.S. Census Bureau population figure of 284,834.

²Projected waste generated between 2001 and 2019 was based on an estimate of 2,495 lb per capita (the 2000 waste generation rate).

³Projected waste disposed at BI is calculated based on a 0.5 percent annual increase from 1999 levels.

⁴This is MSW requiring disposed in excess of WTEF and BI; these wastes are currently disposed at Coffin Butte and Riverbend landfills.

⁵Cummulative MSW is the total waste requiring disposal over the 20 year projection, in excess of that disposed at WTEF and BI.

**Table 6-3
Waste Stream Projections – 38 percent Recycling Rate, WTEF Closing in 2015**

Year	Population ¹	Waste Generated (tons) ²	Waste Recycled (tons)	Recycling Rate	Waste Disposed (tons)	Waste to WTEF (tons)	Waste to BI (tons) ³	MSW to be Landfilled (tons) ⁴	Cumulative MSW to be Landfilled (tons) ⁵
1998	271,900	337,099	103,299	31%	233,800	176,763	23,678	33,359	
1999	278,671	342,828	108,088	32%	234,740	174,035	19,490	41,215	
2000	284,834	355,375	133,277	38%	222,098	170,950	15,069	36,079	
2001	291,186	363,254	138,037	38%	225,218	185,000	19,685	20,532	
2002	297,679	371,355	141,115	38%	230,240	185,000	19,784	25,456	25,456
2003	304,317	379,636	144,262	38%	235,374	185,000	19,883	30,492	55,948
2004	311,104	388,102	147,479	38%	240,623	185,000	19,982	35,641	91,589
2005	318,041	396,757	150,768	38%	245,989	185,000	20,082	40,907	132,496
2006	325,134	405,604	154,130	38%	251,475	185,000	20,182	46,292	178,788
2007	332,384	414,649	157,567	38%	257,083	185,000	20,283	51,799	230,587
2008	339,796	423,896	161,080	38%	262,815	185,000	20,385	57,431	288,018
2009	347,374	433,349	164,673	38%	268,676	185,000	20,487	63,190	351,208
2010	355,120	443,013	168,345	38%	274,668	185,000	20,589	69,079	420,286
2011	363,039	452,892	172,099	38%	280,793	185,000	20,692	75,101	495,387
2012	371,135	462,991	175,937	38%	287,055	185,000	20,796	81,259	576,646
2013	379,412	473,316	179,860	38%	293,456	185,000	20,900	87,556	664,202
2014	387,872	483,871	183,871	38%	300,000	185,000	21,004	93,996	758,198
2015	396,522	494,661	187,971	38%	306,690		21,109	285,581	1,043,779
2016	405,364	505,692	192,163	38%	313,529		21,215	292,314	1,336,093
2017	414,404	516,969	196,448	38%	320,521		21,321	299,200	1,635,294
2018	423,645	528,497	200,829	38%	327,668		21,427	306,241	1,941,535
2019	433,093	540,283	205,308	38%	334,975		21,534	313,441	2,254,976

¹Marion County's population was 228,500 in 1990; population increased 2.23 percent per year between 1990 and 2000. Population is calculated in this table by projecting an annual population increase of 2.23 percent on the 2000 U.S. Census Bureau population figure of 284,834.

²Projected waste generated between 2001 and 2019 was based on an estimate of 2,495 lb per capita (the 2000 waste generation rate).

³Projected waste disposed at BI is calculated based on a 0.5 percent annual increase from 1999 levels.

⁴This is MSW requiring disposed in excess of WTEF and BI; these wastes are currently disposed at Coffin Butte and Riverbend landfills.

⁵Cummulative MSW is the total waste requiring disposal over the 20 year projection, in excess of that disposed at WTEF and BI.

**Table 6-4
Waste Stream Projections – 38 percent Recycling Rate, WTEF Closing in 2015, Brown’s Island Closing in 2011**

Year	Population ¹	Waste Generated (tons) ²	Waste Recycled (tons)	Recycling Rate	Waste Disposed (tons)	Waste to WTEF (tons)	Waste to BI (tons) ³	MSW to be Landfilled (tons) ⁴	Cumulative MSW to be Landfilled (tons) ⁵
1998	271,900	337,099	103,299	31%	233,800	176,763	23,678	33,359	
1999	278,671	342,828	108,088	32%	234,740	174,035	19,490	41,215	
2000	284,834	355,375	133,277	38%	222,098	170,950	15,069	36,079	
2001	291,186	363,254	138,037	38%	225,218	185,000	19,685	20,532	
2002	297,679	371,355	141,115	38%	230,240	185,000	19,784	25,456	25,456
2003	304,317	379,636	144,262	38%	235,374	185,000	19,883	30,492	55,948
2004	311,104	388,102	147,479	38%	240,623	185,000	19,982	35,641	91,589
2005	318,041	396,757	150,768	38%	245,989	185,000	20,082	40,907	132,496
2006	325,134	405,604	154,130	38%	251,475	185,000	20,182	46,292	178,788
2007	332,384	414,649	157,567	38%	257,083	185,000	20,283	51,799	230,587
2008	339,796	423,896	161,080	38%	262,815	185,000	20,385	57,431	288,018
2009	347,374	433,349	164,673	38%	268,676	185,000	20,487	63,190	351,208
2010	355,120	443,013	168,345	38%	274,668	185,000	20,589	69,079	420,286
2011	363,039	452,892	172,099	38%	280,793	185,000		95,793	516,079
2012	371,135	462,991	175,937	38%	287,055	185,000		102,055	618,134
2013	379,412	473,316	179,860	38%	293,456	185,000		108,456	726,589
2014	387,872	483,871	183,871	38%	300,000	185,000		115,000	841,589
2015	396,522	494,661	187,971	38%	306,690			306,690	1,148,279
2016	405,364	505,692	192,163	38%	313,529			313,529	1,461,808
2017	414,404	516,969	196,448	38%	320,521			320,521	1,782,329
2018	423,645	528,497	200,829	38%	327,668			327,668	2,109,997
2019	433,093	540,283	205,308	38%	334,975			334,975	2,444,973

¹Marion County's population was 228,500 in 1990; population increased 2.23 percent per year between 1990 and 2000. Population is calculated in this table by projecting an annual population increase of 2.23 percent on the 2000 U.S. Census Bureau population figure of 284,834.

²Projected waste generated between 2001 and 2019 was based on an estimate of 2,495 lb per capita (the 2000 waste generation rate).

³Projected waste disposed at BI is calculated based on a 0.5 percent annual increase from 1999 levels.

⁴This is MSW requiring disposed in excess of WTEF and BI; these wastes are currently disposed at Coffin Butte and Riverbend landfills.

⁵Cumulative MSW is the total waste requiring disposal over the 20-year projection, in excess of that disposed at WTEF and BI.

6.3 Needs and Opportunities

Waste prevention and recycling are important components of Marion County's solid waste management strategy. These activities, which define elements within a larger strategy of avoided disposal costs, also control the growth of MSW. The value of these components is how they serve as part of a comprehensive strategy for managing the county's waste. These programs alone, however, will not solve the need to provide innovative options for the demands of a growing population in Marion County. This Updated SWMP examines short and long-term strategies for managing a growing County waste stream.

The population estimates for Marion County's growth includes an increase in landfill disposal from almost 40,000 tons per year (TPY) in 2001 to 115,000 TPY in 2014 (Table 6-1). Marion County, to meet Oregon's environmental priorities, has developed a management system that minimizes the landfill disposal of MSW. The WTEF, which opened in 1987, has served to meet the county's primary disposal needs. A possible closure of the WTEF in 2015 will create a demand for over 300,000 TPY of landfill capacity. As the amount of waste in excess of the WTEF grows, there will be a corresponding demand for more efficient transportation of MSW. It may also be important to develop a long-term arrangement with a local or regional landfill to ensure that Marion County has adequate disposal capacity.

Today, MSW in excess of the WTEF is typically delivered to the Coffin Butte Landfill. An informal arrangement with local franchise collection companies sends the waste to this site. The companies may send MSW to Coffin Butte as long as a sufficient material flow is delivered to the WTEF. This informal system, however, should be reviewed by the County as it considers new management options. Those companies that send their waste to the WTEF may subsidize the MSW delivered to Coffin Butte. Marion County's rates are set to fund waste reduction and recycling programs that benefit all constituents. When private collection companies or individuals go directly to Coffin Butte they avoid paying for these programs. For these reasons, the informal system currently in place may need to be replaced with a more formal agreement with these companies.

6.4 Alternatives and Evaluation

This alternatives and evaluation discussion considers the needs and issues raised in the previous sections. Alternatives for handling the major waste streams include MSW, ash residue and construction /demolition debris. These alternatives are discussed and evaluated in terms of their ability to meet the goals and objectives developed by the SWMAC (see Chapter 1).

6.4.1 Alternatives for Municipal Solid Waste (MSW) Disposal

Marion County is projected to have a minimum of almost one million tons of MSW for disposal in excess of the capacity of the WTEF and BI from 2001 to 2019 (assuming recycling rates increase as depicted in Table 6-2). The amount could grow to as much as 2.4 million tons if the WTEF closes after 2014 and BI closes in 2010 (worst case scenario depicted in Table 2-5). For the next nine years, however, the amount in excess of the WTEF, is less than 100,000 tons per year (Table 6-4). As a result, there is insufficient MSW from Marion County to consider developing a new in-county landfill or to expanding the WTEF in the short term.

The Updated SWMP will focus on the near term solutions as it considers long-term policy alternatives. Possible solutions include disposing at existing local landfills, siting a new in-County landfill, exporting waste to a regional landfill, and extending the WTEF operating contract.

MSW disposal at local landfills

Two MSW landfills, Coffin Butte and Riverbend, operate within a 30-mile radius of Marion County (Figures 6-1). Each landfill has received MSW from Marion County, although Riverbend in much lower amounts.

Coffin Butte Landfill

Coffin Butte Landfill, located near Corvallis in Benton County, has served as backup to the WTEF since 1987. Located less than 20 miles from the County line, this landfill also receives waste in excess of the WTEF capacity. The landfill has the capacity for 100,000 TPY generated in excess of the WTEF for at least the next 25 years.

Coffin Butte Landfill was recently purchased by Allied Waste Systems, which is the second largest waste management company in the United States. The County has no formal agreement with Coffin Butte. Coffin Butte charges \$20 per ton for disposal. The landfill, formerly regulated by Benton County for disposal rates, now has the ability to negotiate a contract rate based on volume. The price for transporting waste to Coffin Butte is less than \$10 per ton.

Riverbend Landfill

Located in Yamhill County, this MSW landfill is operated by Waste Management of Oregon. In addition to Yamhill County, the facility serves as a regional disposal site for several communities in northwest Oregon, including counties on the coast and Columbia County.

The landfill, approximately 30 miles from Marion County, has an estimated remaining capacity of 15 years. ODEQ reported that about 4,000 tons of MSW from Marion County was disposed at the landfill in 1998 and 1999. Its unregulated disposal rates are \$20 to \$22 per ton. Transportation costs to Riverbend are similar to those for Coffin Butte.

There are important advantages to using one or both of these landfills as a disposal site for waste in excess of, and as backup to, the WTEF. First, each facility has sufficient capacity to dispose of the county's excess waste in the near term (5-10 years). Second, they are near the County and the cost to transport waste is reasonable. Third, each landfill is willing to discuss a service agreement with Marion County to guarantee available capacity. To date, almost all excess waste has been disposed of at Coffin Butte because it is closer to where waste is generated in the County.

The disadvantage may be that the landfills are too convenient. Many self-haulers, including contractors with construction debris, transport their own waste to the Coffin Butte landfill. They escape the franchise collection companies and avoid paying for general services such as waste reduction and recycling. Users of the Marion County system are then forced to pay more on unit cost basis to pay for these programs. And, if this is C&D type waste as reported, there is no potential to recover and recycle certain materials. In order to address these issues and ensure there will be sufficient capacity available, the County should consider a short term (5-10 years) contract with one or both of these landfills. The County can use its flow control authority to require that all the waste is processed for recovery and that sufficient waste is delivered to the WTEF facility. In return, the out of county landfill can provide a set fee and also collect appropriate fees to pay for the County services.

Site a new in-County landfill

It may be feasible to locate and operate a new solid waste landfill in the County. The new landfill would be designed to meet subtitle D regulations and dispose of more than 100,000 tons per year starting in FY10. The assumptions made for this option require the County to sign a short-term contract with Coffin Butte Landfill. The County would begin to collect a uniform rate on all waste disposed from Marion County. PWES would conduct a siting study beginning in FY04. The effort to site, permit, and construct the first cell may require five years. As part of the uniform rates, PWES would collect revenue to help pay the capital cost of the new landfill. The estimated total tipping fee for a new landfill could range from \$30 to \$40 per ton (assumes 100,000 TPY), which is considerably more than the current cost to dispose at Coffin Butte or at landfills located in the Columbia River Gorge. Transportation costs, however, would be less.

Although this alternative is feasible, the County must consider the difficulties of locating a new municipal solid waste landfill. With existing capacity available both locally and in eastern Oregon and Washington, few communities have engaged in efforts to site new landfills. As more waste in excess of the WTEF capacity is generated, a new in-County landfill may be an option to consider.

In order for a new landfill to be relatively cost effective, a sufficient amount of waste is needed. The analysis presented in the SWMP shows that about 100,000 tons per year may be needed to remain competitive with other alternatives. This amount of waste in excess of the WTEF is projected to be about 100,000 TPY in 2008, assuming the recovery rate remains constant. If the recovery rate increases to 44 percent or more, this amount of

waste will not be available until 2011. Even under these conditions, it will be important to have more waste to pay for the new landfill.

Construction of a bioreactor landfill

Another option is the construction of a bioreactor landfill facility. This could increase cost-effectiveness by minimizing space required for disposal (wastes would be continually degraded) and offering a byproduct of electricity generated from methane emissions.

Conventional landfills attempt to maintain MSW in dry conditions in order to keep the biodegradable portion of deposited wastes from breaking down. Wastes will decompose eventually, at a slower rate after landfills are closed, and problems may arise due to leachate and gas emission issues.

Bioreactor landfills differ in that decomposition is encouraged at the beginning of the life of the landfill. This result is a source of energy that can be harvested. In bioreactors, liquid is added and leachate may be recirculated in order to increase decomposition of wastes. Decomposition can occur aerobically (in the presence of oxygen) and/or anaerobically (without oxygen present). Gases, primarily methane and carbon dioxide, are generated as byproducts of the decomposition process. After dewatering, these gases can be used directly in reciprocating engines. Gases can also be further processed by removing sulfur dioxide and carbon dioxide. This results in higher-BTU gases that can be used in gas turbines to generate electricity.

A bioreactor landfill may be suitable for Marion County for several reasons. It was estimated in 1998, that 80 percent of Marion County's wastes are potentially biodegradable. Another advantage is that leachate and gas products generated in decomposition are managed in a more controlled manner. Gases are harvested, rather than being released to the environment. Collection of methane gas is of particular interest, because methane is a potent greenhouse gas, and it is readily converted to usable energy. Because the byproducts are released when the facility is newer, there also may be fewer problems with unwanted leakage or emissions than could occur in aging facilities. In bioreactors, landfill space would also become available sooner. Because bioreactors would be more stable upon closure, efforts and costs of monitoring landfills may be reduced. Alternative uses of landfill, such as park space, may also occur earlier in time.

A bioreactor landfill is currently being used in California. In 1995, 56 landfill facilities were utilizing gas recovery, and 42 of these were producing electricity (California Energy Commission 1998). The use of bioreactor technology is a recent trend, and data are still being collected on their operation. A bioreactor research facility is being studied in Yolo County California (Yolo County, California 2001; Florida Center for Solid and Hazardous Waste Management 1998). The site contains paired landfill cells: one is operated as a conventional landfill, and the other is operated as an anaerobic bioreactor with recirculating leachate. Upon completion, the study will allow for a direct comparison of waste decomposition time between the two methods.

Bioreactors are a recent technology and research is needed in areas such as the degradation of organic and inorganic toxins, control of landfill gas emissions, and leachate recirculation. Although the technology is still being studied, bioreactors may be a more efficient solution than traditional landfills. The level of effort to site and cost to build such a facility, however, is similar to that of a new MSW landfill.

Export waste to regional sites

Today, none of the County's MSW is delivered to regional landfills. Due to transportation and other potential costs for transfer facilities, regional disposal is an expensive option. The cost to transport and dispose of waste at these facilities could range from \$35 to \$45 a ton. This does not include the cost to operate a local transfer station and to load trailers for delivery. The cost to operate and maintain a transfer station would add \$6 to \$12 per ton, making the total cost about \$41 to \$57 per ton. This may compare favorably when considering the costs and time required to site and permit a new in-County landfill.

Waste disposal in larger, regional landfills in eastern Oregon and Washington is common. There are several regional landfills (within 200 to 300 miles) that could meet Marion County's disposal needs (Figure 6-1). These are:

- Columbia Ridge Landfill in Arlington, Oregon
- Roosevelt Landfill in Roosevelt, Washington
- Finley Buttes Landfill in Boardman, Oregon
- Northern Wasco Landfill in Wasco County, Oregon
- Dry Creek Landfill in Medford, Oregon

Many smaller communities throughout Oregon and Washington rely on these large regional landfills because they do not generate sufficient quantities of MSW to build a local facility.

Today, there is sufficient landfill capacity for the County's MSW waste stream for many years. The decision to transport this waste involves two issues. The first issue relates to whether the County supports shipping its waste to another county and relying on other jurisdictions, or whether it prefers to handle its' own waste. The second issue relates to the cost to transport waste, usually by train or truck. Communities that have justified the additional costs have taken different approaches to transporting waste based on their location and access to services. Vancouver, Washington's waste is barged to Finley Buttes Landfill in eastern Oregon, while waste from the Puget Sound area is rail-hauled to eastern Oregon and Washington landfills.

Continue operation of the WTEF

The WTEF contract expires in 2014. At that time, the County will have three options: 1) discontinue operations of the WTEF; 2) renew the county contract and continue operations assuming that costs remain reasonable; and 3) continue operations of the WTEF under a franchise system with no contractual obligations.

If the WTEF is closed, the County must secure disposal options for 185,000 tons of waste per year. As shown in Tables 6-4, the amount of waste to be disposed will be over 300,000 TYP in 2015. This amount of waste will require the County to site a new landfill or negotiate for a long-term contract with a regional site, assuming that neither of the nearby out of county landfills could handle this amount of waste for any length of time.

Prior to closing the WTEF, the County could undertake an evaluation of the cost and environmental impacts of continuing this operation. Such an analysis could compare the environmental benefits of operating a solid waste system with the WTEF as a primary component to a system that relies on long haul transportation and disposal. It could also consider the price of energy to assess the viability of continuing with the WTEF.

Flow control, as discussed, is a variable factor and should be evaluated when determining future solid waste management plans. The WTEF must maintain a minimum volume of waste input to operate efficiently, and if flow control issues conflict with this requirement, the WTEF may become less cost effective. It is premature to make any decision regarding the continued operation of the WTEF after 2014. Any analysis performed at this time would be out of date.

Waste stream projections indicate that capacity of the WTEF will be exceeded before the contract expires in 2014. One option for managing increased waste loads is to expand the current WTEF capacity by constructing a third burner.

Construct a third burner

The WTEF was designed and constructed for the installation of a third boiler. As the waste stream grows, some of the waste generated could be managed by adding capacity at the WTEF. This would increase the WTEF capacity from 185,000 to 277,500 TPY.

The total waste generated currently exceeds 277,500 tons per year, however a significant portion of it is recycled. The County could not fully supply a third burner with in-county waste until 2011 or 2016, depending on the amount of recycling realized (see Tables 6-1 through 6-2). Construction of a burner before it's necessary may create some disincentive to increasing recycling levels.

The cost of adding a third burner was evaluated in 1995. However, at the time it was not cost effective and the supply of waste was not sufficient. Energy prices at the time were closer to \$0.024 per Kwh. Currently, the energy from the WTEF is sold at \$0.055 to \$0.060 per Kwh. Any consideration to expand the WTEF should include an evaluation of the current market conditions.

6.4.2 WTEF Ash Residue Disposal

The WTEF will be a component in Marion County's solid waste management system to at least 2014. The NMCDF has sufficient capacity to dispose of ash residue until 2019, which exceeds the time frame of the operating contract for the plant. As discussed in section 6.2.3, the County has an effective ash management and leachate treatment system with the appropriate capacity. As an alternative to disposing of ash at NMCDF, the utilization could also be investigated.

Utilization of Ash Residue/Reuse

Waste-to-energy facilities and their evolving technologies have been operating in the United States for twenty years. During this period, there have been many studies related to re-using ash residue. The research in ash reuse relates to what happens when the ash comes in contact with water and whether certain materials such as heavy metals or other constituents, which could be harmful to humans or the environment, leach out. Recent studies indicate that this is not the case, and, as a result, many states are considering new practices for managing ash residue.

Ash residue is a potential resource for the production of glass, construction materials, or cover material. There are several technologies for ash treatment including vitrification, fixation, and chemical stabilization (Valenti 1999). Vitrification occurs when ash is heated above 2400°F and transformed into an inert, glass-like substance. In fixation, heavy metals in fly ash are adsorbed into activated carbon. Stabilization is more cost-effective and is the most widely used technique of ash utilization. In stabilization, the ash is chemically treated to produce an inert material that can be used for cover or fill.

Several states are beginning to find alternatives to landfilling of ash. A pilot program in Minnesota uses WTEF ash residue for road base material (Lucido and Wilson 2001). Nine facilities in the state are participating in the study, in which a road test strip is under evaluation. In Honolulu, Hawaii, a feasibility study was conducted on the use of WTEF ash as road construction aggregate and intermediate and daily landfill cover (Jones et al. 1999). The study was unique in that both fly and bottom ash were used. Preliminary results indicated that ash is a potentially viable material for these uses. Health risk assessments performed in the study indicated that cancer and respiratory risks were insignificant. Florida recently issued new policies and practices for reusing ash (Yon 2001). The new program requires the preparation of Beneficial Use Demonstrations (BUDs) which show that the intended ash utilization program does not create risks for human or environmental health and that the ash is chemically and physically similar to the material (i.e. paving material) that is being replaced. One component of the BUD is a sampling plan demonstrating that the material is not hazardous.

Marion County is interested in ash reuse options that are cost-effective, environmentally safe and appropriate for approval by the ODEQ. The County could consider a program to evaluate ash utilization similar to the one that the state of Florida has implemented.

6.5 Recommendations

The following recommendations provide Marion County with a set of actions for managing the MSW and ash disposal.

6.5.1 Municipal Solid Waste (MSW)

Recommendation 6.1: The County should develop a service agreement with local landfills to ensure adequate capacity of MSW for the next 10 years. The agreement should include provisions that Marion County will deliver or cause to deliver MSW in excess of the WTEF capacity for a certain timeframe. The County should request the local landfill collect appropriate fees from customers whose waste is generated in Marion County.

Rationale for Recommendation: Currently, PWES informs certain franchised collection companies that the WTEF is operating at capacity and instructs them to haul directly to Coffin Butte Landfill. This system has worked to date. As waste quantities increase there will be a need to not only develop a cost efficient transportation system but to ensure all waste leaving the County pays the same rate. Also, by formalizing an agreement with the landfill it will provide certainty there is adequate capacity to meet the long-term needs of the County.

Recommendation 6.2: The County should continue to preserve a back up MSW landfill cell at NMCDF. This cell provides added insurance if the WTEF were not able to accept MSW for any significant period of time. Once the County has secured an agreement with a local landfill this cell could be converted for ash disposal.

Rationale for Recommendation: After almost 15 years of operation the WTEF has not experienced extensive downtime and has provided uninterruptable service. However, if the plant, under circumstances beyond the control of the operator, would encounter an extended downtime the County should have a backup landfill. By having a facility at NMCDF the waste can be hauled to the facility without causing a significant impact on transportation cost.

Recommendation 6.3: The County should continue to consider all options for disposal of MSW in the long term. One possibility is to site a new landfill in the County. A bioreactor landfill has some advantages over conventional landfills, and it may be appropriate for Marion County to consider this technology. This would require the County to identify and evaluate appropriate land use zones where solid waste facilities might be sited. Considering these locations the County would modify the Comprehensive Land Use Plan to ensure solid waste facilities could be permitted in these zones.

Rationale for Recommendation: In an effort to be proactive the County should review the Comprehensive Land Use and Zoning Plan to ensure that municipal solid waste landfills are identified as a possible use. Basic locational criteria can be applied to

identify areas that are suitable for this use. Subsequently, the land use plan should be modified to recognize these areas to allow such a facility to be permitted if needed.

Recommendation 6.4: The County should prepare an evaluation of long term disposal options considering the impacts of continued operation of the WTEF and disposal at local and regional landfills by the year 2009.

Rationale for Recommendation: As discussed in this Chapter, the WTEF has a limited capacity and the term of the current service agreement ends in 2014. With the waste stream growing the County will need to evaluate options for long term disposal beyond the contract term. A comprehensive evaluation of the disposal options should be performed by 2009 such that whatever decisions are made there is sufficient time to implement the preferred alternatives.

6.5.2 Ash Residue Disposal

Recommendation 6.5: The County, in cooperation with Covanta, should pursue options to reuse ash residue generated from the WTEF. Several states are moving forward with programs to examine beneficial uses for this material.

Rationale for Recommendation: Considering better ways to manage ash residue is consistent with state priorities to reuse waste material as well as to improve the overall quality of the environment. There is adequate capacity for disposal of ash residue at NMCDF. However, over the past 10 years more information and monitoring data regarding ash utilization has been made available. In various parts of the country jurisdictions are taking another look at alternative uses for ash residue from waste to energy plants. Burying ash that consumes land and creates leachate that requires treatment is not desirable. The County should accumulate data from existing ash reuse effort ongoing elsewhere and consider developing a pilot project to examine uses for the ash produced from the WTEF.

5. WASTE COLLECTION AND TRANSFER

This chapter discusses the current refuse collection and transfer programs in Marion County, identifies potential problems meeting existing and projected needs, evaluates alternatives, and recommends actions for improving the collection/transfer system. The focus of the chapter is service to residents and businesses, and the identification of any service needs. For purposes of this SWMP, waste transfer will refer to waste transport (by individuals or collection vehicles) to a transfer facility, with subsequent transport of the waste to a disposal site.

The next section provides background information on how solid waste handling is regulated and describes existing collection services and transfer stations. The existing system is evaluated in terms of its ability to meet existing and projected needs and the following objectives:

- To develop a solid waste system that is based on sound financial principles, provides cost effective services and maintains rates stability over a long term, while allocating cost equitably to all users.
- To provide services that meets the diverse needs of businesses and residences in urban and rural communities and that is both effective and fair to all users.

Following this, needs and opportunities in waste collection and transferred are addressed, and various future alternatives are explored.

5.1 Background and Existing Conditions

The County regulates refuse collection in unincorporated areas of Marion County and each city regulates it within their city limits. In addition, Marion County has been granted additional authority related to collection and transfer of solid waste. This regulatory authority and jurisdiction is described below. This section also describes existing collection services and transfer facilities.

5.1.1 Regulatory Framework

Local authority

Under 1999 Oregon Revised Statutes, local administrations (cities or counties) have the authority to enter into agreements “for joint local franchising of service or the franchising or licensing of disposal sites.” (ORS 459.065). Marion County is specifically authorized to “Regulate, license, franchise and certify disposal, transfer and material or energy recovery sites or facilities; establish, maintain, and amend rates charged by disposal, transfer and material or energy recovery sites or facilities; establish and collect license or franchise fees; and otherwise control and regulate the establishment and operation of all public or private disposal, transfer and material or energy recovery sites or facilities located within the County.” (ORS 459.125). This law grants flow control to Marion

County, which is a primary factor in determining the efficiency of solid waste management transfer and disposal. The right of governments to maintain flow control has been debated in a number of recent legal cases. The future of flow control has implications for how efficiently Marion County can manage solid waste. This issue is discussed further in Chapter 6, Waste-to-Energy and Solid Waste Disposal.

5.1.2 Existing Collection Services

In unincorporated areas, the County franchises private solid waste collection companies. Under the franchise agreements, municipalities determine the territory in which haulers will operate and the services they will provide. The County sets collection rates. Haulers operate independently of the County, provided they adhere to guidelines. The County may also manage waste operations in areas where the municipalities choose not to regulate refuse collection.

Rural rates and sparse rates (rates in sparsely populated areas of the County) have not increased since 1992. As shown in Table 5-1, collection costs increase relative to the number of cans collected at each pick-up. This rate schedule provides some incentive for customers to reduce waste and recycle. In unincorporated areas, the County also has the authority to review requests for adjustments to rates by the refuse collection company. Franchise agreements may have terms and conditions attached and may be revoked or amended after the County holds a hearing. Refuse collection service areas for Marion County are shown in Figure 5-1. For comparison, Table A-1 in the Appendix lists collection rates for a variety of municipalities in Oregon, both in and outside of Marion County.

In incorporated areas, each city franchises collection services (unless the municipalities choose to defer this authority to the County). The franchise agreements are similar to those used by the County in the unincorporated areas. Each City will administer the franchise, including determining the types of services and rates schedule for these services. Urban rates for Salem, Keizer, and Woodburn are shown in Table 5-1. These rates have increased slightly from average urban rates charged in 1995 (Table 5-1). Part of the increase in rates can be attributed to added services provided by franchise haulers.

Although municipalities can create franchise agreements in incorporated areas, Marion County currently retains flow control over all wastes generated in the County. As a result, all non-recyclable wastes collected in the County are sent directly to the WTEF unless the incinerator capacity has been reached. In this case, wastes may be diverted to other facilities. At the direction of PWES, franchised collection companies will periodically haul waste directly to the Coffin Butte Landfill when the WTEF is at capacity.

All areas within the County are provided with the opportunity to subscribe to collection services. The County continues to experience illegal dumping, however. Illegal dumping can be an indicator of service deficiencies, but residents who have access to garbage

[Insert Figure 5-1.]

**Table 5-1
Collection services and residential rates**

Service	Unincorporated Areas		Incorporated Areas			1995 Urban Rate
	Rural Areas	Sparsely Populated Rural Areas	Salem* (Mid-Valley Garbage & Recycling Association)	Keizer* (Mid-Valley Garbage & Recycling Association)	Woodburn (United Disposal Service, Inc.)	
Residential						
Each 32-gallon can at curb	\$13.85	\$15.20	\$14.95	\$15.95	\$15.65	\$10.75
Each 32-gallon can not at curb	\$16.10	\$18.10	\$12.30	NA	NA	\$13.00
20-gallon can at curb	\$13.35	\$14.70	\$13.20	\$14.20	\$13.50	\$10.25
Multi-family						
Each 32-gallon can at curb	\$11.10	\$11.80	\$10.25	\$15.95	\$15.65	\$9.65
Each 32-gallon can not at curb	\$13.85	\$15.20	NA	NA	NA	\$10.75
Commercial						
One-yard (1 st stop)	\$77.20	\$89.55	\$67.05	\$66.95	\$70.75	\$66.50
Two-yard (1 st stop)	\$132.75	\$150.00	\$120.95	\$120.70	\$120.80	\$117.55
Four-yard (1 st stop)	\$265.80	\$337.55	\$220.35	\$219.85	\$241.60	\$209.15
Six-yard (1 st stop)	\$356.80	\$445.00	\$316.65	\$316.00	\$362.40	\$316.65

* Rates are the same in the incorporated area and in unincorporated areas within the Urban Growth Boundary.

collection services may also illegally dispose of waste due to an unwillingness to pay dumping fees and/or a perceived inconvenience of transporting materials. Because waste collection services are currently available in all areas of the county, illegal dumping is not attributed to lack of service in Marion County. Convenience or cost of service may be more important factors contributing to the continuation of illegal dumping.

It is uncertain which measures could be most effective in minimizing the practice of illegal dumping because it appears to be related to cost and convenience issues and is not caused by a lack of service. Residents in sparsely populated areas of the County, who must drive long distances to reach transfer stations or landfills, may be less likely to dump illegally if transfer stations are closer and more convenient. Some residents are deterred by enforcement actions and the cost of legal dumping, and may respond to “amnesty days,” during which garbage is accepted free of charge. Also providing special collection events for bulky waste items can reduce illegal dumping. Other counties that provide free waste disposal service to residents still report problems with illegal dumping, however, so cost does not appear to be a primary deterrent.

Rather than expanding services, education and enforcement may be more effective strategies to investigate for minimizing illegal dumping. Education would include informing the public about the costs associated with illegal dumping and health hazards that can arise from rodent attraction and impacts to water quality. Residents can be educated through the distribution of pamphlets and posters, or a more extensive community education program could be established.

Marion County currently employs one nuisance abatement officer to serve the entire county. Road maintenance crews also may address illegal dumping issues. Monitoring and enforcement could be increased by the creation of a task force to address illegal dumping. Other methods of deterrence include increasing lighting at known illegal dumping areas and publishing names of offenders in local newspapers. The County could also consider mandatory collection for all residence. This would require all residents to pay for service. It is assumed that residents who pay for collection at the curb would be unlikely to haul garbage elsewhere for (illegal) disposal. It should be noted, however, that mandatory collection is expected to draw criticism from residents.

5.1.3 Transfer Station

There are currently two transfer station facilities in Marion County (see Figure 2-1 in Chapter 2). Transfer facilities accept residential and/or commercial garbage transported by residents and businesses. Currently, no materials are received from franchised haulers at these facilities (franchise haulers transport materials directly to the WTEF). Materials accepted at transfer stations include mixed garbage, yard waste, lumber, appliances, tires, and recyclable materials. Waste received at the transfer facilities that is not compostable or recyclable is transported to the WTEF. Certain loads from SKRTS that are rich in recyclable materials are sent to the MRRF. The two county transfer stations, NMCDF and SKRTS, are described below.

North county residents are served by a transfer facility at NMCDF. The 4-acre facility is located on I-5 about 3 miles north of Woodburn. The transfer station was constructed to serve disposal needs of north county residents, which arose after the closure of a landfill there. The facility also receives ash residue from the WTEF, which is placed in the facilities ash landfill. In 2000, 4,525 tons of solid waste was accepted at the NMCDF transfer station.

The County's larger transfer facility (SKRTS) is located on a 21-acre site east of Salem off Highway 22. The site consists of a scalehouse and scales (operated by the County), a covered tipping area for solid waste, and a recycling collection area. In 2000, 20,572 tons of solid waste was accepted at the SKRTS.

5.2 Needs and Opportunities

Current collection and transfer practices in Marion County are adequate to meet waste management needs. Although illegal dumping continues to be a problem, this cannot be attributed to a lack of residential service. The current franchise system meets the collection needs of the entire county and is expected to continue to do so in the future. Waste transfer demands are likely to increase as the waste stream grows, however, and existing transfer stations may need to be expanded.

5.2.1 Need To Expand Transfer Stations to Accommodate Increased Waste Stream

MSW collected by the franchised haulers does not pass through transfer stations, but is generally taken to the WTEF. The capacity of the WTEF is exceeded at times during the year due to seasonal waste stream fluctuations. When this event occurs, PWES directs franchised collection companies to haul to the Coffin Butte Landfill. At most times, however, WTEF capacity is sufficient to accept all incoming wastes. Due to the sporadic nature and relatively low volume of waste that periodically exceeds WTEF capacity, modification of the existing waste transfer system is not warranted at this time.

Based on projected waste stream increases (see Chapter 6, Waste-to-Energy and Solid Waste Disposal), however, transfer facilities may need to be expanded in the future. Within the next five years, waste generated will exceed the WTEF capacity throughout the year and in larger quantities, and more waste will need to be landfilled. Conservative projections of waste streams (assuming recycling rates increase) estimate that over 237,000 tons of MSW will need to be disposed of by 2006; 52,000 tons of this is MSW in excess of the WTEF capacity that will need to be landfilled. Waste disposal needs will continue to grow, particularly if the WTEF is discontinued after 2014.

As the waste stream grows, at some point it may be more efficient to create a more formal transfer program rather than having each franchise hauler transport waste directly to landfills when the WTEF capacity is exceeded. When transporting waste to the

landfill, franchised haulers use collection vehicles, which carry between 6–8 tons. Waste taken to transfer stations can be loaded into larger trailers, which can transport between 25 to 30 tons. Transportation savings from using fewer large truckloads will increase cost-effectiveness. Typically, it is more economical to consider transferring waste to larger trailers when landfill distances exceed 16 to 20 miles. The Coffin Butte landfill is about 25 miles from Salem and the WTEF. In the future it may be necessary to haul to landfills that are located even further from Marion County. Therefore, as the waste stream continues to grow beyond the capacity of the WTEF, it will be necessary to expand transfer station capacity to haul MSW to landfills located outside of Marion County.

5.3 Alternatives and Evaluation

5.3.1 Expand Transfer Stations

There is not an immediate need to create or expand transfer stations in the County. Projected increases in the waste stream indicate that the WTEF capacity will be exceeded year-round in the future. When this occurs, the development or expansion of transfer stations may be a cost-effective option for managing waste disposal. Transfer stations could be located at a single location or at multiple sites within the County. Important considerations for transfer station location include close proximity to areas where waste is generated and transportation access. Several options for transfer station expansion or construction are addressed below. Construction of transfer station facilities at MRRF or the WTEF are two possible alternatives. Two other alternatives relate to expanding existing transfer stations: NMCDF and SKRTS. At this time these facilities accept only residential/commercial materials delivered directly by residents, but they could be expanded to allow access for commercial waste haulers. The possibility of constructing a transfer station at a new site is also explored.

Expand MRRF to function as a transfer station

The MRRF, which currently accepts only commercial material to be sorted for recyclables, is located near the WTEF. MRRF and the WTEF are about one-half mile from I-5. Sufficient space exists in the area of MRRF to allow for expansion to a full-service transfer station. MRRF is located between Salem and Woodburn and, as such, it is centrally located relative to waste generation. The proximity of MRRF to I-5 also makes it easily accessible and increases convenience for haulers that are accustomed to transporting waste to the WTEF. If the WTEF remains in operation, all waste would be transferred to the same general area, maximizing efficiency for haulers, which should translate into lower costs.

Construct a transfer station at the WTEF

There is likely sufficient space at the WTEF that could be developed into a transfer station. This site would provide the same advantages as the MRRF location including

proximity to waste generation and a convenient location with easy access from I-5. In addition, siting the transfer station adjacent to the WTEF would simplify transportation issues from the perspective of the hauler; waste would be delivered to the same location, regardless of whether it were being incinerated or transported.

Expand NMDCF to function as a transfer station

Another possible location for transfer station expansion is NMDCF. NMDCF shares advantages found at the MRRF location including relatively easy access and space for expansion. NMDCF is located in the northern portion of the County (north of Woodburn) and is a less centralized location relative to waste generation and disposal facilities. Because of this, transport to NMDCF may be less cost effective than to MRRF. The NMDCF might however be a desirable location if the County were to consider disposal at other landfills located outside of the County. If disposal options north of Marion County are utilized the NMDCF may become more cost-effective.

Expand SKRTS

SKRTS is located close to areas of waste generation and is located just off a State highway, thus providing easy access. It is located in the south part of the region and, therefore provides a means to cost effectively transport waste to the Coffin Butte Landfill. Because of space limitations at the current site, additional property would most likely be needed in order to expand the transfer station to handle the additional volume from franchised collection vehicles.

Other possible transfer station locations

Transfer stations could be located at a number of other areas that meet the criteria of convenience, centralized location, available land, and transportation access. BI is centrally located and may be another potential location for siting of a transfer station.

A number of factors should be considered in transfer station planning. Determination of the most suitable site for a transfer station would need to take into consideration the location of current and future disposal options. Transfer station needs would vary depending on which of the following options are implemented (see Chapter 6, Waste-to-Energy and Solid Waste Disposal): the continuation of WTEF operation after 2014, possible future WTEF expansion, new landfill construction, or long-hauling to distant landfills. Another factor to consider will be the need to process and recover more material.

With the waste stream growing and with limited transfer station capacity in existing facilities, the need to invest in new transfer capabilities will increase in the near future.

5.4 Recommendation

Recommendation 5.1: To manage growing waste streams in an efficient and cost-effective manner, the County should investigate the creation/expansion of waste transfer stations.

Rationale for Recommendation: The need for waste transfer will be realized within the next 5 years. The County should begin planning now for activities that will be required within the next 3 to 5 years in order to implement transfer stations into the waste management infrastructure as they are needed. A comprehensive transfer station plan should be developed that weighs the financial and logistic merits of several transfer station options. Another factor to consider in drafting a plan includes how the transfer stations should be owned and operated. The County may choose to retain full control of facilities, or to work through a public-private partnership.

4. RECYCLING AND MATERIALS PROCESSING

Recycling is considered an integral component of the Marion County solid waste management program and is required by Oregon law. The State has established mandated recycling goals requiring an increased amount of material to be recovered. Marion County is achieving the state goal through the implementation of a number of programs, as described in Chapter 3. As recycling increases, the demand for materials processing also increases. Recycling can also be stimulated or depressed based on market demands for certain materials. Because materials processing is driven by the composition of recyclables and collection methods, this Chapter reviews and expands these topics.

4.1 Status of Existing Collection and Processing Capabilities

The County has franchised curbside collections, and processing and marketing of recyclable paper, cardboard, glass containers, plastic containers, aluminum and tin containers, and yard waste. Nine franchised refuse haulers, making up the Mid-Valley Garbage & Recycling Association, provide curbside collection service in Marion County. Several organizations provide processing and marketing services for the collected recyclables. Almost all of the single-family households in Marion County receive weekly curbside recycling collections. Various municipalities have also implemented curbside yard waste collections throughout the County. Some cities are converting their curbside recyclables collections to an automated system, and several cities are implementing commingled collection programs, which will have the recyclables processing carried out through a cooperative arrangement among Marion Recycling Inc., Garten Services Inc., and Far West Fibers. A further description of this initiative and the existing recyclables processing infrastructure in the County is discussed below.

4.1.1 Existing Collection Capabilities

As discussed in Chapter 3 recyclable materials are collected from several sources including curbside collection trucks, drop off centers, transfer stations and by individual companies. Most of the recyclable materials are taken to a facility owned and operated by the Mid-Valley Garbage & Recycling Association for processing and marketing. Table 4-1 highlights annual tonnages for 1999 and 2000 for the Mid-Valley Garbage & Recycling Association; these numbers reflect cumulative totals from all haulers in Marion County including curbside, SKRTS, and NMDCF. Table numbers also include the drop centers because the franchised collection companies pickup materials from these facilities. Materials received at SKRTS and NMDCF are sent to other locations for processing, as described below. Further information on materials received and operations at SKRTS and NMDCF is provided in Chapters 2 and 3.

Salem-Keizer Recycling & Transfer Station (SKRTS)

SKRTS, owned and operated by Capitol Recycling and Disposal, receives source-separated materials. In 1995, the receiving area was expanded so that the facility could handle all recyclable materials brought in by the public. Yard waste and wood waste is segregated and transported to WWR for composting. SKRTS was expanded in spring of 2000 with the construction of a second gatehouse and a longer inbound scale. Improvements reduce congestion and permit SKRTS to serve a large number of residents in a more efficient manner.

Table 4-1
Mid-Valley Garbage & Recycling Association Recyclables Collection Tonnage

Category	1999	2000
Newspaper	10,294.37	12,199.52
Cardboard	11,462.84	12,693.15
Hi-Grade Paper	293.75	671.70
Magazines	753.82	
Mixed w. Paper	1,480.35	1,539.13
Phone Books	69.83	
Tinned Cans	1,109.77	968.12
Aluminum	45.84	113.71
Scrap Metal	9,370.29	13,667.00
Lead Acid Batteries	50.17	56.34
Yard Debris	25,998.26	28,195.89
Wood Waste	15,629.19	11,934.09
Motor Oil	196.90	206.29
Tires	201.98	169.96
Glass	1,829.69	1,923.57
Milk Jugs	25.53	317.16
Plastics #1-7	525.79	27.45
Boxed Plastic	30.88	
Milk Cartons	19.30	33.37
Cow Chow		721.19
Dry Cell Batteries	11.11	1.80
Roofing/Sheetrock		
Other ¹	1,733.38	749.01
Total	81,133.04	86,188.45

¹ Other includes: transfer station, appliances, buffed rubber, sawdust, mixed ledger, wood, yard debris, magazines, mixed waste paper, tires, rubber dust, trees, sheet plastic, concrete, copper, gypsum, gyplords (corrugated boxes) and latex paint.

North Marion County Disposal Facility (NMCDF)

The County-operated NMCDF serves the northern most part of Marion County. The facility operates as a transfer station and recyclables drop-off depot for source separated materials.

4.1.2 Existing Processing Capabilities

Marion County recyclables are primarily processed at three facilities: Garten Services, Inc., MRRF, and Far West Fibers in Hillsboro, Oregon. Processing at these facilities is described below.

Garten Services, Inc.

Garten Services Inc. is a private, non-profit organization providing jobs and training for persons with disabilities and is the primary processor/marketer of recyclables from non-commingled collections throughout the county. Garten Services receives, grades, sorts, bales, and ships mill-ready recyclables through its 120,000 square foot processing facility. The facility receives materials in package lots and in bulk from throughout the County and the state and has shipping access for eight trailers and four rail cars. Garten currently accepts, processes, and markets the following materials (see Table 4-2):

- corrugated cardboard
- newspaper
- multiple grades of office and printing papers (including books and magazines)
- mixed papers and paper packaging (including “grayboard,” aseptics, and milk cartons)
- plastic films (polyethylenes)
- all clean, rigid plastic containers (bottles, tubs and trays)
- aluminum and tin cans
- color separated glass containers

Garten Services receives its recyclable materials from various sources. These sources include local haulers, private businesses, state and local government offices both inside and outside the County, smaller independent recyclers and franchised haulers throughout the state, and mixed office papers from a major recycling processor in the Portland Metro Region. In 1999, Garten Services received 76.16 percent of its recyclable material from Marion County and 23.84 percent from all other sources. In 2000, Garten Services received 60.78 percent of its recyclables from Marion County and 39.22 percent from all other sources. The increase in materials received from outside Marion County is due to expanded programs to market services to other areas of the state, particularly the Portland metropolitan area.

Garten’s current focus in Marion County is to expand the Saturated Collection of Office Paper (SCOOP) program. This program was designed by the partnership between Garten Services, Marion County, and the franchised haulers to increase the amount of office

Table 4-2
Annual Tonnage of Recyclables Processed at Garten Services
(Materials Received from Marion County and All Sources)

Material	Amount Collected from Marion County in 1999	Total Amount Collected in 1999	Amount Collected from Marion County in 2000	Total Amount Collected in 2000
High Grade Paper	2,274.16	4,003.27	1,083.99	5,200.49
Mixed Waste Paper	3051.73	3,894.42	728.27	3,055.57
ONP Newspaper	7,045.53	9,206.39	5,270.38	8,135.29
Magazines	593.27	1,009.99	369.63	1,122.02
Telephone Books	124.10	136.83	80.39	227.05
OCC Cardboard/Kraft	11,851.23	14,093.43	11,592.50	14,542.84
Commingle ¹	0	0	3,795.91	6,259.90
Aluminum	7.10	7.10	0	0
Tinned Cans	76.38	127.68	47.37	297.14
Glass	23.74	30.00	130.58	138.45
#4 LDPE (Plastic Film)	100.49	105.16	87.29	97.39
#1-7 Plastic Bottles ²	340.70	1,244.45	0	0
#1-7 Mixed Plastic ²	8.74	108.53	0	0
#1 PET Beverage ²	.44	46.35	0	0
#2 HDPE Milk Jugs ²	42.48	144.84	0	0
#2 HDPE Other ²	4.95	21.58	0	0
Plastic Containers	397.31	1,565.75	390.04	975.37
#3 Polyvinyl Chloride ³	2.01	2.01	0	0
#5 Polypropylene ³	52.42	58.79	0	0
#6 Polystyrene ³	4.92	5.08	0	0
Other Plastics	59.35	65.88	2.39	31.36
Total	27,603.39	36,244.9	25,578.74	42,082.87

¹ Commingle means that the papers came in mixed together and were sorted. This term does not allude to commingled mixed residential recyclables.

² Plastic Containers includes the 1999 categories: #1-7 Plastic Bottles, #1-7 Mixed Plastic, #1 PET Beverage, #2 HDPE Milk Jugs, #2 HDPE Other. In 2000, these categories were combined and are called "Plastic Containers."

³ Other Plastics includes the 1999 categories: #3 Polyvinyl Chloride, #5 Polypropylene, and #6 Polystyrene. In 2000, these categories were combined and are called "Other Plastics."

paper being recycled by area businesses. The program provides the businesses with educational materials, containers and collection service. Additionally, Garten has received a grant from Marion County to employ a sourcing representative to visit multi-tenant commercial establishments and encourage cooperation in developing a centralized pick up. This service is designed to coordinate route efficiency with the collection routes of the haulers who pick up the materials for delivery to Garten. The program features a total mixing together of all paper grades in order to save space and increase convenience for the participant.

All paper delivered to Garten is processed to ensure the quality meets purchasing mill standards and then is shipped in unit loads directly to mills in Oregon, other areas in North America, and the Pacific and Indian Ocean Rim. Garten is in the process of upgrading the quality and capacity of its paper sorting capabilities and expects to be able to process over 4000 tons per month by 2003.

Recent improvements in local markets have been encouraging. The paper mill in Halsey, Oregon specializes in blends of office and printing papers. After undergoing several recent changes in ownership, the mill has established a direct relationship with Garten, thus creating a priority supplier / customer relationship. This new partnership has allowed for creativity in developing paper blends that are unique but mutually advantageous. The paper mill in Newberg, Oregon has recently installed new processing equipment, which allow for mixed grades of paper to be accepted. This is the first such market for this material in the region and offers new potential in the collection and processing of special mixtures of papers. The recent purchase of Willamette Industries by Weyerhaeuser will include the major corrugated cardboard recycling mill in the region (in Albany) but is not expected to have any adverse effects on this market. Foreign marketing opportunities through the Port of Portland (particularly the expansion of markets in China) or directly to Canadian and Mexican markets always allow for healthy market diversity available for commodities marketed from Marion County.

As the demand for process materials collected in a “commingled” form increases, Garten has positioned itself to benefit and contribute indirectly. Processing equipment that can efficiently and safely handle commingled materials is expensive, and the volume of materials than could potentially be processed in Marion County is a limited. Because of this, Garten has chosen to enter into a unique three-way partnership, rather than modifying facilities to accept commingled materials. Commingled residential materials collected by the franchised haulers will be reloaded at the MRRF and efficiently transported to a Far West Fibers facility in the Portland Metro Region. A back haul will provide the Garten facility with mixed office papers that were collected in the Metro Region. Garten is building and will operate a less costly system, with the highest safety considerations for their employees in mind. This highly efficient and higher capacity sorting system, which is scheduled to be completed in July of 2002, is designed specifically for mixed office papers.

Marion Resource Recovery Facility (MRRF)

The Mid-Valley Garbage & Recycling Association owns and operates MRRF in Brooks. MRRF is a 36,000 square foot, fully enclosed facility designed to sort recyclable materials from the dry waste streams collected by local garbage/recycling hauling companies. This newly constructed facility became operational in April 2000. Most wastes handled at this facility are construction and demolition (C&D) material and select commercial loads with potential recovery of wood and corrugated fiber.

MRRF reports that it will be able to sort over 35,000 tons per year of C&D waste and select commercial loads at this facility. The commercial loads are selected because they contain high amounts of either corrugated cardboard, wood or paper products that can be readily recycled. The loads are dumped onto a tipping floor where certain materials can be manually sorted. The remaining material is loaded onto a conveyor, and wood, corrugated cardboard, and metal can be sorted and marketed. However, the facility is set up primarily to process high graded or select commercial waste and C&D waste and is not capable of processing commingled recyclable materials.

In 2001 the facility processed 28,515 tons. Of this amount over 11,000 tons of material was sorted and recycled. This included wood and old corrugated cardboard material as well as sheet rock which was taken to the Brown's Island (BI) landfill. Residue from the facility, about 17,351 tons, was hauled to the Coffin Butte Landfill for disposal.

The haulers that own the MRRF are proactive in the community. They handle some aspects of Marion County's recycling education program. MRRF is also planning to expand the level of recovery/recycling of commercial waste and use of the facility for staging and transshipment of commingled residential recyclables. In January of 2002, Mid-Valley Garbage and Recycling Association entered into a ten-year agreement with Far West Fibers and Garten Foundation to process materials collected at the curbside (see also description above in Garten Services, Inc. section). Under the agreement, commingled or source separated materials will be reloaded at MRRF and transported to Far West Fibers in Portland for processing and marketing and mixed paper will be back-hauled to Garten Services.

This agreement provides the available capacity to process all recyclables generated in Marion County for the next 10 years. More importantly, neither the County nor the parties to the agreement will need to invest large amounts of capital to handle the added volumes of recyclable materials.

Far West Fibers

Far West Fibers owns and operates a large processing facility in Hillsboro, Oregon. The plant was built to respond to the changes in collection of recycled materials from source separated to commingled. As a result, the plant handles a significant amount of the commingled recyclable materials collected in the Portland area.

Far West has been in the recycling business for over 10 years and has established market outlets for these materials. By sending the recycled materials for processing at Far West, the certainty for marketing materials collected in Marion County has been secured. Garten Foundation will benefit from this arrangement by processing and marketing all of the mixed paper products that are delivered to Far West Fibers.

4.1.3 Yard Debris and Wood Waste Process Facilities

Yard debris and wood waste composting is a special category of recyclables processing. In Marion County, these materials are processed at Wood Waste Reclamation (WWR) and Brown’s Island (BI). Processing at these facilities is described below.

Wood Waste Reclamation (WWR)

WWR operates a yard waste composting and wood mulching facility in Aumsville. The facility opened as a result of the 1997 burning ban in Salem. WWR sits on a 10-acre site and currently processes wood and yard waste from the county transfer stations, franchised curbside haulers, and from self-hauls. In the last two years, Wood Waste Reclamation handled about 30,000 tons per year. The breakdown of this tonnage is shown in Table 4-3.

Table 4-3
Wood Waste Reclamation Inc. –
Composting Tonnage Statistics for Materials Received and Sources

Sources of Materials	1999 (tons)	2000 (tons)
Self Haul	3,393.17	1,228.27
Curbside	22,685.35	23,573.75
Salem Keizer Recycling Transfer Station (SKRTS)	2,954.88	2,549.24
Woodburn Area Recycling Transfer Station (WARTS)	390.79	247.11
Polk County	2,043.36	2,229.82
Total	31,467.55	29,828.19

WWR chips scrap wood from the private sector and ships the material to the Smurfit Mill in Newberg, Oregon to be used as fuel. Although WWR is now processing over 30,000 tons per year, the operators indicate that the facility could process up to 50,000 tons at the existing site. In order to increase this current tonnage, WWR has started accepting some green feedstock such as vegetative waste or produce waste. A number of haulers have begun picking up such vegetative food waste from restaurants and grocery stores along their routes. In 2000, for example, WWR reported receiving separate green waste loads totaling 790 tons.

Other initiatives being considered or piloted by WWR that would increase recycling levels in Marion County include:

- Processing of “non-green” food waste (anaerobic digestion and production of methane are being explored);
- Incorporating soiled paper, such as paper plates and napkins from special events; (this is being piloted in the existing compost operations);
- Adding mixed residential vegetative food waste with yard debris; and
- Sheetrock recycling

Most compost from the WWR facility is sold to local retailers. WWR management reports that there would be no problem marketing the material resulting from increased input. There is currently high demand for the compost product. Potential markets also exist in the Portland metropolitan area.

Brown’s Island (BI)

BI composts wood waste and yard debris. Compostable materials received at the facility come from the Salem Parks Department clean-up projects and from material dropped off by the public at the NMCDF. After trucks deposit compostable materials from NMCDF at BI, they are loaded with finished compost, which is returned to NMCDF to be used as daily cover. The system is more efficient because trucks moving in both directions (to and away from the BI facility) transport material. Although most compostable material in the County is processed at Wood Waste Reclamation, the BI facility is available in the event that additional composting services are needed.

4.2 Needs and Opportunities

Marion County’s efforts to meet the new state recovery rate goal may result in collection of commingled materials from households and expansion of multi-family and commercial collection programs. These changes will certainly result in collection of more materials for processing and marketing and will alter the composition of materials received.

The current system of processing facilities is handling and marketing approximately 100,000 tons of recyclable material each year. By continuing to operate it’s current programs and by implementing recommended new programs and services, the amount of materials recycled could grow to over 120,000 tons per year. Thus, a 30 percent increase in processing capabilities would be needed over the next 5-10 years. This increase would not necessarily be at one facility but would probably be distributed to include slight increased processing capabilities at WWR, Garten Foundation and MRRF.

4.3 Processing/Material Recovery Alternatives

To process increasing volumes of recyclable materials, existing services may need to be expanded or enhanced. Potential methods that may be employed to increase recyclable processing are presented below. General recyclable materials are addressed first, followed by a discussion of compostable materials.

4.3.1 Processing of Recycled Materials

Several of Marion County's cities are beginning to convert to collection of commingled materials while other curbside programs remain source separated at the curb. Increases in household participation and volume collected typically result when curbside programs put the burden of separating recyclables on the processor rather than the resident. Processing facilities must adjust to accommodate both the changes in technology and the increase in amount of materials. The following alternatives, described in more detail below, outline several possible system changes that could be implemented to manage recycled material in the future:

- Expand MRRF
- Evaluate Garten's Source Separated Operations
- Processing at Transfer Stations
- Construct a new material recovery facility

Expand MRRF

As more and more residential areas of Marion County are converted to commingled collections from source-separated collections, an increase in recyclable materials collected is expected. The current processing facility is capable of sorting and processing select commercial loads and C&D wastes to recover wood waste and corrugated cardboard, but with its current sorting capabilities MRRF cannot process commingled materials.

MRRF's proximity to the more densely populated areas of Marion County and to rail lines make this facility a desirable location for receiving, reloading, and shipping recyclable materials. In order for the facility to process commingled recyclables, a significant investment must be made in the current facility. This would include constructing a new building to process the commingled stream.

Evaluate Expansion of Garten's Services

Currently, Garten Services accepts source-separated materials at its facility. In 2000, Garten Services reported that it processed approximately 1,539 tons of recyclables that would also meet the standard commingled definition.

Garten Services has been shifting its operations and making improvements to its facility so that it can receive, sort, and market various grades of paper. These modifications are a result of Garten Services' decision to move away from processing containers and to completely focus on paper processing and marketing materials from pre-processed residential curbside commingled collections.

Although the Garten facility could be used to process commingled recyclables, its facility would have to be reconfigured to have a material recovery facility layout. This new design would involve some substantial equipment costs to add staging areas and sort

lines. This reconfiguration would not address management's concerns over safety for Garten's employees, as there would be potential exposure to glass breakage and sharp objects.

Processing at Transfer Stations

An alternative to handle an increase in commingled collections in Marion County would be to expand the current operations at the two transfer stations and ship the recyclables out-of-County for processing and marketing. These transfer facilities may need improvements to their sites to accommodate the increased volume of traffic that would result from this operation. A large drawback from this type of arrangement would be significantly cutting Garten Services out of the County's recycling operations. Additionally, the cost of processing and marketing the materials may increase as the economics of long hauling the material could become cost prohibitive.

Construct a New Material Recovery Facility

Marion County could build a new material recovery facility operation in the County. This facility could be designed with the intent to handle existing commingled collections as well as to meet longer term needs to transfer waste in excess of the WTEF out of the County. If built as a County facility, it would require land acquisition and siting, engineering design, construction, equipment, and staffing. This option would require substantial planning and start up costs.

4.3.2 Processing of Yard Waste/Green Waste Collections

Yard waste/green waste is one area that has been targeted as a potential source for increased recycling in Marion County. As the volume of these materials increases, the County's composting capacity would need to be expanded. Possible system changes that could be implemented to manage yard waste/green waste in the future include:

- Expand operations at WWR
- Contract with private companies in the area
- Secure additional mobile processing equipment
- Expand BI

These alternatives are described below.

Expand WWR

Residential yard waste collections in Marion County occur in several of the more populated areas of the County. Recycling tonnages could be increased if more households were provided with curbside yard waste collections on a frequent basis. WWR reported that in 2000, the facility received about 30,000 tons of material. Estimates indicate that the facility can easily manage 50,000 tons of material per year. WWR can handle additional increases in materials as new communities begin to add curbside yard waste collections or increase their existing programs without significant changes to their current operations.

Contract with private companies

There are several private companies in Marion County and its surrounding borders that could supplement the existing composting services in Marion County. As new communities begin yard waste collection, these companies could provide services when transportation may be cost prohibitive and/or WWR reaches capacity. As with any recyclable, transportation costs comprise a significant portion of yard waste processing costs.

Secure additional mobile processing equipment

By securing additional mobile processing equipment, the County could more easily reach more rural areas for collecting and processing yard waste. Although there would be an additional cost to purchase equipment and hire labor, these costs may be more than offset by the decreased transportation costs, increased materials recovered, and possible sale of material.

Expand BI

WWR has adequate facilities to compost current and some future growth in organic material collections. BI is available, however, if the need arises to process additional compostable materials. Composting operations currently exist at BI, and additional space is available for expansion.

4.4 Recommendations

Marion County has adequate recycling collection and processing facilities to handle its current needs. The collection and recycling technology is transforming from source separation to commingled programs, and the various operators have begun to implement a new system for processing and marketing materials. This new system has emerged through the development of cooperative agreements with all parties working to ensure the system has the capabilities to not only process and efficiently transport materials, but to improve overall marketability. With a few modifications, these same facilities should be able to handle the expected growth Marion County should realize over the next 10 years.

Given the recent agreement between Mid-Valley Garbage and Recycling, Garten Foundation, and Far West Fibers, adequate capacity is available to meet demand for processing and marketing increased amounts of recyclable materials. Therefore, there are no immediate recommendations to implement changes in the process handling facilities.

Recommendation 4.1: The County should continue to monitor the progress of the agreement between Mid-Valley, Garten, and Far West and work with these parties to make refinements needed to ensure recyclable materials are processed and marketed.

Rationale for Recommendation: Although the agreement between the three parties to process and market recyclable materials is a good strategy, it is a relatively new arrangement. Furthermore, the Countywide recycling system is totally dependent on the success of these parties to perform. Alternatives to this arrangement, as discussed in this Chapter, include expanding the existing MRRF or building a new material processing facility. In the event of failure of the current system, however, any of these alternatives would require some implementation time before such a facility could become operational and able to meet the increased processing demands. By monitoring the performance of the arrangements on an annual basis, all parties can make adjustments designed to ensure that recyclable materials are processed and marketed. In addition, as the system matures it may be desirable to review collection rates or other policies in order to identify additional incentives that may be implemented to help achieve system goals. This can only be achieved by continued monitoring of the program.

Recommendation 4.2: Continue to implement pilot programs (as described in Chapter 3) to develop methods for composting “green waste” and other food by products.

Rationale for Recommendation: Marion County has almost completed its implementation of yard waste collections in the more densely populated areas of Marion County. WWR currently processes all of the residential yard waste collected in Marion County. The facility produces compost, which is sold by the truckload. WWR can handle both the current and the future projected volumes of yard and vegetative food or green waste processing identified in this plan. Potential methods to expand yard and food waste collections, such as increasing collections at restaurants and grocery stores and expanding curbside pickup (see Chapter 3), can help supply more material to this facility.

3. WASTE PREVENTION/REDUCTION/RECYCLING ANALYSIS

PWES has implemented a multifaceted, comprehensive recycling and waste reduction program, which satisfies the requirements of the 1991 Recycling Act (Senate Bill 66). Since the inception of PWES' program, the amount of waste recycled has grown steadily. The recovery rate has grown to 44 percent in 2000. This is computed by adding the reported rate of recycled materials (38 percent) with the applied credits for implementing various waste prevention/reduction programs (6 percent). Marion County's 2000 recovery rate surpassed the ODEQ mandate of 25 percent by 1996.

Table 3-1 shows the County's historical quantities of waste reported as recycled over the past five years. The totals found in Table 3-1 combine the annual materials reported to Marion County from the curbside programs, commercial recycling, recycling depots, and

**Table 3-1
Recycled Materials Tonnage Reported to Marion County**

Collected for Recycling by Franchised Collectors	1996	1997	1998	1999	2000
Newsprint	9,176	10,012	10,480	11,048	12,200
Cardboard	10,058	11,826	11,028	11,463	12,693
Glass	1,517	1,302	1,690	1,830	1,924
Tin	1,657	1,640	1,684	1,110	968
Used Oil	198	221	192	197	206
High Grade Paper	169	263	365	294	672
Scrap Metal	10,306	11,480	13,080	9,370	13,678
Aluminum	78	54	40	46	114
Milk Jugs	36	45	68	26	317
Lead-Acid Batteries	38	35	151	50	56
Consumer Batteries	N/A	1	2	12	10
Computers	N/A	N/A	N/A	N/A	93
Mixed Waste Paper	283	466	1,261	1,550	1,539
Tires	326	302	266	202	170
Wood	13,298	16,853	18,306	15,629	11,934
Yard Debris	2,987	13,203	24,320	25,998	28,905
Plastics #1-7	226	546	427	526	337
Paint	8	88	46	104	118
Other	333	2,410	230	1,679	1,874
Total	51,022	70,745	83,636	81,133	87,808

Source: Marion County Solid Waste Management – 2000 Annual Report

transfer stations. Some materials directly recycled by waste generators (i.e. not collected by waste haulers and/or not taken to County transfer stations) are not reported to PWES but are reported directly to the ODEQ. These quantities are not included in Table 3-1. This accounts for the discrepancy between the total materials recycled in 2000 in Tables 3-1 and 2-4. The amount of materials listed in Table 3-1 (87,808 tons) includes only those that are received by Marion County facilities; the quantity listed in Table 2-4 in Chapter 2 (133,277 tons) also includes materials recycled directly by organizations.

Components of the countywide waste prevention and recycling program are discussed in the following sections. Needs and opportunities in Marion County are evaluated after the description of existing programs. Techniques to address needs in three categories are then investigated: increased participation in existing programs, expanded services to underserved sectors, and increased recycling of specific materials. Within each category, specific areas are identified that can be targeted for greater waste reduction, reuse and recycling.

3.1 Existing Waste Reduction and Reuse Programs

3.1.1 Waste Reduction Programs

Reduction of solid waste generated by residents and commercial establishments is a priority of PWES' solid waste management program. This is reflected in the objectives adopted in this Updated SWMP which should be used to establish priorities.

The values pertaining to waste reduction, reuse and recycling are as follows:

- 1. To provide an integrated solid waste management system that achieves an effective combination of strategies and programs guided by the principles adopted in the state hierarchy to reduce waste at the source, reuse and recycle materials, compost, recover energy and land disposal.*
- 2. To continue educating consumers in order to promote practices and methods to reduce the long-term per capita waste generation.*
- 3. To develop programs and support implementation of facilities that seek to ensure materials recovered from the waste stream attain the highest and best use and are recycled.*

In keeping with these priorities the County, cities and service providers have implemented several waste reduction initiatives described below.

Promotion and education programs (including reuse and recycling education)

Through partnerships with local businesses, trash and recyclables haulers, and citizen volunteers, PWES has developed a solid waste education outreach and promotion program for recycling, composting and other waste reduction methods. The existing

program provides information to citizens, teachers and students, businesses and institutions, and community groups. The following is a list of the various services and programs that have been instituted:

Key Education Programs

- School presentations by a full-time Recycling Educator and qualified volunteers
- Master Recycler/Composter program classes
- Green Building classes
- Waste audits for businesses desiring to identify waste reduction and recycling opportunities
- College Scholarships to facilitate the education of more individuals in the field of solid waste management and waste reduction

Key Promotional /Educational Programs

- Distributions of “Waste Matters”, a multi-page tabloid filled with recycling, waste reduction, composting, and general solid waste information, to all County residences twice a year
- Working with Mid-Valley Garbage & Recycling Association on development and distribution of recycling education and promotional materials
- Sponsorship of compost bin sales
- Support of Capital Recycling & Disposal’s self-guided nature walks “Earthwalk” at the Salem-Keizer Transfer Station with stops where children, and the public at large, can learn more about waste reduction and recycling
- Regular public service announcements and news stories broadcasts
- A regularly updated website which outlines the County’s comprehensive Recycling Program (<http://www.open.org/~mswm>)
- Sponsorship of a Recycler of the Year Contest
- Recycle Art Calendar Contest at area schools
- Promotion of business paper recycling through the SCOOP (Saturated Collection of Office Paper) program
- Promotion of non-County run reuse and recycling programs including:
 - Goodwill Industries’ drop-off sites throughout Marion County
 - St. Vincent de Paul collections of reusable items at Salem-Keizer Transfer Station
 - Christmas tree collections by church and scout groups
- Development of a new in-depth solid waste management system handbook

Key Services/Grant Programs

- A recycling hotline sponsored by Mid-Valley Garbage and Recycling Association to provide residents with the latest waste prevention and recycling information. In Salem: (503) 390-4000. Toll free outside of Salem: (877) 390-4001.
- Partnering with several local retailers and garden stores to sell a variety of backyard composters at wholesale prices year round
- Compost demonstration sites at selected locations throughout the County
- Award of Waste Reduction grants aimed at collection of office paper, recycling of plastic agricultural baling twine, developing recycling opportunities in Housing Authority owned multi-family units, and rewarding schools with active and innovative waste reduction and recycling programs

PWES' education, promotion and services program is a comprehensive approach that has proven to be effective in advancing the overall strategy to reduce waste. By working with collection companies and other service providers, it targets all generators of waste while continuing to educate future generations about the methods and means for reducing wastes.

Purchasing and production practices

Buying products made with recycled content is an important component of closing the recycling “loop.” Each November, PWES promotes a “Buy Recycled Month.” Over fifty local stores and businesses promote the products they sell that are made with recycled content. The stores use “Buy Recycled” window signs and shelf talkers.

In 1999–2000, PWES worked with the architect and building contractor of the new Courthouse Square Government office building to incorporate products with recycled content into the design, as well as recover as much material as possible during the construction. Through these efforts, PWES met the standards of the U.S. Building Council’s LEED Green Building Rating System. The LEED (Leadership in Energy and Environmental Design) system rates new and existing buildings, evaluating environmental performance from a “whole building” perspective over a building’s life cycle (U.S. Green Building Council 2002). Buildings are given credits for meeting specific criteria in six categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials & Resources, Indoor Environmental Quality, Innovation & Design Process. By earning enough points from this rating system, PWES was able to reach “Bronze” status (Bronze is the fourth highest rating a project can achieve). To further promote the use of recycled content materials in construction projects, PWES offers “Green Building” classes.

Commercial auditing programs

Commercial waste audits often prove to be a valuable tool to businesses to recognize areas where they can improve and increase their recycling efforts, streamline processes, eliminate waste generation, and save money on waste disposal. PWES provides free

technical assistance to businesses in the County by offering to conduct business waste audits. During these audits, Department personnel identify sources of waste generation, collect data on waste being generated, observe businesses processes, and analyze waste disposal and recycling activities and costs. All waste haulers in the County also provide waste audits services similar to those offered by PWES.

Request for business audits has been low over the past few years. At present, PWES performs a very limited number of business waste audits, generally six per year at most. PWES has reported that most of the business waste audits have been successful and several have resulted in significant cost savings for the businesses involved.

Garten Recycling Service, in conjunction with Marion County and franchised collection companies have developed the SCOOP (Saturated Collection of Office Paper) program. This program was created to increase office paper recycling by educating businesses about recycling, providing alternatives for recycling pick-ups, and designing a recycling program that best fits the individual business. The waste hauler provides outside containers and collects the paper. It is then taken to Garten Services where it is graded, sorted, packed, and shipped to various mills for recycling.

Home composting

PWES operates a home composting promotion program. The objective of this program is to encourage residents to compost yard waste on their property rather than place that material at curbside for collection. Each year PWES sells compost bins to its residents; in 2000, PWES sold 2,158 compost bins. Slightly fewer bins (2,098) were sold in 2001 (the decrease is attributed to the dry season, which resulted in reduced growth of vegetation and lowered demand for composting bins). Classes and literature on composting are available through PWES, as well as free technical assistance from the recycling staff.

PWES promotes “grasscycling”, or leaving grass clippings on the lawn, as a waste reduction method. The practice is promoted through the distribution of literature published by PWES and at composting education classes.

3.1.2 Reuse Programs

PWES promotes and facilitates the donation of materials to non-profit groups for reuse and recycling. Department recycling literature suggests the donation option and provides referral information for non-profit groups seeking reusable materials. PWES promotes buying, donating or selling used items at thrift stores as a way of giving items a new life. Some of these stores include: Goodwill Industries, Humane Society Shop, St. Vincent De Paul Store, Salvation Army Thrift Store, the Union Gospel Mission Store, and Value Village. These stores accept or sell such items as: clothing, appliances, furniture and other household products. Most of these organizations support on-the-job training programs or provide funds to charitable organizations or causes. Additionally, PWES also funds the operation of a reuse site by St. Vincent de Paul at the new recycling area at SKRTS.

PWES works with local schools, scouting organizations, churches, and businesses to promote waste reduction, material reuse and recycling. The Waste Information Team, a group of interested citizens, works closely with PWES to implement programs to reduce both waste and waste toxicity. They are credited with developing the curbside collection of household batteries and household hazardous waste collection events. Several retailers and garden stores work with PWES to promote composting and offer composting bins at cost. Other local stores and businesses help customers learn more about closing the recycling “Loop” by “Buying Recycled” through the use of window signs and shelf talkers.

3.1.3 Recycling Programs

PWES is committed to providing residents with convenient, cost-effective, quality recycling services, which exceed the State recycling goals. This mission is best accomplished through partnerships with the waste generators, the recycling community, the franchised collection companies and the cities; these groups continue to educate and motivate residents and businesses to voluntarily reduce, reuse and recycle. PWES has implemented several recycling initiatives consisting of curbside collections, commercial recycling, drop off facilities, special waste collections, and tire and agricultural waste recycling.

Curbside collections

Once per week curbside collection of designated recyclable materials is provided in the cities and suburban areas of Marion County for all single-family homes. Residents place metal (tin and aluminum), glass, and plastic (#1 – 7) into red recycling baskets provided by the hauler. Residents also sort out corrugated cardboard, catalogs, grayboard, magazines, mixed scrap paper, newspaper, dry cell batteries, latex paint, and motor oil.

PWES also offers multi-family recycling programs and provides grants to develop programs for this sector of waste generation. Participation in multi-family recycling programs is not as high as desired, however, due to limited environmental commitment on the part of management, frequent management turnover, and the transient nature of residents.

Commingled collections of recyclables, where materials are mixed together in one container, occur in or are planned for several cities throughout Marion County. Stayton has been collecting residential commingled recyclables since June 1, 2000. Woodburn also has weekly manual commingled collections. Beginning June 1, 2001, the City of Keizer began commingled recyclables collection. Keizer residents now have three roll carts – (1) a blue cart for commingled recyclables, (2) a green cart for yard waste and (3) a gray cart for garbage. The units can be lifted and dumped using automated equipment, rather than requiring manual handling. Residents are asked to put selected items in the red recycle basket; these include: latex paint, dry cell batteries, used motor oil and glass bottles and jars. Commingled recyclables and yard waste are collected on alternate weeks on the designated garbage day. The City of Silverton initiated a similar program on

October 1, 2001, with weekly, automated yard waste and commingled recycling collections. PWES plans to expand commingled recycling to other cities and rural areas of the County.

In the past few years more communities have moved from a source-separated collection program to one that allows households to commingle materials. This makes it much easier for these households to recycle, thus increasing the participation rate. By doing so the amount of recycled material is increased.

Commercial recycling

In Marion County, commercial trash collection is franchised, but commercial recycling is outside of the County's franchise system and is arranged between the generator and hauler. Each of the nine franchise companies that make up the Mid-Valley Garbage and Recycling Association offer commercial recycling collections as part of their services as well as independent recycling. Wastes from some industrial customers may also be accepted, as long as they meet the criteria of municipal solid waste.

Many businesses in Marion County have a recycling program, even though they are not mandatory. The number of businesses recycling and the materials being collected varies from business to business and area of the County. Haulers work with businesses to specifically design a program that is right for them. Haulers offer collection container services from 90-gallon roll carts to 40-50 yard drop boxes. Typically, drop box service is offered to construction companies to collect recyclable materials such as: scrap lumber, scrap metal, corrugated cardboard, construction and demolition material, asphalt and concrete, wood pallets, saw dust, sod and grass stripping, wood and cedar shakes, and yard material. Smaller containers are most often used inside and outside office buildings to collect corrugated cardboard, white office paper, mixed paper, newspaper, and cans, glass and plastic containers.

PWES is not able to easily quantify how much recyclable material is being collected from businesses as most haulers have routes where they collect from both residential and business customers. PWES does, however, use television and radio advertising to continually promote business recycling. Currently, a sub-committee of SWMAC is surveying 20 businesses that represent a cross-section of Marion County's business community to get a better understanding of what recycling needs businesses might have and how better to promote the benefits of implementing a recycling program.

There appears to be more opportunity to expand commercial recycling efforts and many of the necessary elements are in place. There is a desire by PWES and the franchised collection companies to recycle more commercial waste. Also, Mid-Valley Garbage and Recycling Association has constructed a material recovery facility that is capable of increasing recycling processing levels and expanding to meet future demand.

However, as mentioned previously the County only has the authority to develop and implement programs in the unincorporated areas. The franchised collection companies

must enlist the support of each local jurisdiction in order to design and implement a commercial recycling program in the local area.

Drop-off facilities

To augment curbside collection, there are recycling depots throughout the County where citizens may drop-off designated recyclable materials. These facilities, for the most part, are operated and serviced by the local franchise collection companies. They are as follows:

D&O Garbage Service, Inc.
1140 Boone Road SE
Salem, Oregon

Accepted Materials: Cardboard, Dry Cell Batteries, Glass, Magazines, Newspaper, Plastic Bottles, Tubs/Trays #1-7, Plastic Milk Jugs, Scrap Metal, Tin & Aluminum.

Open for Recycling: 7 days per week – 24 hours per day

Garten Services, Inc.
3334 Industrial Way NE
Salem, OR

Accepted Materials: Cardboard, Newspapers, Magazines, phone books, other Mixed communication and packaging papers, milk cartons and drink boxes, glass containers, tin cans, household aluminum, and rigid plastic containers (bottles and tubs).

Open for Recycling: 7 days per week, 24 hours per day.

Loren's Sanitary Service, Inc.
1141 Chemawa Road
North Keizer, Oregon

Accepted Materials: Cardboard, Dry Cell Batteries, Glass, Grayboard, Latex Paint, Magazines, Motor Oil, Newspaper, Plastic Bottles, Tubs/Trays #1-7, Plastic Milk Jugs, Scrap Metal, Tin & Aluminum.

Open for Recycling: 7 days per week – 24 hours per day

Marion Recycling Center, Inc.

3680 Brooklake Road NE
Salem, Oregon

Accepted Materials: Cardboard, Glass, Grayboard, Magazines, Mixed Scrap Paper, Newspaper, Office Paper, Plastic Bottles, Tubs/Trays #1–7, Plastic Milk Jugs, Tin & Aluminum. The Marion Recycling Center also accepts commingled recyclables (with the exception of glass, which must remain separate).

Open for Recycling: Monday through Friday – 7 am to 3 pm

North Marion County Disposal Facility (NMCDF)

17827 Whitney Lane NE
Woodburn, Oregon

Accepted Materials: Cardboard, Glass, Grayboard, Magazines, Mixed Scrap Paper, Motor Oil, Newspaper, Office Paper, Plastic Bottles, Tubs/Trays #1–7, Plastic Milk Jugs, Scrap Metal, Telephone Books, Tin & Aluminum.

Open for Recycling: Monday through Saturday – 8 am to 5pm. Closed major holidays.

Pacific Sanitation Service, Inc.

3475 Blossom Drive NE
Salem, Oregon

Accepted Materials: Cardboard, Dry Cell Batteries, Glass, Grayboard, Latex Paint, Magazines, Mixed Scrap Paper, Motor Oil, Newspaper, Office Paper, Plastic Bottles, Tubs/Trays #1–7, Plastic Milk Jugs, Scrap Metal, Tin & Aluminum.

Open for Recycling: 7 days per week – 24 hours per day

Salem/Keizer Recycling & Transfer Station (SKRTS)

3250 Deerpark Road SE
Salem, Oregon

Accepted Materials: Appliances, Car Batteries, Cardboard, Computer Components, Cardwood for Donation, Dry Cell Batteries, Fluorescent Tubes, Glass, Grayboard, Latex Paint, Magazines, Mixed Scrap Paper, Motor Oil, Newspaper, Office Paper, Plastic Bottles, Tubs/Trays #1–7, Plastic Milk Jugs, Telephone Books, Scrap Metal, Tin & Aluminum and St. Vincent DePaul Donations.

Open for Recycling: 7 days per week – 8 am to 5 pm. Closed major holidays.

Santiam Sanitary Service, Inc.
9603 Mill Creek Road SE
Aumsville, Oregon

Accepted Materials: Appliances, Cardboard, Dry Cell Batteries, Glass, Latex Paint, Magazines, Motor Oil, Newspaper, Plastic Bottles, Tubs/Trays #1–7, Plastic Milk Jugs, Scrap Metal, Tin & Aluminum.

Open for Recycling: Monday through Friday – 8 am to 5 pm; Saturdays – 9 am to 4 pm

Suburban Garbage Service, Inc.
6075 State Street
Salem, Oregon

Accepted Materials: Cardboard, Dry Cell Batteries, Glass, Grayboard, Magazines, Mixed Scrap Paper, Motor Oil, Newspaper, Plastic Bottles, Tubs/Trays #1–7, Plastic Milk Jugs, Scrap Metal, Tin & Aluminum.

Open for Recycling: 7 days per week – 24 hours per day

United Disposal Service, Inc.
339 Wilson Street
Silverton, Oregon

Accepted Materials: Appliances, Cardboard, Dry Cell Batteries, Glass, Latex Paint, Magazines, Motor Oil, Newspaper, Plastic Bottles, Tubs/Trays #1–7, Plastic Milk Jugs, Scrap Metal, Tin & Aluminum.

Open for Recycling: Monday through Saturday – 9 am to 5 pm

United Disposal Service, Inc.
2215 North Front Street
Woodburn, Oregon

Accepted Materials: Appliances, Cardboard, Dry Cell Batteries, Glass, Grayboard, Latex Paint, Magazines, Motor Oil, Newspaper, Plastic Bottles, Tubs/Trays #1–7, Plastic Milk Jugs, Scrap Metal, Tin & Aluminum.

Open for Recycling: Monday through Friday – 8 am to 5 pm

Valley Recycling & Disposal, Inc.
2515 Salem/Dallas Highway NW
Salem, Oregon

Accepted Materials: Cardboard, Glass, Magazines, Motor Oil, Newspaper, Plastic Bottles, Tubs/Trays #1–7, Plastic Milk Jugs, Tin & Aluminum.

Open for Recycling: 7 days per week – 24 hours per day

In addition to the drop centers, the franchised companies sponsor other events aimed at collecting source-separated materials. One of the higher profile business recycling programs supports the DARE program, a program designed to help keep children off of drugs. There are four businesses and 15 schools that participate in a newspaper and magazine collection program where all the proceeds from the sale of the recyclables go to fund the DARE program. At present, there are 19 container locations throughout Marion County. There are also some drop centers in the County that are not affiliated with franchisers, including Clayton-Ward Recycling Center and Garten Services in Salem.

Special waste collections

There are several programs for collection/drop-off of “special wastes” in Marion County.

- Latex Paint – Local garbage haulers collect latex paint as part of the city curbside collections in Marion County
- PVC – Every year in April, PWES offers a free disposal day for PVC plastics. Individuals can take them to either the recycling center at the Salem-Keizer Recycling and Transfer Station or the Brown’s Island Demolition Landfill.
- Green Waste – Green waste (garden, food and wood waste), including pre-consumer or uncooked food scraps, are collected from businesses, such as grocery stores and restaurants. These food scraps are taken to Wood Waste Reclamation in Aumsville, where they are composted.
- Computer Recycling – Individuals can drop-off their old computer components at the Salem-Keizer Recycling and Transfer Station for recycling.
- Fluorescent Light Bulb Recycling – Residents can take up to 10 residential fluorescent light tubes or bulbs to the Salem-Keizer Recycling & Transfer Station and drop them off for recycling at no charge.
- Household Hazardous Waste (HHW) – In 2000, PWES sponsored and funded two household hazardous waste collection events, serving over 200 residents at the Stayton event and 75 residents at the Silverton event. Marion County residents are encouraged to reduce the amount of HHW generated. The County has developed

information and promotional materials for general distribution to educate the public regarding products that can be used as alternatives to those containing hazardous materials. In addition, residents are encouraged to purchase hazardous products in only those quantities that will likely be used so as to avoid disposal of excess amounts. The types of materials targeted include solvents, pesticides, household cleaners, paints, and similar materials. PWES has completed a comprehensive HHW management plan which is included for informational purposes (Appendix B).

PWES has also implemented a mercury thermometer exchange program. Individuals can take their old mercury thermometers to SKRTS and exchange them for new digital thermometers. PWES then sends the mercury thermometers to a company for recycling.

- Styrofoam – PWES advertises and promotes periodic Styrofoam collection day. Marko Foam Products, Inc. of Wilsonville collects and removes all materials.
- Appliances – Unwanted appliances are currently accepted for recycling at transfer stations.

Other waste recycling

Tires

Recycled tires can be used in a variety of ways including tire derived fuel (TDF), reuse as tires, rubber chips for civil engineering projects (retaining walls, fill, fence construction), and fill at solid waste facilities. The demand for scrap tires is increasing. In 2000, 200 million of the 276 million scrap tires generated were recycled (Blumenthal 2001). The demand for scrap tire is expected to continue to grow. The potential development of new technologies to break tires down to other usable materials may add to the demand. These technologies include: pyrolysis, in which tires are broken down to oil, gas, carbon black, and steel; devulcanization, which extracts rubber products that can be used to manufacture new tires; and gasification, which processes tires into gaseous fuel.

In Oregon, tires can be disposed of through Tire Disposal and Recycling, Inc. (TDR), a private company that owns facilities to collect and process used tires. TDR has two facilities in Oregon: one in Clackamas and one in Prineville

Although tire demand appears to be increasing nationwide, there has been a recent decline in tire recycling in Oregon. Only 33 percent of discarded tires were recycled in 1999, compared to 83 percent in 1995. To address this, the state Task Force on Tire Recycling was established by the Governor in June 2001 under House Bill 3908. The purpose of the Task Force is to investigate markets for tire recycling. The task force is made up of various stakeholders including representatives from state and local government, industry, and the non-profit sector.

Agricultural waste

Agri-Plas, Inc. is a privately owned agricultural products recycling center located in Salem. Agri-Plas receives unwanted plastic materials from farming and nursery operations, including pots, starter trays, nursery film, seed bags, and baling twine. These materials are not accepted by conventional recycling facilities and have traditionally been burned or buried. Materials are sorted and processed (including hand cleaning, grinding, and aspirating) on site, then shipped to manufacturers. The recycled materials are used in manufacturing a number of products including nursery pots, seed bags, and filler for bitumen roofing. Last year, 3.5 million pounds of discarded plastic products from 41 nurseries were processed by Agri-Plas. Agri-Plas received a grant from Marion County in 2001 to fund a position for an employee to travel to nurseries teaching staff how to properly sort materials and prepare them for shipment to recycling facilities. More materials throughout Marion County and the state could be received and processed at Agri-Plas if these facilities were expanded and if more people in the industry were educated about the service.

3.1.4 Composting

One significant program implemented as a result of the 1995 SWMP, was the establishment of yard debris and wood waste compost program. From 1995 to 2000, the amount of material recovered grew from less than 10,000 tons to more than 40,000 tons. This increase was accomplished through the efforts of the County, working in conjunction with haulers and the cities, to implement curbside collection of yard waste.

WWR in cooperation with the County expanded their compost operation. They operate under an ODEQ commercial composting permit on a 10-acre site within the city limits of Aumsville. The facility composts over 30,000 tons of yard debris and wood waste each year.

A further development in Marion County composting operations was the construction of the four-acre Brown's Island Compost Facility. The facility, located adjacent to the Brown's Island Demolition Landfill in southwest Salem, opened in December 2000. The Brown's Island Compost Facility primarily accepts yard debris collected during city cleanups held throughout the year, but also receives some yard wastes from local park clean-ups. The compost produced at the facility is utilized on-site for the agricultural field, which lies adjacent to the Willamette River.

3.2 Needs and Opportunities

The state of Oregon has increased Marion County's targeted recovery rate from 44 percent to 54 percent by 2009. To achieve the 2009 goal, the County must sustain current recycling levels while striving to seek growth in the amount of materials recovered. The County program must include the following:

- Continue to receive the 6 percent waste reduction credits by maintaining comprehensive waste prevention promotion and education programs;
- Continue to budget sufficient funds and dedicate resources at current levels in order to execute these programs;
- Increase participation levels in current programs; and,
- Offer new services to customers that present the greatest potential to increase the amount of recovered materials.

Based on discussions with franchised collection companies and from research of other programs there are several specific areas that could contribute to meeting this new goal. These areas are:

1. Increase participation in residential collection programs;
2. Further evaluate recycling opportunities with multi-family units;
3. Increase opportunities to recycle more material generated by commercial generators.

Expanding commingled collection could encourage increased residential participation. Commingled collections are easiest on residents, as they are not required to separate the materials they set out for recycling, and higher participation is expected in areas with existing programs.

Multi-family recycling is limited in Marion County. In some places, multi-family housing units have centralized areas where recycled materials can be deposited, but many multi-family units have no on-site facilities. Currently, grants are awarded to property management companies that want to provide an opportunity to recycle for their residents. In most cases, multi-family residents must use recycling drop-off centers to dispose of their recyclables. Participation in recycling, by multi-family residents, can be increased by implementing a program that is on-site and convenient for multi-family residents.

Other tools are available that may be used to increase waste recovery rates include single-stream collections, pay-as-you-throw programs, or other rate incentive programs, and government mandates. In single-stream collection programs, customers do not separate recyclables from waste; workers remove recyclables after waste is collected. This could increase recycling rates, since most recyclables could potentially be removed from the waste stream. Pay-as-you-throw and rate incentive programs raise awareness among individuals on the cost of waste collection and disposal and the available recycling alternatives. Government mandates could increase recycling participation by penalizing customers for non-compliance with recycling requirements. The County generally prefers to use incentive-based programs, rather than regulatory programs, however. The residential recycling programs described here are discussed in more detail later in the Chapter.

Other programs that can be expanded include business recycling, food and yard waste recycling, and construction and demolition (C&D) recycling. The county is funding a program through Garten and the haulers to fund an individual to solicit and facilitate the

set up of business recycling programs in multi-tenant facilities requiring the coordination of many different entities. It is operated under the name of “SCOOP” or “Saturated Collection of Office Paper”. This program, and others like it, could be expanded to increase recycling in the commercial sector. It has been estimated that the Wood Waste Reclamation (WWR) facility is processing approximately 75 percent of yard waste generated in Marion County, but only 52 percent of the food waste. Food waste represents 10 percent, or over 22,000 tons of County waste that is disposed in landfills. WWR has excess capacity that is not currently being utilized, and more of this material could be composted at the facility. Also, because the cost to dispose of waste at Coffin Butte Landfill is less than using facilities in the Countywide system, some C&D material is leaving the County. Recycling could be increased by processing these materials at one of the County’s facilities.

Participation and recycling rate increases may result from program improvements that simplify the process, reduce the cost to recycle the material, and/or otherwise provide incentives for participants to recycle. Certain cities and their franchised haulers have already started initiatives, such as commingled collection of recyclables that are expected to increase waste quantities diverted to recycling. The County must also continue to promote waste reduction programs where residents are educated on the use of improved packaging, nontoxic household products, and reusable products.

3.3 Alternatives for Increased Waste Reduction, Reuse, and Recycling

There are several opportunities whereby the County can achieve gains in waste reduction, reuse, and recycling. The following alternatives are discussed as methods to increase participation and recover more materials. The alternatives are aimed at growing the recycling rate from the current 38 percent to as much as 45 percent.

3.3.1 Alternatives to Increase Participation

Commingled recyclables collections

Commingled recyclable collections involve residents mixing designated recyclables in one container or bag. Commingled collection is one of the most convenient methods for residents to set out their recyclables and almost always results in higher levels of participation as compared to programs where residents are required to separate materials. Some communities have reported a 20 percent increase in participation as compared to their curb sort program. The City of Portland moved to commingled recycling in October 1999 and also saw an increase in materials recovered. In the first six months of the program, the recycling rate increased 15 percent from the previous year. The percentage of unrecoverable material (residuals) received at the recycling centers was also low; only 2 percent of materials received were later transported to landfills (City of Portland 2000).

Although effective, commingled collections also offer certain challenges:

- More labor is involved to separate materials at the processing facility once collected
- Additional equipment is needed at the processing facility
- Some glass breakage may result

As described above, the City of Keizer has already begun to implement a commingled collection system. In the first three months of commingled collection, Keizer's recovery rate increased to 40 percent, compared to 15 percent during the same time period in the previous year (reported by Mid-Valley Garbage and Recycling Association). It should be noted that the recovery rate was measured during the peak time of year for waste generation (June, July, and August). Increases in the recovery rate may not be as dramatic at other times of the year, however.

Now that Marion County has a mature recycling program, with a large number of its residents recycling, the County could more easily convert areas with separated recyclables to commingled collections. If the entire County were to use some form of commingled collection and Marion County experiences the same success that other communities have, the amount of materials recovered could be significantly increased.

Commingled collection results in increased labor requirements for separation of materials at recovery facilities, though this does not necessarily result in higher costs. Because items do not have to be separated at the curb and in some cases automated trucks may be used, collection labor decreases for commingled recyclables. This can more than compensate for cost increases from sorting demands at the facility. In the City of Portland, the move to commingled recycling has resulted in an overall decrease in collection costs (City of Portland 2000).

Single-stream collection

Single-stream collection is a method of collecting both trash and recyclables together at one time. This approach can help improve collection efficiencies, while at the same time give municipal recycling programs the opportunity to expand the materials they collect and increase their diversion levels. Educating residents on a single-stream collection is straightforward, as a municipality no longer has to promote what is and is not acceptable and how to separate items. Further, contamination becomes virtually a non-issue to the generator, as it is handled during the post-collection sorting process. As markets improve, the municipality can add new items to its list of recyclable commodities. Fuel savings from single-stream collections can be significant, as the collector is able to run trucks fewer hours to pick up the same number of households.

There are, however, certain challenges to overcome when implementing a single-stream program. These include:

- Additional costs associated with separating materials at the processing facility

- Lower paper quality as compared to source separated program
- Additional equipment needed to implement a program may be cost prohibitive

Rate incentives

Volume based rates, i.e., Pay-As-You-Throw (PAYT)

Pay-as-You-Throw (PAYT) trash collection programs are popular throughout the United States and almost certainly result in an increased level of residential recycling and decrease in waste generation. There are currently over 4,000 communities in the United States with some form of PAYT program in place (Canterbury 1998). Several communities in Marion County currently incorporate a version of PAYT in their neighborhoods as the service providers offer different trash container sizes and/or levels of service for different rates.

PAYT programs are designed so that households are charged for the amount or volume of trash they generate each week as opposed to each household paying the same trash collection fee. PAYT programs come in many different forms, but they most often involve some base level service, with additional levels costing extra. Some examples include:

- One bag or can per week for a designated fee, with an additional charge for each additional bag or can.
- No minimum set-out; each bag or can has a set price associated with it.
- Different size cans have different weekly collection charges assigned to them; residents are free to choose the level of service they want.

PAYT programs are successful as residents become more aware that they have a direct impact on how much they will pay for trash collection costs. Oftentimes, individuals will change their buying behavior so that they buy products with less packaging and will learn about their recycling alternatives. Greater recycling occurs when there is a fee charged for trash collection service and recycling service is free.

The challenges of implementing a PAYT program include:

- The program can be controversial
- The program will require increased management and administration
- There may be additional equipment needs both in the field and for billing

Current rate structures may provide some incentive to recycle. Whether these rate structures can be modified to create additional incentives could be evaluated.

3.3.2 Expand Collection Programs/Services

As discussed previously there appear to be opportunities to expand certain collection programs targeted to some customers. These programs include multi-family recycling, rate incentives, and commercial recycling. Some recycling programs currently exist that serve multi-family housing residents and commercial businesses. These programs do not reach all sectors of the population, though, and expansion of services could increase the number of residents that participate in recycling. Approaches to expansion of these programs and services are discussed in more detail in this section.

Multi-family recycling

Data from the 1990 U.S. Census indicated that there were 18,012 multi-family units in Marion County (Oregon State University, Government Information Sharing Project, 1990). The current multi-family recycling program in Marion County is voluntary, and many units do not offer recycling services to residents. Expansion of these services would provide an opportunity to increase recycling rates. With a properly designed and promoted multi-family recycling program, Marion County could reasonably expect to recover approximately 280 pounds of commingled recyclables per multi-family household per year (USEPA 1999).

Multi-family recycling can be implemented using various types and sizes of containers (wheeled carts, dumpsters, and sectional roll-offs). In some multi-family complexes, the property management companies pick the types of containers to be serviced while in other complexes, the participants have one standardized container type for all properties. In all cases, multi-family programs prove more successful when there is a “partnership” between the housing complex and the waste hauler.

There are several ways to increase multi-family resident participation in recycling programs. These techniques can be more easily facilitated when the multi-family complex management takes ownership of the program. It is important that the accepted materials message be reinforced at several locations throughout the complex so that residents know what is and is not acceptable. To avoid confusion, it is helpful to collect the same recyclables and promote the same recycling message that is given to single-family residents, if possible. Convenience is a key to a successful multi-family recycling program. Recycling containers placed near trash receptacles are more visible and offer the residents an alternative to throwing recyclables away in the trash. Centralized sites may be less convenient and often result in lower participation, but may realize a smaller level of contamination as well.

County-sponsored programs, where containers and/or collection service are provided, would give the County more control over the multi-family program. When the recyclables storage containers and/or collection service is free and trash collection prices are set high for non-participating multi-family communities the multi-family complex has an incentive to recycle.

Some challenges to overcome when implementing a multi-family recycling program include:

- Space/logistics
- High contamination perception
- Multi-family management turnover
- Resident turnover
- Perception that monitoring program is time consuming
- Perception that containers will be destroyed or stolen

Multi-family programs can be implemented using a “phased” approach. The property could start with paper recycling and later phase in the commingled container commodities, such as cans, glass, and plastic. Paper recycling is the easiest message to promote to residents, and it also provides the greatest recycling tonnages, with limited contamination issues. When commingled collections are implemented, they should be done in a separate container. Having residents combine cans, glass, and plastics in any color “see through bags” can minimize glass breakage as much as seven fold compared to items mixed loose.

Without having the support of the local jurisdiction it is difficult to implement new collection programs. In discussions with the Mid Valley Garbage and Recycling Association, certain franchised haulers have indicated a desire to pursue collection of recyclables from multi-family units. One challenge they face is structuring their agreements to allow for added services along with a corresponding ability to develop a fair rate schedule for new services. Many of the cities that manage franchise agreements do not have the resources to assist with developing new programs.

Commercial recycling

As described in section 3.1.3, commercial recycling in Marion County is not managed by the County, but is coordinated between commercial businesses and haulers. The County’s role in commercial recycling is to promote opportunities and to encourage participation. Though some success has been realized in involving businesses in recycling programs, opportunities exist to expand participation. Challenges in promoting a greater commercial recycling program include stimulating interest in the program by businesses and administering the program with limited County staff resources.

There are a number of businesses that currently help PWES promote the “Buy Recycled” campaign and others that have taken advantage of PWES’ free business waste audit and technical recycling support service. Businesses that have taken advantage of PWES’s waste audits have realized significant benefits, including cost savings, though the number of participants has been low. Marion County, with assistance from the business community, could further promote the business waste audit program and technical recycling support service to encourage more businesses to use this service. Highlighting the benefits experienced by past program participants could help to stimulate interest in the program.

One approach to implementing an effective business recycling program when staff resources are limited is to target business types and/or recyclable items. The County would best be served by working with the franchised haulers to design a program and develop a list of targeted materials and businesses to approach. The haulers understand collection logistics for the proposed businesses, estimated generation quantities, and best method for collection (see Table 3-2 for a list of businesses and potential material recovery estimates). The County, with the haulers' assistance, could forecast how much recyclable material it could recover.

Several jurisdictions in the Country have found it effective to promote business recycling on a regional basis. Rather than an individual jurisdiction using its limited resources, the community can pool its resources with neighboring communities to create a far-reaching program. Often, a standardized message can be created and promoted using such media outlets as radio, television and newspaper advertising. In this way, the communities are able to increase public awareness and education.

**Table 3-2
Potential Material Recovery (by Business Sector)**

Business Sector	Targeted Material	Percentage of Waste ¹
Office	Mixed paper	26.7
	Newspaper	6.8
	Corrugated containers	8.3
Wholesale/Retail	Corrugated containers	19.1
	Film plastics	6.6
	Food wastes	20.9
Food/Entertainment	Newspaper	4.9
	High grade paper	3.6
	Corrugated containers	10.5
	Mixed paper	8.9
	Food wastes	38.1
Service	Corrugated containers	11.4
	Mixed paper	13.6
	Wood waste	4.2
	Tires and rubber	3.6
	Household hazardous waste	1.4

¹ Percent by weight of material in total waste stream for that category.

Source: Hinshaw and Braun 1991

Business roundtables have been created where business leaders and recycling professionals meet to address challenges and recycling opportunities available to businesses. These roundtables may meet on a frequent basis and may be facilitated through organizations such as PWES of Solid Waste, local Chamber of Commerce, or Economic Development Office. The meetings may involve presentations by business owners highlighting their successes, recycling professionals presenting case studies from other areas, and materials marketing professionals that can address the economic benefits of recycling certain commodities.

Other areas of the country have found that creating business incentives to promote commercial recycling helps to increase business participation. Some jurisdictions provide tax breaks, while others provide perks like quick licensing and permitting programs.

3.3.3 Expand Targeted Materials

Two categories of waste have been identified as potential targets for recycling gains: yard and food waste collections and construction, demolition, and land clearing waste.

Yard and food waste collections

Yard waste diversion to composting contributes significantly to a municipality's recycling rate. In Marion County, there are several communities that have begun curbside yard waste and food waste collections. Marion County should work to expand the number of households served with yard waste collections and increase the frequency of collections. Yard waste bans at landfills are typically the tool many jurisdictions use to promote yard waste collections.

Food waste collections from businesses such as restaurants and grocery stores could be expanded in Marion County. By weight, food waste is one of the largest recyclables generated at these establishments. With the increased yard waste composting operations in the County, vegetative food waste can be incorporated into the mix of materials being composted. WWR is already receiving certain vegetative food waste, including vegetable waste and produce waste. Much of this waste is picked up by commercial haulers from selected restaurants and grocery stores along their routes. The challenges of increasing yard and food waste collections and successful composting of the material include:

- Need for more collection equipment
- Increased promotion efforts
- Possible need to expand processing facilities
- Too much rainfall in Marion County to allow certain green waste to be windrow composted
- Potential for contamination from certain non-vegetative food waste that may be slow to decompose and may contribute to increased odors

Compost from yard and food waste generally continues to have a strong market throughout the Country. It is reported that there are good outlets for compost and mulch

in Marion County and the greater Portland area that would support increased composting in Marion County.

Construction and demolition waste recycling

Construction waste is a mixture of packaging, excess or trimmed materials, and residue from construction activities. Demolition waste contains components of structures resulting from partial or complete demolition. Generators of either waste type typically store the waste in roll-off style, open top containers having 20 to 40 cubic yard capacities.

The amount of C&D generated in Marion County is not reported. Most of the C&D is disposed of at landfills outside of Marion County. However, Marion Recycling recovers some C&D material, primarily wood and corrugated cardboard at the new MRRF in Brooks. The MRRF offers the County significant capacity for added C&D recovery. Major C&D waste constituents that are recycled at other facilities in the United States include asphalt roofing shingles, gypsum wallboard (dry wall), wood, metals, corrugated containers, asphalt pavement, and concrete pavement.

Facilities that receive mixed C&D waste must be capable of processing large, heavy items, such as lumber, brick, concrete block and mortar, and various types of metal. C&D waste processing systems have been designed to address specific characteristics of the materials received in loads. Using a combination of manual separation, mechanical separation, and handling by large equipment, C&D waste recycling systems are able to recover significant portions of materials received. These recovered materials can often be sold to local markets. Some facilities receiving mixed C&D waste report recovery and marketing and/or beneficial use of over 75 percent of the C&D waste received for processing.

With certain policy and/or legislative incentives to provide for expanded C&D recovery and market development, a greater diversion of C&D materials to this facility could be achieved. Two examples of such programs, in the cities of Portland and Palo Alto, are described below.

In the City of Portland an ordinance was passed that requires construction companies with building projects over \$50,000 to ensure that certain materials generated in the job site are recycled. The general contractors must submit a completed "Pre-Construction Recycling Plan Form" to the Solid Waste and Recycling staff within two weeks prior to the start of the building project. By completing and signing this form, the contractor understands that he is legally required to set up a recycling program for the following materials generated at the construction site: rubble (concrete/asphalt), land clearing debris, corrugated cardboard, metals, and wood. Failure to comply with Portland's ordinance is ultimately subject to a penalty of up to \$500 for the first violation.

Similarly, in Palo Alto, California, the City requires construction companies with projects over 10,000 square feet involving construction, remodeling or demolition, to submit a "solid waste management and recycling plan" to public works staff for review and

approval. As part of this plan, the company must identify the construction and demolition material that will be generated and a method for diverting a minimum of 25 percent of the material from landfills. During the actual construction/demolition process, the contractor must use the City's Waste Management Report forms to document: (1) volume or weight of each type of recycled material and where they are processed and (2) volume or weight of all materials disposed (landfilled) and where they were taken. At the completion of the project, the construction and/or demolition company must submit the Waste Management Report forms to the City Building Inspector before the permit can be signed as complete. The Inspector will submit documents to the public works staff where a review of project documents will be tallied and compared to original planned estimates. Failure to provide satisfactory receipts or accomplish plan estimates could encumber approval of future permits for the construction company.

Other jurisdictions have similar legislative policies; however, they require substantial security deposits at the start of the project. These deposits are refunded at the end of the project, once proof of C&D waste recycling has been provided and verified.

3.3.4 Other Alternatives

Potential techniques for expanding recycling that do not fall into the categories above are described in this section. Two options discussed here are the creation of government mandates and promotion of the "Buy Recycled" campaign.

Government mandates

Government recycling mandates have proven effective in raising some communities' recycling rates. Recycling rate increases may differ based on the types of mandates that are initiated. Possible types of implementation include mandates for:

- businesses of a certain size to recycle a certain percentage or certain type of waste
- multi-family housing communities and businesses to provide the opportunity to recycle to their residents and tenants
- residents to recycle (whereby trash won't be picked up if recyclables are found)
- businesses (or businesses of a certain size, say 50 employees or more) to report their waste reduction and recycling activities on an annual basis

Although mandates can work, they are typically only as strong as the enforcement that goes into them. Other possible drawbacks of mandates include:

- May create tension between government and the community
- Additional staff requirements
- Enforcement legislation required
- Perceived added level of bureaucracy

Buy recycled

Marion County has a strong “Buy Recycled” campaign in place. This program may be strengthened by further promotions and education. It is important that individuals and businesses understand what products are made with recycled content and where they can buy these products. The County could lead by example by promoting its “Buy Recycled” efforts in various media venues. The County might consider listing the types and quantities of the products it purchases that meet these criteria. Items may include, but are not limited to: paper products, refurbished equipment and automotive products, janitorial supplies, trash can liners, printer cartridges and products made of plastic lumber. The County could also increase the “Buy Recycled” program in the future by including ongoing training for purchasing department personnel, identification of new “recycled” products, development of standardized specifications, and promotion of cooperative regional purchasing.

3.4 Recommendations

Marion County has the infrastructure in place to address all of the major components of a comprehensive recycling program. In fact, some of the County’s program features are quite progressive. Future increases to the County’s recycling rate will be a result of expansions or enhancements to existing programs.

There are several areas that should be targeted to meet the State’s recycling goal of 54 percent by 2009. They are as follows:

Recommendation 3.1: The County should continue to budget funds and allocate resources needed to execute current promotion /education programs and to support existing services.

Rationale for Recommendation: PWES budgets between \$700,000 and \$900,000 for waste prevention/reduction, reuse, and recycling programs and services. PWES also provides two positions or full time equivalent (FTE) who are responsible for managing these programs. These resources are in addition to direct services offered at certain facilities. This level of effort is needed in order to sustain the current recycling rate. In addition, these programs provide a foundation that can be built upon as the overall countywide program expands. To ensure success of the programs, Department employees should communicate with stakeholders throughout the planning and implementation phases. Stakeholders include citizens, businesses, managers of multi-family residences, collection franchise owners, city officials, and other government entities.

Recommendation 3.2: Marion County along with the cities, franchised haulers, and other stakeholders should continue to develop and expand collection of commingled materials.

Rationale for Recommendation: The County should realize greater participation by its residents and greater tonnages collected by increasing the coverage of its commingled collection area. Commingled collections make the process of recycling easy on residents. It is easy to understand and takes little time to participate.

Commingled collection in roll carts is also more efficient and easier for haulers to manage. The County should consider reducing the frequency of collections or dropping its weekly “red bin collections” of special wastes, such as latex paint, motor oil and batteries; these items could be collected at depots or drop-off points. This program modification would allow for haulers to collect recyclables using a semi-automated or automated collection program. By making this change, haulers may be able to free up time and resources for other recycling efforts in the County thus giving the County the ability to capture more recyclables.

Based on results in other communities with successful commingled collection, the County could expect to recover approximately 1,000 pounds of commingled materials per household per year from participating households. Using results from similar programs the County could experience an increase of between 15 percent and 20 percent in the amount of materials recovered.

Recommendation 3.3: The County should investigate single-stream collection. A pilot program to evaluate the feasibility of single-stream collection could be considered in the future.

Rationale for Recommendation: As described in this chapter, single-stream collection has the potential to allow for greater residential recycling while decreasing fuel costs. Although single-stream collection may generate more recyclables than other curbside collection methods, some challenges exist. Initial costs for new equipment and increased costs in separating materials at a processing facility could make single-stream collection cost prohibitive. Also, the quality of paper recyclables could be compromised by single-stream collection. Further study of single-stream collection is warranted to determine if challenges can be overcome.

Recommendation 3.4: Marion County should establish a task force to evaluate alternative approaches for developing a multi-family collection program. The task force should include representatives of various cities and local haulers, who would consider changes in the franchise agreements needed to implement these services. A pilot project should be implemented for the purposes of evaluating the most effective methods and for demonstrating the advantages of this program to other jurisdictions and to owners/managers of multi-family properties.

Rationale for Recommendation: There are few multi-family properties throughout Marion County with recycling programs. The expansion of multi-family recycling efforts Countywide may require the combined efforts of local jurisdictions along with the franchised collection companies. A significant effort may be required during the implementation stage to coordinate new programs, which may take a year or two.

With a number of multi-family properties located in incorporated cities, it is important that the County gets cooperation from the cities to promote and reinforce the County's recycling efforts. However, cities have limited resources dedicated to solid waste and recycling programs. Therefore, the County will need to take the lead. One mechanism used to aid in forging a cooperative arrangement with cities might be the establishment of a task force. Logistically, it may be easier to implement the multi-family program one city at a time. A similar pilot project approach was used successfully by the County to implement curbside collection of yard debris.

Recommendation 3.5: The County, working with Mid Valley Garbage and Recycling Association, should develop a comprehensive approach for expanding commercial recycling programs. This approach could include establishment of pilot projects to collect commingled materials, providing rate incentives and targeting certain business sectors to collect high graded loads that could be sorted at the MRRF.

Rationale for Recommendation: Business recycling can be found throughout Marion County. Currently, recycling programs are most often found at businesses where there is a strong economic incentive to have a program, or the owners and/or managers believe recycling is "the right thing to do." No Countywide program has been implemented to date in Marion County. Similar to the challenges of establishing the multi-family program, franchised collection is managed by local jurisdictions in which the County has limited authority.

A successful Countywide commercial recycling program could increase Marion County's overall recycling rate significantly. There are several highly recyclable materials that compose a significant portion of business waste streams. These items include: mixed papers, corrugated containers, food wastes, and wood wastes.

Recommendation 3.6: Yard and food waste makes up a large percentage of the municipal waste stream, by weight. Marion County should continue implementing its yard waste collection program and integrate, where feasible, the collection and processing of food waste.

Rationale for Recommendation: There is a strong demand for compost in Marion County and the surrounding areas. Any increase in yard and food waste processing into a compost product will help meet this demand. Recovering only 20 percent of the food waste currently disposed at landfills would result in recycling almost 5,000 tons of additional material.

Recommendation 3.7: Marion County should adopt a procedure, possibly including an ordinance, to encourage construction/demolition contractors to prepare a recycling program for projects of a certain size. The County should focus on incentive programs, but could also investigate mandatory requirements. Once the program is developed, the County could approach other cities to enlist support for adopting similar ordinances.

Rationale for Recommendation: Construction and demolition (C&D) projects offer a range of recyclable commodities and reuse opportunities. It is important to establish a strong C&D recycling program in Marion County. PWES staff should work with the permitting department to establish a mandatory C&D recycling program for all of its construction contractors. There are many models PWES can follow when establishing a mandatory C&D recycling program. The program should include, at a minimum: (1) a recycling deposit from the contractor (2) a recycling plan from the contractor with an agreed upon recovery rate (3) a method for verifying the plan goals were met and (4) penalties and enforcement if the plan goals were not met.

2. BACKGROUND AND WASTE STREAM ANALYSIS

2.1 Introduction

This chapter provides updated information about the physical and economic characteristics of the planning area (Marion County). The current solid waste management system is described in terms of the collection system, disposal facilities and recycling programs. An analysis of the current solid waste stream composition and trends in waste generation and recovery rates since the 1995 SWMP is also provided (Parametrix 1995). The chapter concludes with a presentation of waste generation projections.

2.2 Characterization of the Planning Area

Marion County is located in northwest Oregon and comprises a 1,184 square miles bounded to the east by the Cascade Mountains and to the west by the Willamette River. Neighboring counties include Clackamas to the north, Yamhill and Polk to the west, Linn to the south and Jefferson and Wasco to the east. The western half of Marion County lies within the Willamette River Valley, and the eastern half includes the Cascade Mountain foothills. Topography ranges from approximately 150 feet above mean sea level (msl) in the valley to over 10,000 feet msl at Mount Jefferson, located in the extreme southeast corner of the County.

The Willamette River Valley is sheltered from extreme weather by the Coast Range and the maritime climate produces warm, dry summers and mild, wet winters. Average annual precipitation in the Valley area of Marion County is 40 inches per year. In the eastern part of the County, precipitation increases rapidly with elevation and ranges from 100 to 130 inches per year in the Cascades.

The population of Marion County has increased by 24.7 percent since the 1990 Census (Population Research Center 2001). The County now has a population of 284,834. This population resides in a total of 108,174 housing units, with an average household size of 2.70 (U.S. Census Bureau 2001).

Population is generally concentrated in 20 incorporated cities ranging in population from 315 in Scotts Mills to 131,385 in Salem (Table 2-1). Most of the urbanized areas are located in the western half of the County along or near the major road corridors such as Interstate 5 and State Highways 22 and 214. Salem is the largest city in the County, the County seat and the capital of Oregon (Marion County 2001).

Table 2-1
2000 Population of Incorporated Cities in Marion County

Jurisdiction	Population
Aumsville	3,045
Aurora	700
Detroit	380
Donald	755
Gates	555
Gervais	1545
Hubbard	2285
Idanha	370
Jefferson	2,565
Keizer	31,220
Mill City	1,670
Mount Angel	3,030
St. Paul	355
Salem	131,385
Scotts Mills	315
Silverton	6,800
Stayton	6,935
Sublimity	2,580
Turner	1,365
Woodburn	17,840

Source: Marion County 2001

The temperature and climate, abundant rainfall and fertile alluvial soils in the Willamette River Valley, as well as the proximity to markets and transportation systems, have encouraged the development of agriculture. The Willamette River Valley is the most diverse agricultural region in Oregon, specializing in crops such as berries, vegetables, hazelnuts, hops, grass seed and nursery products. Marion County is ranked number one in Oregon with respect to agricultural production. Coincident with the growth of agriculture was the development of the food processing industry, which is now one of the largest in the nation. Valley land is also used for grazing and rearing activities to produce livestock and poultry for market.

The County's unemployment rate was 6.3 percent in 1999 (most recent available year for economic indicators) (Oregon Economic and Community Development Department 2001), higher than the state unemployment rate of 5.7 percent (Oregon Economic and Community Development Department 2000). The economic base includes government, agriculture, food processing, forest products, manufacturing, education and tourism. The top three employment sectors, as reported in 1999 by the Oregon Economic and Community Development Department, are retail trade, manufacturing, and accommodation and food services. Salem has a substantial manufacturing sector consisting of food processing and

paper goods production. These industries typically are associated with high volumes of food and paper waste by-products.

Since completion of the 1995 SWMP, primary sectors of growth have been high tech and health services. Voicestream's call center has opened in the Salem-Keizer area. Kaiser Permanente, one of the largest HMOs in the nation, is expanding two medical centers in Salem. However, with the economic downturn in Asia, growth has not been consistent across sectors during this time. Food processing jobs in Salem have declined since the 1995 SWMP, but there is evidence that the slowdown in employment growth throughout the Willamette River Valley is likely to be brief (Ayre and Floren 2000).

2.3 Description of the Solid Waste System

The solid waste system in Marion County consists of collection, transfer, waste recovery, recycling, composting and disposal facilities and services. Collectively, the facilities and programs in Marion County effectively manage the County's waste and recyclables. This chapter provides an updated description of the major components of the solid waste management system in the County. Some of the smaller recycling facilities or specific programs that are currently in place within the County may not be included. Marion County's solid waste disposal sites, transfer stations, and the Waste-to-Energy facility are shown on Figure 2-1.

2.3.1 Refuse Collection

There are nine private companies that provide collection of municipal solid waste from residences and commercial establishments in Marion County (Table 2-2). Each of these companies is either franchised by the County or by local jurisdictions, under authority granted by ORS 459.125. This same legislation also gives Marion County the authority to:

“Regulate, license, franchise and certify disposal, transfer, and resource recovery sites or facilities; establish and collect license or franchise fees; and otherwise control and regulate the establishment and operation of all public or private disposal, transfer and resource recovery sites or facilities located within the County.”

This authority was granted to enable the County to effectively manage the entire waste stream including that sent to the Waste-to-Energy Facility.

Franchise agreements grant that each company has the sole right to collect solid waste and recyclables from a specified area, as depicted on Figure 5-1 in Chapter 5. Waste haulers are contractually obligated to provide a regular schedule for collection of garbage in all areas of the County and recyclables in urbanized areas. Service charges by the waste haulers are regulated by cities and by Marion County.

2.3.2 Transfer Stations

There are two transfer stations that operate in Marion County. The Salem–Keizer Recycling and Transfer Station (SKRTS) is located southeast of Salem off Highway 22. The site is owned and operated by Capitol Recycling and Disposal under a contract with the County. In 2000, over 20,000 tons of solid waste were delivered to SKRTS (Marion County Department of Solid Waste Management 2001). This represents a slight increase from 1993 when the facility received 18,300 tons (Parametrix 1995). Solid waste received at SKRTS is transferred to the WTEF for processing. In addition to the MSW, recyclables are accepted at SKRTS. Recyclable materials are transported to the MRRF.

**Table 2-2
Private Solid Waste Haulers and Service Areas**

Collection Service	Service Area
Capitol Recycling & Disposal/Drop Box	▪ Salem, Marion
D & O Garbage Service	▪ South Salem/N. Salem
Loren’s Sanitation Service	▪ Keizer Area, Marion
North Marion	▪ Donald, St. Paul, Marion
Pacific Sanitation Service	▪ Keizer, Northeast Salem, Detroit, Idanha, Jefferson, Turner, Mill City, Gates, Marion
Santiam Sanitary Service	▪ Aumsville, Stayton, Sublimity, Salem, Marion
Suburban Sanitary Service	▪ Salem
United Disposal	▪ Aumsville, Aurora, Gervais, Hubbard, Mount Angel, Scotts Mills, Stayton, Silverton, Sublimity, Woodburn, Marion
Valley Recycling and Disposal Service	▪ Northeast Keizer, Marion

Since 1995, improvements have been made to SKRTS. Specifically, the area dedicated for receiving source separated recyclable materials has been greatly enhanced. The facility now has the ability to handle more types of recyclable materials brought in by the public as well as substantially higher quantities. Yard debris and wood waste are segregated and transported to a commercial composting facility for recycling.

The County owns a smaller transfer station at the North Marion County Disposal Facility (NMCDF) that serves the northern-most portion of the County. The facility is operated under contract by Valley Landfill. NMCDF consists of a series of bays to allow cars and pickup trucks to dump waste that will be transported to the WTEF. The facility includes a drop-off area for source separated recyclable materials. In 2000, the facility received 4,525 tons (Marion County Department of Solid Waste Management 2001), slightly more than the 3,300 tons delivered in 1993 (Parametrix 1995).

[Insert Figure 2-1]

2.3.3 Waste-to-Energy Facility (WTEF)

The Waste-to-Energy Facility (WTEF) began operation in 1986. Covanta Energy, formerly Ogden Martin, operates the facility under a contract with Marion County. The plant is designed to burn approximately 550 tons of municipal solid waste per day or about 185,000 tons per year. The facility converts the energy released during combustion to electricity which is sold to the Portland General Electric Company. The WTEF reduces the total volume of waste by 90 percent. Ash residue is taken to the NMCDF where it is buried in a lined landfill cell.

In general, there are sufficient quantities of solid waste from Marion County to supply the plant at peak capacity on an annual basis. In the past, during certain times of the year when waste volumes were lower, small amounts of waste were brought in from outside the County. This trend is expected to continue, but with less frequency as the waste stream grows.

The WTEF has been a reliable operation and continues to meet performance standards. Recently, air quality controls were added to meet new federal standards for mercury and nitrogen-oxides (NO_x) emissions. The current operating contract with Covanta Energy expires in 2014.

2.3.4 Disposal Facilities

Landfill disposal is part of every solid waste system. There are different types of landfill facilities that are designed and permitted to handle different waste streams. The primary type of landfill is one that is designed to dispose of Municipal Solid Waste (MSW). In Marion County, the only landfill permitted to accept MSW is the backup cell at the North Marion County Disposal Facility. The backup cell hasn't been used to date but is being retained for future use. All MSW must either be delivered to the WTEF or taken to landfills outside of the County. Waste in excess of the WTEF's capacity is hauled to Coffin Butte (sometimes referred to as Valley Landfill) in Benton County. Small quantities of MSW are also disposed of at Riverbend Landfill in Yamhill County.

There are two landfills that are permitted to accept limited types of waste in the County. North Marion County Disposal Facility (NMCDF) accepts ash, and the Brown's Island Demolition Landfill (BI) receives certain types of construction and demolition debris.

North Marion County Disposal Facility

The NMCDF is located two miles north of the City of Woodburn. The facility is owned by the County and is operated under contract by Valley Landfills Inc. Until 1998, the landfill accepted small quantities of MSW. Presently, this site is only accepting ash residue from the WTEF. The County also maintains a lined landfill cell for MSW at NMCDF. This cell acts as a backup for the WTEF, if it were not available for some length of time outside of scheduled down time.

The landfill encompasses a total of 94 acres and receives an average of 140 tons of ash residue per day. The current ash landfill cell will be full in 2002-03. A cell adjacent to the existing cell is presently under design and will be constructed in 2002. Each ash landfill cell is designed with a bottom liner to prevent precipitation that enters the cell from migrating into the groundwater. Water that accumulates in the ash cell is called leachate, and is collected and transported to a storage lagoon. The County is currently installing a leachate treatment facility at the site.

This site is projected to have sufficient capacity to dispose of ash residue from the WTEF through the existing contract term with Covanta Energy, which expires in 2014.

Brown's Island (BI) Demolition Landfill

The BI landfill is permitted to accept only inert demolition waste. The landfill primarily receives gypsum wallboard from private haulers in Marion County. The facility also receives roofing tiles, ceramics, bricks, concrete or other inert materials. Since there are no liner systems installed at BI, the landfill is restricted from accepting all other types of waste.

In 2000, BI accepted about 15,000 tons of demolition waste (ODEQ 2002). It is important to note that the County's estimate is closer to 8,000 tons (Marion County Department of Solid Waste Management 2001). Since the County does not weigh the waste stream entering the landfill, it is necessary to estimate the amount of waste by converting from volume to weight. ODEQ and the County use different conversion factors, thus creating the discrepancy in the reported waste stream.

In 2000, the ODEQ granted the County an extension to the permit. This extension allowed the County to expand vertically by adding lifts on top of the current landfill, thus providing more capacity. At current waste flows, BI has sufficient capacity until 2012.

Coffin Butte Regional Landfill

Coffin Butte is a 700-acre site north of Corvallis in Benton County, operated by Valley Landfills, Inc. Coffin Butte accepts waste from four counties amounting to about 300,000 tons per year (Oregon State University, College of Forestry 1999). Coffin Butte received 38,354 tons of waste from Marion County in 2000 (ODEQ 2002) and 39,696 tons in 1999 (ODEQ 2002) (Table 2-3). At the current rate of disposal, this facility is expected to be in operation for approximately 30 to 40 years.

Manufactured products comprise nearly half of the refuse that is received by Coffin Butte. Construction debris and other recyclable materials such as yard debris or concrete account for approximately one quarter of waste received. Coffin Butte does not accept hazardous wastes such as motor oil, tires, batteries, fluorescent light tubes, etc. By recycling yard debris and wood waste, Coffin Butte reduced landfill tonnage by more than 20 percent (Oregon State University, College of Forestry 1999).

2.3.5 Recycling Facilities

There are many private firms and volunteer organizations that participate in the programs to recycle materials from the waste stream. This section describes the primary facilities that receive, process, and market materials produced from collection services.

Garten Services

Garten Services, a non-profit organization, is the largest recycling organization in the County. A variety of source-separated materials are handled at their warehouse and processing facility. A drop off depot is available for mixed paper, newspaper, cardboard, glass containers, tin cans, household aluminum, and rigid plastic containers. Garten operates a collection service for office and print shop papers and coordinates commercial collection of recyclables through the franchised waste haulers. Garten also runs a buy back operation for all the above materials.

Marion Resource Recovery Facility (MRRF)

MRRF is operated as a co-op organization of the franchised collection companies in the County. Initially, the facility was used to segregate construction and demolition waste and recover wood and other materials. The plant was recently expanded in order to process commercial waste loads. Presently, franchised haulers bring commercial loads that contain higher quantities of cardboard, waste paper, and other recyclables to be recovered.

Woodwaste Reclamation (WWR)

WWR is a privately-owned 10-acre composting and wood mulching facility located in Aumsville. WWR receives wood and yard waste from the two transfer stations in the County, franchised curbside haulers, and from self-hauls. All materials received by the facility are composted on site, and finished product is sold to local retailers, wholesalers, and nurseries.

2.4 Projected Waste Stream Quantities and Composition

The Waste Stream Analysis presented here provides a summary of current waste stream generation and composition in Marion County and forecasts future disposal and recycling levels. Marion County waste disposal trends and corresponding historical population data were used to produce a 20-year solid waste forecast (2000-2019). This forecast is used to project the amount and composition of waste generated, processed and disposed in the future. Projected waste flows are critical to the planning for facilities and services in the updated SWMP.

Since 1995, record keeping and reporting methods have continued to develop and improve. The updated plan assembles the best information available and compares it with data from other areas to portray an accurate characterization of the waste stream that will be generated and disposed of in Marion County. The information can be used to examine areas

where programs may be targeted to reduce waste and to recycle more materials. Results can also be used in planning the expansion of existing facilities or construction of new facilities. However, prior to making major investments in facilities or programs further evaluation of the waste stream may be warranted.

2.4.1 Definition

For the purposes of this projection, the total waste stream is defined as tons of solid waste generated in Marion County, which includes both disposed and reused/recycled. Most types of solid waste are incinerated or landfilled, while other wastes are reused, recycled, or disposed of in sites designated for a specific type of special waste. The largest component of the total waste stream is MSW. MSW consists of waste generated by residences, offices, institutions, commercial businesses and other waste generators not producing special wastes. The majority of Marion County's MSW is incinerated at the WTEF and is reduced to ash. Ash is the second largest component of the total waste stream. The management and disposal of this ash regulated differently than MSW. Incinerator ash is considered a special waste. Special wastes also include industrial waste, hazardous waste, infectious wastes, sludges and septic tank pumpings, tires, and recycled waste. Each special waste category has its own characteristics and handling requirements.

All operators that collect and/or process wastes report the amount of recycled materials to ODEQ each year. This includes specific generators that recycle their own waste, as well as all solid waste handling facilities. The result is an annual report, prepared by ODEQ, which summarizes the recovery rate for each county. Recovery rates for each county in Oregon from 1992 to 2000 are listed in ODEQ's 2000 Material Recovery Survey Report (ODEQ 2001a). The recovery rate is defined as the recycling rate plus credits earned by the County for waste prevention, reuse or home composting programs. The recycling rate pertains to the amount of material that is reused or recycled and not disposed of via landfill. The recycling rate (without the credits) is the value shown in the tables in this chapter unless otherwise stated.

Estimates used in this updated SWMP demonstrate a distinction between "disposed" quantities and "generated" quantities. As used in this SWMP, disposed solid waste is considered to be all county solid waste delivered to the WTEF or disposed of at a landfill, in or out of the County, and as reported to ODEQ by the operators. Waste generation is calculated by adding the total waste disposed and the materials that are recycled, as reported to ODEQ.

2.4.2 Historical Solid Waste Data

Generated waste requiring disposal in Marion County is delivered to the WTEF, Brown's Island Landfill, Coffin Butte Landfill or Riverbend Sanitary Landfill. The North Marion County Disposal Facility stopped accepting MSW in June of 1998. The amount of waste disposed at these sites in 1993, 1998, 1999, and 2000 as reported to ODEQ is shown in Table 2-3.

**Table 2-3
Marion County Municipal Solid Waste Received at Disposal Sites (in tons)**

Disposal Site	1993¹	1998	1999	2000
Waste-to-Energy Facility ²	165,897	176,763	174,035	170,950
North Marion County Disposal Facility (closed June 1998) ¹	2,350	113	0	0
Brown's Island Landfill ²	11,780	23,678	19,490	15,069
Coffin Butte Landfill ²	2,191	30,785	39,696	38,354
Riverbend Sanitary Landfill ²	0	2,461	1,519	1,882
TOTAL	182,218	233,800	234,740	222,098³

Sources: ¹1993 data is from Parametrix 1995.

²Marion County Department of Solid Waste Management 2001 (Solid Waste Management, 2000 Annual Report). WTEF totals include in-county waste only.

²ODEQ 2002 (Counting Waste Disposed by Wasteshed).

³ODEQ 2001a (2000 Material Recovery Survey Report).

The majority of material received at the WTEF and the Coffin Butte Landfill is mixed residential and commercial waste, while the majority of the material received at the Brown's Island Landfill is construction/demolition debris (including drywall, asphalt, fiberglass, brick and concrete). Individual self-haulers deliver small quantities of MSW to Coffin Butte and Riverbend.

2.4.3 Waste Stream Composition

The composition of the waste stream is important because it provides the distribution of types and quantities of materials in the waste stream, including recyclable and compostable materials. Information was compiled from several sources to produce the waste stream composition that is summarized in Table 2-4 and in Figure 2-2 (see Source list following Table 2-4 for specifics). The percentage of total waste generated for each waste material type represents a composite of state and local industry statistics for waste stream composition.

Trends observed since the waste stream composition reported in Marion County SWMP in 1995 include the following (for details see Parametrix 1995 and Chapter 6 of this document):

- Waste generated in Marion County increased by approximately 45 percent from 1993 to 2000 (from 244,759 tons in 1993 to 355,375 tons in 2000).
- Waste recycled in Marion County increased by approximately 113 percent from 1993 to 2000 (from 62,541 tons in 1993 to 133,277 tons in 2000).
- The recycling rate increased to 38 percent in 2000 before credits, up from 27 percent in 1993. Considering the credits assigned to waste reduction efforts, the recovery rate (waste reduction and recycling) for Marion County is 44 percent.

Table 2-5 provides a summary of generated and disposed wastes over a four-year period between 1997 and 2000 for Marion County, based on the most comprehensive data available.

**Table 2-4
Marion County waste stream for 2000***

Material Generated	% of Total Waste¹	Waste Generated (tons)	Waste Disposed (tons)	% Disposed	Waste Recycled (tons)⁴	% Recycled
TOTAL PAPER	31%	110,166	68,342	62%	41,825	38%
Cardboard/Brown Bags	9%	31,984	8,812	28%	23,172	72%
Mixed Paper / Materials	13%	46,412	43,187	93%	3,225	7%
Newspaper	3%	10,661	448	4%	10,214	96%
Magazines	2%	7,108	6,013	85%	1,095	15%
Hi Grade Paper	4%	14,215	10,096	71%	4,119	29%
TOTAL PLASTICS	7%	25,587	20,805	81%	4,782	19%
ORGANICS	41%	145,704	91,235	63%	54,469	37%
Yard Debris	11%	37,314	9,353	25%	27,961	75%
Wood	13%	45,843	22,197	48%	23,647	52%
Food	7%	23,455	22,734	97%	721	3%
Other Organics*	10%	34,969	32,829	94%	2,140	6%
GLASS	3%	9,951	3,018	30%	6,933	70%
METALS	8%	29,141	9,768	34%	19,373	66%
Aluminum	1%	3,554	1,114	31%	2,440	69%
Tin Cans/aluminum	1%	1,777	194	11%	1,582	89%
Other (scrap metal)	6%	19,546	4,195	21%	15,350	79%
OTHER INORGANICS	8%	29,496	26,631	90%	2,866	10%
Rock / Concrete / Brick	6%	21,323	18,778	88%	2,545	12%
Gypsum wallboard	1%	3,554	3,353	94%	201	6%
Electronics	1%	3,554	3,434	97%	120	3%
OTHER MATERIALS	1%	3,554	523	15%	3,031	85%
Motor Oil	1%	3,483	542	16%	2,940	84%
Batteries	0%	267	184	69%	83	31%
Other	0%	89	81	91%	8	9%
TOTAL WASTE	100%	355,375²	222,098³	62%	133,277	38%

* Includes textiles, rubber products, furniture, animal waste, used carpet, and other material (tires not included).

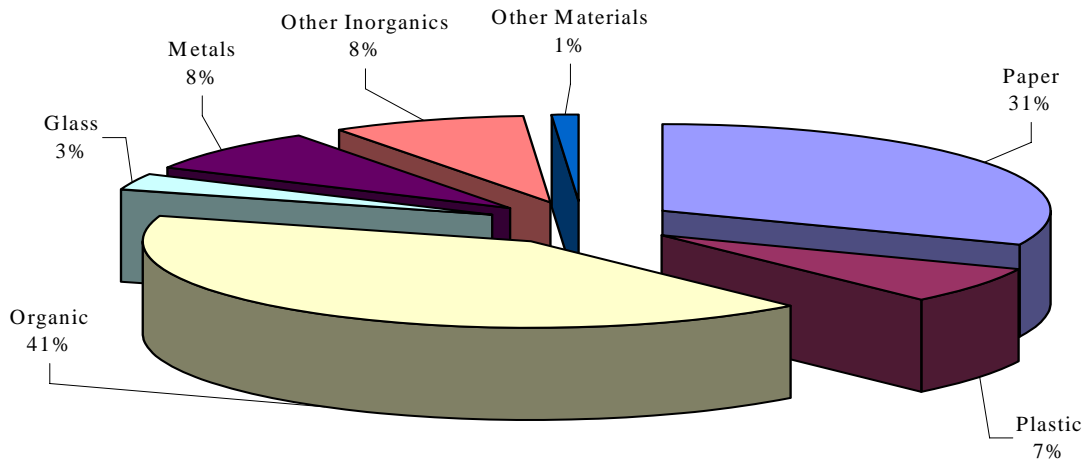
¹ Based on ODEQ 1998 (Composition Report, Marion County Supplement) and SCS Engineers 1987 (Waste Stream Characterization Study).

² Calculated as sum of total waste disposed and total waste recycled.

³ Total waste disposed value for 2000 calculated in Table 2-3.

⁴ Waste recycled by type as reported by ODEQ 2001b (Marion County Wasteshed Recovery Comparison 1999 to 2000). Tires are excluded.

**Figure 2-2
Composition of Solid Waste Generated in Marion County in 2000**



Source: See % of Total Waste column in Table 2-4.

**Table 2-5
Summary of historic waste stream data for Marion County
between 1997 and 2000 (in tons)**

TOTAL WASTE	1993¹	1997	1998	1999	2000
Waste Generated	244,759	317,592 ²	337,099 ³	342,828 ³	355,375 ³
Waste Disposed/ Incinerated	182,218	228,192 ²	233,800 ⁴	234,740 ⁴	222,098 ⁴
Waste Recycled	62,541	89,400 ²	103,299 ⁵	108,088 ⁵	133,277 ⁵
Recycling Rate¹	26%	28%	31% ⁶	32%	38%

¹ Parametrix 1995.

² As reported by ODEQ 2001a (2000 Material Recovery Survey Report).

³ Calculated as sum of waste disposed and waste recycled.

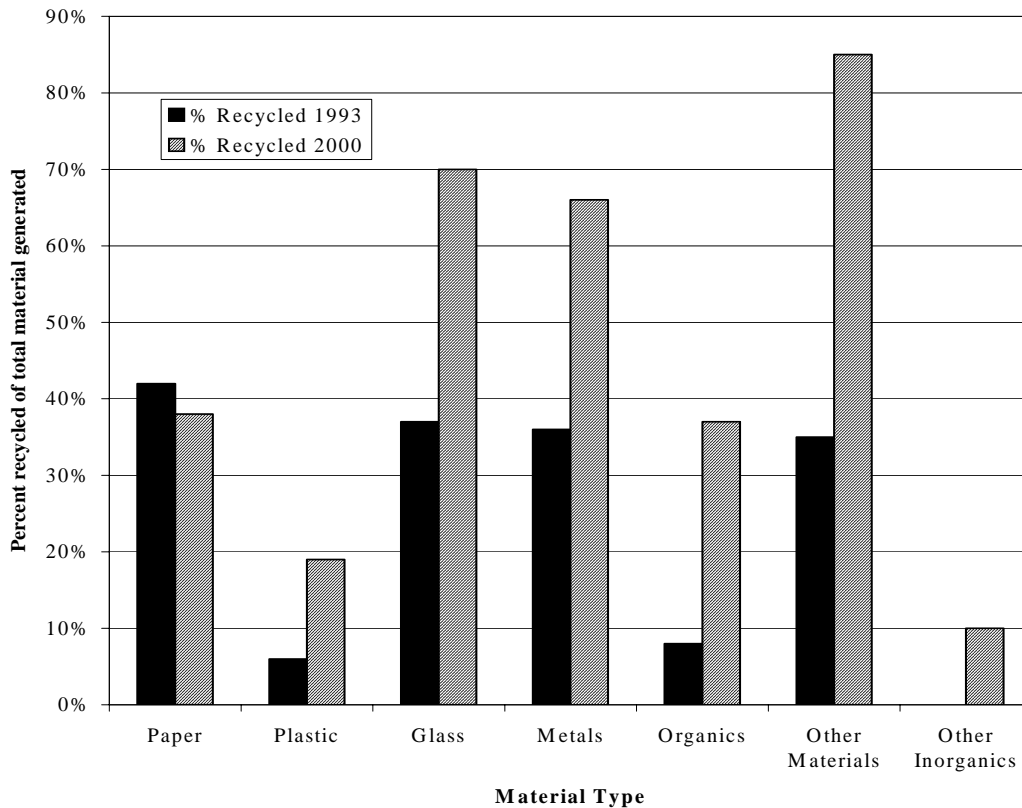
⁴ See table 2-3.

⁵ As reported by ODEQ 2001a (2000 Material Recovery Survey Data), less the weight of tires recycled (considered to be equivalent to weight of tires generated).

⁶ Calculated recycling rate (31 percent) differs from ODEQ reported recycling rate (30 percent) due to rounding errors and slight differences in calculating waste disposed and recycled (e.g., subtraction of tires).

A comparison of the recycling rates by material type for the County in 1993 and 2000 is provided in Figure 2-3. On average the recycling rates by material type increase over time. However, there is an exception with respect to paper. The decline in the recycling rate for paper can be attributed in part to the change in the way that the amount of paper recycled is estimated by ODEQ. Recyclable materials can be prepared for curbside collection in different ways. In source-separated recycling, residents place materials into different containers based on the type of recyclable; in commingled collection, all materials are mixed into one container. Recyclables collected in Marion County were source-separated in 1993 (Parametrix 1995). Today, a significant proportion of recycling is collected in commingled waste streams, and the recycling facilities have to estimate the proportion of the recycling materials that can be attributed to specific materials like cardboard. In the future, magazines and newspapers will be combined. The decline in paper recycling may also be attributed to the economic decline during this period and its effect on the profitability of paper recycling. The graph (Figure 2-3) demonstrates an extreme increase in the recycling rate of other materials since the rates reported in the 1995 SWMP. The "Other Materials" category for 1993 and 2000 cannot be directly compared, because in 1993 "Other Inorganics" was not tracked as a separate category from the "Other Materials" category as it was in 2000.

**Figure 2-3
Comparison of recycling rates for 1993 and 2000**



Source: 1993 data is reported in Parametrix 1995. See Table 2-4 for sources of 2000 data.

2.4.4 Waste Stream Generation Forecast

Estimates of future waste generation levels, which are used in solid waste planning, can be calculated by multiplying forecasted population numbers by per capita waste generation. Population forecasts developed by the Oregon Office of Economic Analysis (OEA) assume average annual rates of increase of 1.3 percent to 1.5 percent in Marion County (OEA 1997). U.S. Census figures indicate that population in Marion County actually increased by 2.23 percent annually between 1990 and 2000 (Population Research Center. 2001). Table 2-6 displays historical and projected population; projected population is shown as a range with the OEA figures at the low end and calculated figures (2.23 percent annual increase over 2000 population figures) at the high (conservative) end of the range. Because larger populations will result in higher calculations for total waste generated, using a higher population growth estimate is more conservative from a planning perspective. For this reason, waste stream projections in Table 2-7 were calculated based on an estimated annual population growth rate of 2.23 percent throughout the period of consideration, rather than using the OEA figures. Waste stream generation forecasts are covered in greater detail in Chapter 6 (see Tables 6-1 through 6-4).

**Table 2-6
Historical and projected Marion County population data**

Year	OEA Population Projections¹	Average Annual Rate of Increase	Projection based on U.S. Census Population²	Average Annual Rate of Increase
2000	284,834		284,834	
2005	308,364	1.6%	318,041	2.23%
2010	331,025	1.5%	355,120	2.23%
2015	354,561	1.4%	396,522	2.23%
2020	378,208	1.3%	442,750	2.23%

¹Population projections from OEA 1997 for Marion County

²Annual rate of increase was calculated using population increases from 1990 to 2000

Per capita waste generation rate was 2,495 pounds per person in Marion County in 2000 (see Table 2-5). Table 2-7 shows the predicted waste generation quantities for 2000 through 2020, which were calculated by multiplying the per capita generation rate by the more conservative population estimates from Table 2-6.

Table 2-7
Marion County waste stream projections

Year	Population¹	Waste Generation (tons)²
2000	284,834	355,375
2005	318,041	396,756
2010	355,120	443,012
2015	396,522	494,661
2020	442,750	552,331

¹ See data presented in Table 2-6. Conservative (higher) population projections were used.

² Based on a per capita waste generation rate of 2,495 lb/year. See Tables 2-4 and 2-5 for waste generated in 2000.

1.5 Plan Organization

This introductory chapter has provided information on the purpose of the Updated Plan and guiding principles for managing solid waste in Marion County. Chapter 2, Background and Waste Stream Analysis, describes the current system and the types and quantities of solid waste generated in the County.

The remaining chapters address each component of the solid waste system, including:

- Waste Prevention/Reduction/Recycling Analysis
- Recycling and Materials Processing
- Collection and Transfer
- WTEF and Landfill Disposal (Ash and MSW)
- Administration and Enforcement

As each component is reviewed, the Chapter covers the following relative to that component:

- Review of current practices
- Needs and opportunities
- Discussion and evaluation of alternatives
- Recommendations for future actions

Refer to the Executive Summary for an overview of the 2002 SWMP Update, a summary of the recommendations, and the schedule for implementing those recommendations.

EXECUTIVE SUMMARY

Solid Waste Management Plan - 2002

INTRODUCTION

Marion County, working cooperatively with local jurisdictions, the private sector and the public, has been able to achieve an effective and efficient integrated solid waste management system. The system includes many programs and services aimed principally at preventing and reducing waste generation and recycling materials. It also includes facilities such as recycling centers, transfer stations, the Waste to Energy Facility (WTEF), and landfills needed to properly handle solid waste.

In August 2001, the County decided to review and update the 1995 Solid Waste Management Plan. The plan development, managed by the Public Works - Environmental Services (PWES) (formerly Department of Solid Waste Management), was a cooperative effort with stakeholders (service providers, cities and other private companies). An independent consultant, Drennen Consulting Services /URS Corporation was used to review the current management system, evaluate alternatives and present recommendations. The Solid Waste Management Advisory Council (SWMAC) participated in the development of the plan and provided a forum for dialogue and comment on the SWMP to ensure that public input helped shape the direction and priorities.

The result of this effort is the 2002 Solid Waste Management Plan. It represents a comprehensive assessment of the current system and recommends programs and strategies for managing solid waste for the next 10 years.

Progress Since Implementation of 1995 Solid Waste Management Plan

Since its adoption, the 1995 SWMP has been used to plan and implement programs and facilities to maintain a cost-effective and environmentally sound solid waste system. Between 1995 and 2000, Marion County's recycling rate has increased from 29 percent to 38 percent (ODEQ 2001) while the total recovery rate increased to 44%. A key component of the system since 1995 has been the expansion of waste reduction education and promotion programs and a focused plan to increase recycling services. This included the startup and operation of facilities to process yard debris and wood waste into compost and other organic products.

The franchised collection companies have continued to make investments to enhance and expand collection programs. These collection companies entered into a cooperative agreement to expand the Marion Resource Recovery Facility (MRRF). At this facility, commercial waste can now be processed and certain materials can be recovered. Also, the Waste-to-Energy Facility (WTEF) has installed new equipment in order to keep pace with air quality standards while maintaining an excellent service record.

Most important is that citizens and businesses of Marion County have responded favorably to these new programs and services by participating in waste reduction and recycling of more materials.

Purpose of Updated Plan

Despite the large gains in reducing waste and recycling more materials, the population and economic growth in Marion County has resulted in more waste being handled by the system. Projections indicate that the waste stream will continue to grow. In addition, new recycling goals have been established by the State thus creating the need to examine other options for reducing waste and recycling more materials.

Considering these issues and the fact that several factors have changed since its adoption, the County committed to updating the 1995 SWMP. Specifically, the update will accomplish the following:

- Review the progress to date and verify if assumptions made in 1995 are still valid;
- Consider impacts from changes in regulations, technology and market conditions;
- Determine if and when new or expanded facilities will be required; and,
- Update administrative and management practices to ensure financial stability.

The 2002 SWMP evaluates the future operation of the solid waste management system and identifies needs and opportunities for the next 10 years. The Plan can be used as a tool for decision-makers to determine the need for future facilities and programs that should be implemented to continue the success of the solid waste management system.

Plan Objectives and Goals

The guiding principle in Marion County's solid waste management planning is that solid waste should be viewed and managed as a resource. The County strives to conserve resources through behavioral changes and recognizes the integral link between solid waste management, the environment, and ultimately the quality of life. This 2002 SWMP presents a comprehensive long-term approach to solid waste management in the County, designed around this resource conservation and management principle. Updating the SWMP provides citizens and decision-makers in the County with a mechanism to implement, monitor and evaluate solid waste facilities and programs in the future. Recommendations developed for the 2002 SWMP not only guide local decision-makers, but substantiate the need for local funds and state grants for local solid waste projects and new programs.

The County's primary objective is to provide:

“Guidance for continued development and implementation of an integrated solid waste management system that has been developed through a cooperative effort of local governments, citizens and industry. The SWMP should achieve development of a system which is environmentally sound, technologically

feasible, cost-effective, locally controlled and publicly acceptable; and provides for an overall reduction in long-term per capita waste generation and toxicity.”

Achieving this objective requires that the Plan attain a balance between cost-effectiveness and environmental responsibility, as well as being technologically feasible and accepted by the public. To ensure that this mission is met, the Solid Waste Management Advisory Council and public participants developed specific objectives that the solid waste system should strive to attain. These specific objectives are:

1. To provide an integrated solid waste management system that achieves an effective combination of strategies and programs guided by the principles adopted in the state hierarchy to reduce waste at the source, reuse and recycle materials, compost, recover energy and land disposal.
2. To continue educating consumers in order to promote practices and methods to reduce the long-term per capita waste generation.
3. To develop programs and support implementation of facilities that seek to ensure materials recovered from the waste stream attain the highest and best use and are recycled.
4. To develop a solid waste system that is based on sound financial principles, provides cost effective services and maintains rates stability over a long term, while allocating cost equitably to all users.
5. To maintain system flexibility to respond to changes in waste stream composition, waste management technologies, public preferences, new laws and changing circumstances.
6. To provide services that meets the diverse needs of businesses and residences in urban and rural communities and that is both effective and fair to all users.
7. To maintain a cooperative approach between the cities, county and other local governments by providing opportunities for regional networking to ensure successful implementation of the SWMP.
8. To ensure ongoing public input opportunities through the development and implementation of this Plan.

Marion County’s primary objective, as stated above, is to protect the environment by emphasizing waste reduction. To achieve this, the County must establish a target waste recovery rate and reach or exceed that level by the year 2009. The statewide goal established by ODEQ sets Marion County’s recovery rate at 54 percent for 2009 (ORS 459A.010). This target will be measured on an annual basis, and programs and facility assessments will be made on the County’s progress towards reaching this state goal.

In addition to the state recovery rate goal, other goals identified by the County and endorsed by SWMAC that apply to the current solid waste system in Marion County include the following:

- Achieve cost-effective diversion by maintaining long-term disposal capacity and avoiding significant, additional capital investments for new disposal facilities.
- Maintain the role of the WTEF in the County, “region” and state. (The WTEF currently provides processing and energy recovery for waste from Marion County and certain other counties and regions of the state.)
- Develop a long-term management strategy to facilitate cost-effective utilization of the WTEF. (The WTEF has reached capacity; therefore, other disposal options must be explored.)
- Generate and evaluate alternatives to further enhance the County’s current 44 percent recovery rate (including but not limited to an evaluation of enhanced curbside collection).

This 2002 SWMP is designed to provide guidance on solid waste management issues over a 10-year planning period (2002-2012). However, it should be recognized that solid waste practices, regulations, and technologies are extremely dynamic in nature and will result in a need to update and revise the SWMP on a regular basis in the future.

Key Issues for the Updated SWMP

Several issues have emerged that pertain to managing solid waste consistent with the values and principles established in the 1995 SWMP. The 2002 SWMP addresses these issues, evaluates alternatives, and recommends a course of action to respond to these needs. Some of the key issues include the following:

1. With the State adopting new recovery goals, what are the next steps toward reducing waste and decreasing the dependency on landfill disposal?

Marion County and service providers have implemented a full range of programs aimed at preventing and reducing the amount of waste generated, and has developed certain facilities to process and recycle materials. The 2002 SWMP must focus on ways to enhance existing programs and facilities to recover more materials. Also, a careful review of the waste stream is warranted to enable the County to apply resources wisely to increase the amount of waste reduction and recycling.

2. What changes are needed in the solid waste system to deal with the transition from collecting source-separated materials to one that collects commingled materials at the curbside?

Service providers are beginning to implement a change in the system using semi or fully automated collection vehicles. This system allows more efficient collection and will allow households to place several types of recyclable materials into one or two containers. In other areas where these systems operate, participation in curbside recycling programs has increased, as have the quantities of materials recovered for recycling. As new collection systems are implemented, education and promotion programs will need to be modified, and new facilities to process and handle commingled materials may be required.

3. *Growth in the County resulted in the disposal of 51,000 tons of MSW in landfills in 2000, an increase of over 100 percent since 1993. What will be the long-term strategy for managing this waste stream?*

In 1993, (the base year used in the 1995 SWMP) the majority of municipal solid waste (MSW) was disposed of at the WTEF. That same year the County disposed of less than 5,000 tons of solid waste in both in-county and out-of-county landfills. This waste was in excess of the capacity of the WTEF. Since 1993, the amount of MSW in excess of the WTEF has grown due to growth in the county, such that in 2000, ODEQ reported over 36,000 tons of MSW from Marion County going to landfills. In addition, the County disposed of over 15,000 tons of demolition waste at the Brown's Island Landfill that same year.

4. *What actions should the County take to maintain rate stability and ensure that potential environmental liabilities are adequately funded?*

This issue is related to the increasing amount of MSW that is disposed outside of the County. Individuals electing to haul waste outside of the County avoid paying certain fees aimed at funding countywide programs for waste reduction and recycling. The result is that users of the County system subsidizing certain services for those individuals who choose to haul their waste out of the County. They also avoid paying their fair share of debt service for existing facilities, environmental controls for closed landfills and any other fixed system cost. A strategy whereby all users pay fairly for these programs and services needs to be developed.

These represent some of the issues and concerns addressed in the 2002 SWMP. However, each Chapter of the Plan discusses the needs and opportunities pertaining to that aspect of the solid waste system. As each aspect of the solid waste system is reviewed and updated, issues related to meeting the goals of the SWMP are addressed.

Key Plan Recommendations/Highlights

To address the primary issues identified, certain recommendations were made to set forth action to meet the County's needs. These recommendations should be viewed as priorities, or key decisions in the immediate future. In some cases, the County and private haulers and recyclers have already begun to take action, particularly in the areas of recycling. In addition to these priority actions, a full list of the recommendations, as well as an implementation schedule, is provided in the Executive Summary.

The key recommendations are as follows:

- Focus on a smooth transition from source separated to commingled recycling
- Continue to expand multifamily and commercial recycling programs
- Although facilities and system are already in place, as the waste stream continues to grow, the County should continue strategic planning and prepare evaluations of alternatives for future disposal, including the WTEF, landfills, etc.

These represent a few of the key recommendations addressed in the Updated Plan. A full list of the plan recommendations is provided in the following section.

RECOMMENDATIONS

Recommendations summarized in this section were developed based on the public input and review process, which established certain goals for making decisions. The solid waste management needs in Marion County were assessed, and alternatives were developed and compared to these goals for each element of the solid waste system. Recommendations were formulated based on this analysis and presented to the PWES and the SWMAC for review and adoption.

Presented in the remaining pages of this section are the recommendations developed as a result of the solid waste management planning process. For more information on recommendations in specific topic areas (e.g. waste reduction, recycling, processing, disposal) see the appropriate chapter.

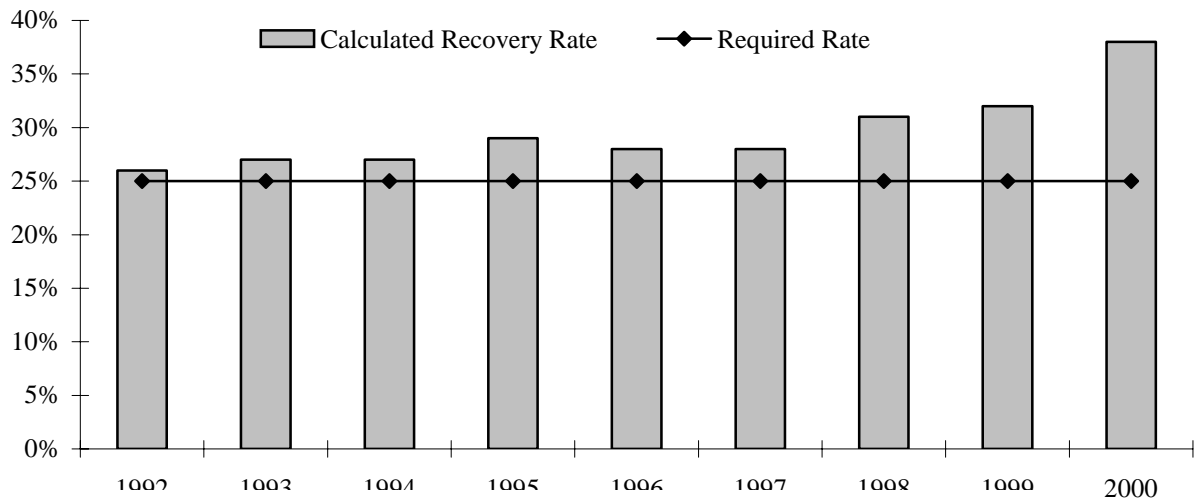
Waste Prevention, Reduction, and Recycling

Marion County's Department of Solid Waste Management has implemented a multifaceted, comprehensive recycling and waste reduction program, which satisfies the requirements of the 1991 Recycling Act (Senate Bill 66). Since the inception of PWES's program, the amount of waste recycled has grown steadily (Figure ES-1). The recycling rate grew to 38 percent in 2000, exceeding Marion County's ODEQ mandate of 25 percent by 1996.

Marion County has the infrastructure in place to address all of the major components of a comprehensive recycling program. Future increases to the County's recycling rate will be a result of expansions or enhancements to existing programs. There are several areas that should be targeted to meet the State's recycling goal of 54 percent by 2009. They are as follows:

Recommendation 3.1: The County should continue to budget funds and allocate resources needed to execute current promotion /education programs and to support existing services.

**Figure ES-1
Marion County Recycling Rate, 1992 – 2000**



Source: Oregon Department of Environmental Quality. 2001a.

Recommendation 3.2: Marion County along with the cities, franchised haulers, and other stakeholders should continue to develop and expand collection of commingled materials.

Recommendation 3.3: The County should investigate single-stream collection. A pilot program to evaluate the feasibility of single-stream collection could be considered in the future.

Recommendation 3.4: Marion County should establish a task force to evaluate alternative approaches for developing a multi-family collection program. The task force should include representatives of various cities and local haulers, who would consider changes in the franchise agreements needed to implement these services. A pilot project should be implemented for the purposes of evaluating the most effective methods and for demonstrating the advantages of this program to other jurisdictions and to owners/ managers of multi-family properties.

Recommendation 3.5: The County, working with Mid Valley Garbage and Recycling Association, should develop a comprehensive approach for expanding commercial recycling programs. This approach could include establishment of pilot projects to collect commingled materials, providing rate incentives and targeting certain business sectors to collect high graded loads that could be sorted at the MRRF.

Recommendation 3.6: Yard and food waste makes up a large percentage of the municipal waste stream, by weight. Marion County should continue implementing its yard waste collection program and integrate, where feasible, the collection and processing of food waste.

Recommendation 3.7: Marion County should adopt a procedure, possibly including an ordinance, to encourage construction/demolition contractors to prepare a recycling program for projects of a certain size. The County should focus on incentive programs, but could also investigate mandatory requirements. Once the program is developed, the County could approach cities to enlist support for adopting similar ordinances.

Recycling and Materials Processing

Marion County is achieving the state recycling goal through the implementation of a number of programs. The County currently has adequate recycling collection and processing facilities to handle its needs. The collection and recycling technology is transforming from source separation to commingled programs, and the various operators have begun to implement a new system for processing and marketing materials. With a few modifications, these same facilities should be able to handle the expected growth Marion County should realize over the next 10 years. There are no immediate recommendations to implement changes in the process handling facilities. The recommendations below describe current practices that should be maintained in order to ensure continued efficiency in recyclable processing.

Recommendation 4.1: The County should continue to monitor the progress of the agreement between Mid-Valley, Garten, and Far West and work with these parties to make refinements needed to ensure recyclable materials are processed and marketed.

Recommendation 4.2: Continue to implement pilot programs (as described in Chapter 3) to develop methods for composting “green waste” and other food by products. Increased collections can help to supply material to Wood Waste Reclamation (WWR), which is capable of handling the current and the future projected volumes of yard and vegetative food or green waste processing.

Waste Collection and Transfer

Current collection and transfer practices in Marion County are adequate to meet waste management needs. The current franchise system meets the collection needs of the entire county and is expected to continue to do so in the future. Waste transfer demands are likely to increase as the waste stream grows, however, and existing transfer stations may need to be expanded. The need for waste transfer will be realized within the next 5 years.

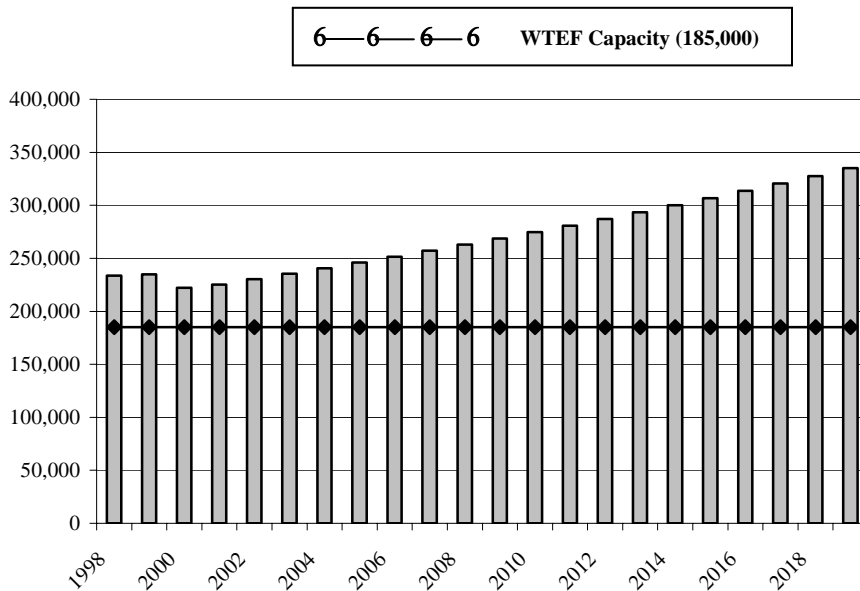
Recommendation 5.1: To manage growing waste streams in an efficient and cost-effective manner, the County should investigate the creation/expansion of waste transfer stations. The County should begin planning now for activities that will be required within the next 3 to 5

years in order to implement transfer stations into the waste management infrastructure as they are needed.

Waste-to-Energy and Solid Waste Disposal

Marion County's Solid Waste Management System is a mature system with successful waste prevention, reduction, and recycling programs. Even with such measures in place, however, the waste stream will grow due to population increases as shown on Figure ES-2. As a result, alternatives for disposing of waste must continue to be evaluated. The following recommendations address potential alternatives to managing future disposal needs.

Figure ES-2
Marion County Projected Waste Disposal Needs (tons), 1998 - 2019*



*Assumes future recycling rate remains constant at 38 percent. See Chapter 3 for assumptions and more information.

Recommendation 6.1: The County should develop a service agreement with local landfills to ensure adequate capacity of MSW for the next 10 years. The agreement should include provisions that Marion County will deliver or cause to deliver MSW in excess of the WTEF capacity for a certain timeframe. The County should request the local landfill collect appropriate fees from customers whose waste is generated in Marion County.

Recommendation 6.2: The County should continue to preserve a back up MSW landfill cell at NMCDF. This cell provides added insurance if the WTEF were not able to accept MSW for any significant period of time. Once the County has secured an agreement with a local landfill this cell could be converted for ash disposal.

Recommendation 6.3: The County should continue to consider all options for disposal of MSW in the long term. One possibility is to site a new landfill in the County. A bioreactor

landfill has some advantages over conventional landfills, and it may be appropriate for Marion County to consider this technology. This would require the County to identify and evaluate appropriate land use zones where solid waste facilities might be sited. Considering these locations the County would modify the Comprehensive Land Use Plan to ensure solid waste facilities could be permitted in these zones.

Recommendation 6.4: The County should prepare an evaluation of long term disposal options considering the impacts of continued operation of the WTEF and disposal at local and regional landfills by the year 2009.

Recommendation 6.5: The County, in cooperation with Covanta, should pursue options to reuse ash residue generated from the WTEF. Several states are moving forward with programs to examine beneficial uses for this material.

Administration and Enforcement

The management of solid waste has changed throughout the last 20 years. It has evolved from a primary emphasis on collection and disposal to a complex series of operations based on a specific environmental hierarchy. These changes require an increased focus on the administration of a growing program that includes waste reduction, reuse programs, recycling, waste-to-energy and disposal facilities. The following recommendations address strategies to ensure that system charges remain stable.

Recommendation 7.1: The County should complete an in depth evaluation of the funding options to be considered for ensuring that all users of the system are paying the cost of basic programs.

Recommendation 7.2: The County should continue to operate solid waste as an enterprise fund and maintain a policy of internal financing. The system should continue to rely on system users paying directly for services and for the enterprise fund to limit future debt.

IMPLEMENTATION SCHEUDULE

A ten-year (2002 – 2011) implementation schedule, or timeline, for the recommendations described in this document is provided below. Some of the timing for implementing the recommendations may need to be modified as circumstances change or issues arise. The following schedule is intended to serve as a general guideline for the implementation of the above recommendations, rather than a strict timeline.