Solid Waste In Washington State

Fifteenth Annual Status Report

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Solid Waste and Financial Assistance Program
December 2006
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Prepared by:

Washington State Department of Ecology
Solid Waste and Financial Assistance Program

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Ellen Caywood
Environmental Planner
Solid Waste & Financial Assistance Program

Chapter I
Issues Facing Solid Waste

Product Stewardship[1]

Product stewardship efforts aim to encourage manufacturers to take increasing responsibility to reduce the entire life-cycle impacts of a product and its packaging – energy and materials consumption, air and water emissions, the amount of toxics in the product, worker safety, and waste disposal – in product design and in the end-of-life management of the products they produce.

The concept of product stewardship is based on the following principles, developed by the Product Stewardship Institute:

1. Everyone associated with a product has a responsibility for the product throughout its lifecycle. This responsibility is greatest for those that have the greatest ability to reduce and eliminate the environmental and health impacts of the products.
2. All costs associated with products should be part of the product retail price – from using resources, to reducing health and environmental impacts throughout the production process, to managing products at the end-of-life. Government subsidies of these activities should be eliminated. This should provide manufacturers a direct financial incentive to redesign their products to reduce these costs.
3. Policies that promote and implement product stewardship principles should create incentives for the manufacturer to design and produce "cleaner" products – ones made using less energy, materials, and toxics, and which result in less waste (through reduction, reuse, recycling, and composting) and use less energy to operate.
4. Those that are responsible for reducing the health and environmental impacts of products should have flexibility in determining how to most effectively address those impacts.
5. Industry should provide leadership in realizing these principles. Government can support product stewardship through procurement, technical assistance, program evaluation, education, market development, agency coordination, and by addressing regulatory barriers and, where necessary, providing regulatory incentives and disincentives. Together, industry and government should inform consumers about these principles.

Ecology has been involved with the Product Stewardship Institute since the institute began in 1999.

[1] Product Stewardship Institute, Product Stewardship Principles, can be reviewed in there entirety at: http://www.productstewardship.us/displayPage.php?pageid=100

Product Stewardship of Electronics

Background

One of the first products that the Product Stewardship Institute worked on was consumer electronic products. In 2000, the National Electronic Product Stewardship Initiative (NEPSI) was started. This initiative was facilitated by the University of Tennessee, funded by a grant from the U. S. Environmental Protection Agency.

NEPSI brought together representatives from state and local governments, electronic product manufacturers, environmental organizations, academia, and the recycling industry. The hope was to develop a consensus product stewardship strategy for computers and televisions.

Several meetings were held, negotiations took place, and compromises were brokered. Overall, there was general agreement that product stewardship for these products was desirable. However, the methods of going about it, particularly related to funding, found no single solution upon which everyone could agree.

The funding approaches most being considered were:

- "Advanced Recovery Fee" (ARF).
- Manufacturer "Partial Cost Internalization" (PCI).

The ARF is a fee placed on consumer products when purchased by consumers, collected by retailers, and then paid to government. Government would then fund collection programs for the taxed products at end of life.

Cost internalizations, or in this case partial cost internalization (PCI), requires manufacturers to incorporate the cost of end of life management, and other related environmental impact costs into manufacturers' cost of doing business. "Partial" was used because not all costs would be covered through this alternative.

The government contingent supported a hybrid model with both ARF and PCI. The ARF would be initiated first and used to collect and return current stocks of products for which cost internalization had not been originally considered when the products were manufactured and purchased ("historic and orphan" products). A PCI would come into play at a later date, at which time the ARF would be eliminated. The PCI would fund industry costs for recycling computers. The problem is who pays for ongoing collection and how do you pay for it? Some industry representatives supported the hybrid model, some manufacturers preferred the ARF, while others preferred partial or full cost internalization. The NGO contingent preferred application of both ARF and PCI as soon as possible.

Also in contention was how much of the full costs of recycling, from collection, to transport, to consolidation, to processing, will be paid for by any model.

NEPSI members continued to meet to try and work out differences until February 2003. At that time NEPSI members met in Portland, Oregon. The remaining issue was funding. Industry could not agree on a funding approach. It was agreed that industry would come back

to the NEPSI group by April of that year with an agreement that all of their members could live with. By September, with no further progress made on the funding issue, NEPSI was declared concluded.

State Legislation

Needless to say, frustrated by delays in resolution of the financing mechanism, state and local government stakeholders began talking about legislation at the state level. Many states, including Washington, have considered electronic product recycling laws. The 2004, the Washington State Legislature passed a bill that directed Ecology to study and recommend a statewide program for recycling of electronic products and how to finance that program. In asking Ecology to make recommendations to create a reuse and recycling system for electronic products, the legislature directed us to work with the same stakeholders represented in the NEPSI process to come up with these recommendations.

To date, four states have passed electronic product recycling laws; California, Maine, Maryland, and Washington. Washington's is the most comprehensive and requires the least amount of government involvement. The Council of State Governments recently adopted a resolution supporting electronic product stewardship legislation that is very similar to that of the new Washington law.

Ecology carried out that study, providing the legislature with an interim report in December 2004, and final recommendations in December 2005. All the information related to the study, along with the resulting reports can be found at: http://www.ecy.wa.gov/programs/swfa/eproductrecycle/ .

Ecology knew that consensus probably would not be possible, though every effort was made to gain consensus. The final report submitted to the legislature did not have full support of all industry representatives. It did, however, have the support of some manufacturers, local governments, environmental groups and retailers.

Ecology recommended cost internalization as the method to financing electronics recycling. Ecology also provided the framework for legislation that delineated the program that should be developed and provided it to the legislature as its final report.

The recommendations where accepted by the legislature. A bill was introduced that had the support of most of the members of Ecology's advisory panel and reflected most of the recommendations Ecology put forth.

Washington's New Electronic Product Recycling Law

The bill was passed by the 2006 state legislature in March.[2] The law, *chapter 70.95N RCW, Electronic Product Recycling*, requires that manufacturers of televisions, computer monitors, computers and portable and laptop computers provide collection, transportation and processing services for those products throughout the state. Manufacturers are to finance these services. All manufacturers must participate cooperatively in a standard plan to provide

[2] http://apps.leg.wa.gov/RCW/default.aspx?cite=70.95N&full=true

those services. Under certain circumstances, manufacturers can opt out of the standard program and provide their own independent program. Plans describing these programs are to be submitted to Ecology for approval. The standard plan and any independent plans are due for review by Ecology no later than February 1, 2008. The plans must be implemented by January 1, 2009.

Manufacturers must register with Ecology and pay their administrative fee by January 1, 2007. All covered products sold in the state must be labeled with the manufacturer brand name by that date as well. No covered electronic product can be sold in the state if they are not labeled or if the manufacturer has not registered and paid their fee. There are significant financial penalties for non-compliance.

Ecology began writing rules in April 2006. The first set of rules delineating requirements for manufacturer registration, Ecology administrative fees, product labeling and collector and transporter registration was adopted on November 7 (http://www.ecy.wa.gov/laws-rules/erecycling/x0607a.pdf). Registration forms and fee billings were sent out to 163 manufacturers on November 15, 2006.

Additional rules are being developed. These rules cover issues such as processor performance standards, plan content, and collection standards. They will be published for public review and comment in April 2007, with an anticipated adoption sometime in August 2007. The rule development process is documented on this website: http://www.ecy.wa.gov/programs/swfa/eproductrecycle/rulDev.html

Chapter II
Partnering for the Environment

Ecology's Solid Waste and Financial Assistance Program (SW&FAP) emphasizes partnerships in all aspects of solid waste management. Partners in business, local government, community organizations, state government, agriculture, education, and industry are working together. They bring their diverse expertise, creative ideas, and resources tackling challenging issues and working toward important goals, including a more sustainable future for us all.

Beyond Waste Encourages Partnerships

The past year has been an exciting time of transition in solid waste. We are carrying out priority actions in the *Beyond Waste Plan*, the state solid and hazardous waste plan completed in November 2004. Moving *beyond waste* involves a fundamental shift from managing wastes at the end of the pipe, to preventing them in the first place, wherever possible. Recognizing many wastes will continue to be generated, the *Beyond Waste Plan* also calls for valuing these materials as resources, moving them into closed-loop recycling systems instead of disposing of them.

> **The Beyond Waste Vision:**
>
> *We can transition to a society where waste is viewed as inefficient, and where most wastes and toxic substances have been eliminated. This will contribute to economic, social and environmental vitality.*

The *Beyond Waste Plan*[3] is both visionary and practical. It lays out an aggressive set of actions to be taken in the short-term to make progress toward the long-term vision for our state. It includes seven categories of actions, containing a total of 64 recommendations.

Many people and organizations have come together to launch several of the *Beyond Waste* activities. More projects are planned and will be started next year. Highlights of the *Beyond Waste* activities are listed below. Other "partnering projects" are discussed in this chapter.

Managing solid waste in Washington benefits from exciting partnerships in many areas:

- Financial assistance.
- Green building.

[3] More information about *Beyond Waste* is available at www.ecy.wa.gov/beyondwaste/.

- Recycling and beneficial use of organic materials.
- Reducing threats from small-volume hazardous wastes and products.
- Environmentally preferable purchasing.
- Measuring performance.
- Cleaning up tires.
- Local solid waste and hazardous waste plans.
- Outreach, assistance and information sharing.

Partnering for the Environment through Financial Assistance

Coordinated Prevention Grants (CPG)

Purpose

Coordinated Prevention Grants (CPG) are funded by the Local Toxics Control Account (LTCA).[4] The CPG program is administered by Ecology through WAC 173-312, following the intent of the *Model Toxics Control Act (chapter 70.105D RCW)* to:

- Fund local government projects that greatly reduce contamination of the environment.
- Provide funding assistance to local governments for local solid and hazardous waste planning and for carrying out some projects in those plans.
- Encourage local responsibility for solid and hazardous waste management and improve grant administration.
- Promote regional solutions and cooperation between governments.

The LTCA revenue is from the Hazardous Substance Tax (HST), a tax on the first possession of hazardous substances in the state. Projected revenues to LTCA available each biennium for CPG are divided into two portions: 80 percent for Solid and Hazardous Waste Planning and Implementation grants and 20 percent for Solid Waste Enforcement grants.

Eligibility

Eligible applicants for CPG grants include:

- Local planning authorities.
- Agencies designated as lead implementation agencies for Local Comprehensive Solid Waste Management Plans.
- Jurisdictional health departments (JHDs).

[4] Authorized by RCW 82.21.030 (Chapter 82.21 RCW, *Hazardous substance tax -- Model toxics control act).*

Ecology allocates the available funds on a county-by-county basis, using a base amount for each county plus a per capita amount. Cities that are independent planning authorities and cities that coordinate with counties may receive funding up to the per capita allocation for their city. The availability and amount of funding depends upon legislative appropriations to the LTCA.

Awards

The Coordinated Prevention Grant program awards funds in two cycles, regular and off-set:

- **Regular Cycle:** Ecology allocates regular cycle funds based on the 80 percent allocation for Solid and Hazardous Waste Planning and Implementation grants and 20 percent for Solid Waste Enforcement grants. CPG funds are distributed to recipients requesting their full or partial allocation in the regular cycle.
- **Off-Set Cycle:** Funds for the off-set cycle come from funds that no one requests in the regular cycle ("unrequested" funds) and from funds that no one spent during the regular cycle ("unspent" funds). Ecology awards off-set cycle funds through a competitive process.

For the 2004-05 grant cycle (January 2004 - December 2005), Ecology awarded 121 grants to Washington counties, cities, and JHDs totaling $18,045,001. The grant funds were distributed as follows:

	Regular Cycle	**Off-set Cycle**
Waste Reduction/Recycling	$ 6,528,984	$ 513,257
Solid Waste Enforcement	$ 2,796,728	
Moderate Risk Waste	$ 7,583,601	$ 622,431
LTCA Funds distributed	**$16,909,313**	**$1,135,688**
Total LTCA Funds	**$18,045,001**	

For the 2006-07 grant cycle (January 2006 – December 2007), $10.2 million was initially appropriated plus an additional $4 million through a special legislative appropriation called the *Beyond Waste* Proviso. A supplemental appropriation for $8 million from the legislature brought the program back to regular cycle funding levels received in previous biennia.

Ecology awarded 113 grants to Washington counties, cities, and JHDs totaling $17,383,915 during the regular cycle and 81 grants totaling $4,800,000 during the off-set cycle. The grant funds were distributed as follows:

	Regular Cycle (1/1/06-12/31/07)	Off-set Cycle 1/1/07-12/31/08)
Organics	$ 1,174,114	$1,753,089
Green Building	$ 77,250	$ 92,750
Residential Waste Reduction/Recycling	$ 3,745,505	$ 568,183
Commercial Waste Reduction/Recycling	$ 976,361	$ 371,745
Solid Waste Enforcement	$ 2,994,429	$ 233,500
Moderate Risk Waste	$ 7,972,887	$1,576,733
Other	$ 443,369	$ 204,000
LTCA Funds	**$ 17,383,915**	**$ 4,800,000**
Total LTCA Funds	**$ 22,183,915**	

Future of the CPG Program

Solid waste generation continues to rise. Washington State's Solid Waste Management plan, *Beyond Waste*, identifies strategies to reduce waste and use waste as a resource. Funding for local governments is a key component in carrying out the Beyond Waste strategies.

For the next grant cycle (2008-09) beginning January 1, 2008, Ecology has requested $25.5 million dollars:

- $19.5 million for the regular cycle to help local governments carry out their solid and hazardous waste management plans, including recycling, household hazardous waste collection, and solid waste enforcement.
- $4.0 million to help local governments carry out parts of the state's *Beyond Waste Plan* focusing on waste prevention.
- $2.0 million in special funding to assist local communities that are impacted by the ban of outdoor burning imposed through *Washington's Clean Air Act (RCW 70.94.743*) like creating chipping, composting programs and other alternatives to burning yard and land-clearing waste.

Coordinated Prevention Grants Achieving Environmental Outcomes

The projects that are supported by the CPG program provide many benefits to Washington's citizens:

- Protecting human health by collecting about 12.8 million pounds of hazardous wastes from citizens and small businesses each year, preventing improper disposal and polluting Washington's ground and drinking water.

- Funding local JHDs for inspecting solid waste facilities and enforcing solid waste facility rules for 665 solid waste facilities. This includes 8,000 inspections and response to over 12,000 illegal dump and illegal storage complaints.
- Funding local recycling programs that now recycle or reuse 7.4 million tons of materials a year. These programs are critical to Washington's recycling rate
- Increasing energy and resource conservation through recycling, composting, and green building activities. Finding less toxic alternatives and other initiatives, decreasing air-borne toxins and carcinogens from energy production, and limiting greenhouse gas emissions.

Local Government Efforts Implementing Beyond Waste Vision Using CPG Funds

Today, the CPG program is refining the success of existing local projects and pioneering the next wave of waste prevention. Local governments are carrying out programs that support the *Beyond Waste* vision. A number of completed and current projects are highlighted later in this chapter under Green Building, Recycling of Organics, and Reducing Threats from Small-Volume Hazardous Wastes.

Grants to Citizens - Public Participation Grants (PPG)

Purpose

Washington's *chapter 170.105D RCW, Hazardous Waste Cleanup - Model Toxics Control Act,* provides for a Public Participation Grant (PPG) program. These grants make it easier for people (groups of three or more unrelated individuals or not-for-profit public interest organizations) to be involved in two types of waste grant issues:

- Cleaning up hazardous waste sites.
- Carrying out the state's solid and hazardous waste management priorities.

Public Participation Grant projects motivate people to change their behavior and take action improving the environment. These projects create awareness of the causes and the costs of pollution. They provide strategies and methods for solving environmental problems. This highly competitive program applies strict criteria to applications, awarding grants to projects that prevent pollution and produce measurable benefits to the environment.

Awards

The PPG program writes grants for either one year or two years. All Hazardous Substance Release Site grants are automatically written for the biennium (2 years). The Pollution Prevention Education/Technical Assistance grants may be written for one or two years. The most a grant recipient may receive for a one-year grant is $60,000; a two-year grant recipient may receive up to $120,000.

Since 1989, Ecology has given almost $6.5 million in Public Participation Grants to support the work of not-for-profit and community groups.

For the July 1, 2005, through June 30, 2007 grant period, Ecology awarded 31 Public Participation Grants totaling $1,211,541. These funds provided fourteen (14) grants for citizen involvement in the cleanup of hazardous waste sites and sixteen (16) grants for education and activities related to carrying out solid/hazardous waste pollution prevention education and management priorities.

Public Participation Grants Achieving Environmental Outcomes

Waste management priorities for the state identified in the 2004 *Beyond Waste Plan* are:

- Reducing the use of toxic substances.
- Decreasing waste generation.
- Increasing recycling.
- Properly managing any wastes that remain.

Several projects receiving grants during 2005-2007 are consistent with the goals of the *Beyond Waste Plan* and help create the partnerships needed to achieve the *Beyond Waste* vision in Washington State. A number of completed and current projects are highlighted in following sections of this chapter: Green Building; Recycling Organics; and Reducing Threats from Small-Volume Hazardous Wastes.

In addition, the following PPG-funded projects support other *Beyond Waste* recommendations and goals:

Beyond Waste Initiative: Current Solid Waste System Issues *– Projects related to strengthening the existing solid waste management system.*

- **Olympic Environmental Council**
  Involving the community in the cleanup of two landfills related to the Rayonier Mill cleanup site. (This is also listed under site cleanup grants for the Rayonier Mill site. The landfill component of the grant work is related to the *Beyond Waste* initiatives.)
- **The Columbia Gorge Ecology Institute**
  Promoting solid waste education, community sustainability and natural resource stewardship by using "The SECRETS" program in classrooms.
- **Methow Recycles**
  Expanding recycling participation with Methow Recycles by educating businesses and residents about their recycling options and offer new avenues for recycling.
- **South Sound Services**
  Reaching senior and disabled populations not currently reached waste reduction and recycling education efforts.

Other Sustainability Focused Pollution Prevention / Education Projects

- **Northwest Renewable Energy Festival**
  Establishing the Sustainability Resource Center providing free information, education and workshops. Holding an annual festival demonstrating emerging technologies to reduce waste and preserve resources.
- **Environmental Information Cooperative**
  Training educators in special stream pollution identification and pollution prevention. Bringing new information into classroom curriculum, expanding to 6 schools and 17 classes.
- **WA Childcare Resource & Referral Network**
  Providing outreach and education to childcare providers in the Safe Soil Program about the hazardous outfall materials from the Tacoma Smelter.
- **Far West Agribusiness Association**
  Increasing pesticide container recycling by educating commercial pesticide users.

Citizen Involvement in Hazardous Waste Site Cleanups

- **The Lands Council**
  Educating low-income families (Eastern European, Asian, and Tribal communities) and the general public about possible health risk factors associated with exposure to contaminants on beaches and fishing waters of the Spokane River.
- **Lake Roosevelt Forum**
  Providing meetings, workshops, conferences and tours for citizens around Lake Roosevelt, increasing their understanding of the remedial investigation and feasibility study being conducted by USEPA.
- **People for Puget Sound**
  Continuing education and encouraging involvement of the Duwamish River neighborhoods in the progress of the river's cleanup.
- **Olympic Environmental Council**
  Continuing educating Port Angeles residents about the Rayonier Mill cleanup process and two associated landfills, and encourages their involvement in voicing community values to be incorporated into the final cleanup decisions.
- **WA Physicians for Social Responsibility**
  Providing educational tools explaining the human/environmental history of Hanford and the challenging cleanup of radioactive waste. Encourages citizen participation in the Hanford cleanup decisions.
- **Citizens for a Healthy Bay**
  Protecting the post-Superfund health of Commencement Bay, surrounding waters and habitat through education, hands-on citizen and school involvement and by initiating sustainable practices.

- **Pacific Rivers Information Network (PRIN)**
  Providing information about the Hanford Tank cleanup activities with interested organizations and schools to encourage public interest and support. Will take a traveling road show to schools and develop new learning packages for school districts.
- **Brackett's Landing Foundation**
  Monitoring the progress of the cleanup of the UNOCAL site. Educating the community about the status and progress of the UNOCAL cleanup site.
- **Georgetown Community Council**
  Providing informational meetings/workshops for the community about the Phillip Services Corporation site cleanup.
- **Columbia Riverkeeper**
  Educating/motivating the public to be active participants in the Hanford cleanup. Focusing on risk assessments for the River Corridor and the 200 area, appropriate cleanup for the 300 area, waste sites assured to have comprehensive assessments on waste streams, and tracking the tank waste EIS to assure protection of groundwater and the Columbia River.
- **Skykomish Environmental Coalition**
  Continuing to provide information to the community and encouraging their involvement in decision-making processes to cleanup the old BN/SF refueling/maintenance site in Skykomish. Excavation of the Levee Area and the river will be the first steps in the cleanup of the site.
- **Heart of America**
  Assuring public values are heard and incorporated into the decision-making process for the Hanford site cleanup.
- **Center for Justice**
  Engaging the community in the Spokane River cleanup by using the media to focus attention on the river cleanup.
- **Bellingham Bay Foundation**
  Providing education/outreach on the Whatcom Creek cleanup.

Partnering for the Environment through Sustainable "Green" Building

In 2006, Ecology's Green Building Team continues working on the *Beyond Waste* initiative to make green building a common practice. In 2005, we increased our green building staff statewide. During 2006, staff made significant progress on many of the *Beyond Waste* Green Building Initiative goals.

Two Green Building Team members are now LEED-Accredited professionals. (LEED is the US Green Building Council's green building certification program.) Two staff successfully completed the Sustainable Building Advisor Course, and one became a Certified Sustainable Building Advisor. One staff member is a Certified Charrette Planner. These credentials and

additional knowledge enhance our ability to support the expansion of green building in Washington.

Some highlights of our accomplishments include:

- Conducted a workshop on Indoor Air Quality at the Office of State Procurement Annual Vendor Fair.
- Conducted two workshops on green building for grant recipients in partnership with the state department of General Administration and the Cascadia Region Green Building Council. Building projects receiving grant funding from the Capital Facility Grant program (through the Washington State Community Trade and Economic Development Department) must comply with the provisions of *RCW 39.35D, the High-Performance Public Building law* that requires green buildings.
- Worked with Ecology's Water Resources Program and the Office of Regulatory Assistance to help a local building project overcome a regulatory barrier in obtaining water rights. The project included a non-consumptive open-loop geothermal heating system. By interpreting the energy savings benefits of these systems as a substantial environmental benefit, we were able to gain priority processing for water rights. This interpretation is currently assisting numerous projects statewide obtain priority processing for non-consumptive water rights for these highly energy efficient heating systems.
- Partially funded King County pilot project to use mechanically-assisted deconstruction techniques on three public housing units at the Greenbridge project site in Seattle. The project results and final report should help promote mechanically-assisted deconstruction over traditional building demolition which produces large amounts of waste.
- Provided ongoing assistance in creating Built Green Washington, a cooperative of Washington's green home building programs. This group helps home builders and home buyers get the information needed to build and buy green. For more information visit their website, www.builtgreenwashington.org/
- Organized and facilitated four introductory and intermediate green building trainings with the Cascadia Region Green Building Council in Spokane. A total of 100 people attended the trainings: Dollars and Sense – Green K-12 Schools; EQuest: Introduction and Intermediate; LEED and Green Building; and Succeed at LEED.
- Coordinated with the Community Colleges of Spokane to bring the Sustainable Building Advisor National Certificate training program to Spokane for the 2006-2007 school year.
- Started the Inland and Tacoma-Olympia LEED User Groups, and currently serve on the steering committees of the Spokane and Tacoma-Olympia branches of Cascadia Region Green Building Council. The monthly LEED User's Groups (LUGs) provides informal training sessions on how to qualify for specific points in the LEED system. Generally about twenty to thirty people attend each monthly session.

- Assisted the City of Seattle's Departments of Planning and Development and Fleets and Facilities recommending strategies to make the remodeling and seismic retrofit of their historic fire stations more sustainable.

Grant –Funded Projects Support the Beyond Waste Goal of Increasing Green Building

The projects listed below have received either Coordinated Prevention Grant (CPG) funding or Public Participation grant (PPG) funding:

- **City of Bellevue Sustainable Building Workshops - CPG funding**
  This project provided workshops for residents interested in learning about sustainable building techniques and practices that can be accomplished at their own homes. The first series of workshops focused on window replacement as a form of energy conservation. A survey conducted six months after the first class revealed that, of the 46 people that attended, nine have replaced their windows and three are in the process of replacing them.
- **Benton-Franklin County, Master Gardener Foundation Green Building Project - CPG funding**
  Recycled plastic landscape timbers that are arsenic-free, lightweight and will not rot or decay were used for some of the 21 demonstration gardens which began construction on the 1.5 acre site in the spring of 2000. By installing these recycled plastic timbers, this project provided a positive example of attractive, long-lasting recycled materials that educates residents and visitors about recycling and use of sustainable products.
- **Jefferson County Environmental Health, Green Building program - CPG funding**
  The county worked with the local homebuilders association to help promote the local Built Green Program. Six contractors built projects using "green" technology.
- **Economic Development Council of Snohomish County for Sustainable Development Task Force – PPG funding**
  The purpose is to educate communities, builders, developers and governing bodies about the benefits of sustainable building and assist in the development of a plan that promotes sustainable planning, design and construction.
- **Olympia Master Builders – PPG funding**
  The purpose is to promote construction using resource-efficient building practices and to educate builders on how to reduce construction waste, use energy-efficient building materials and encourage participation in the Built Green program.

Partnering for the Environment through Recycling and Beneficial Use of Organic Materials

In 2005, the Solid Waste and Financial Assistance Program (SW&FAP) began carrying out one of the priority *Beyond Waste* initiatives - to expand and strengthen the closed-loop reuse and recycling system in Washington for organic materials. To meet the needs of the initiative,

SW&FAP increased organics specialist staffing levels at its HQ office, to provide statewide technical and program assistance.

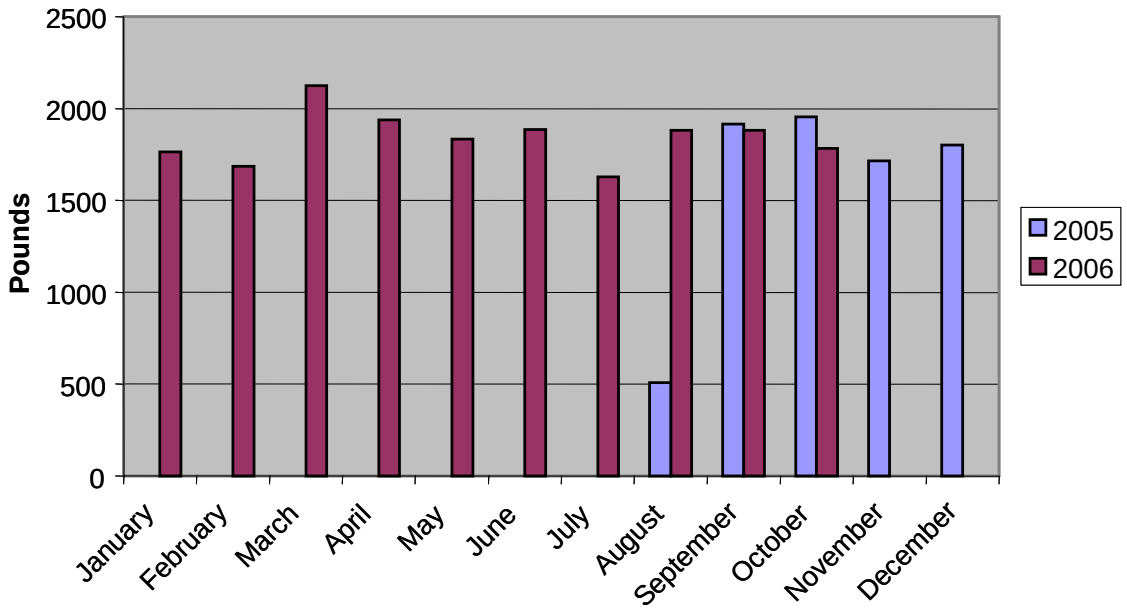
Leading by Example in Organics Management

On-Site Composting at Ecology

Headquarters (HQ) and Southwest Regional Office (SWRO)

From August 2005 to August 2006, Ecology's on-site Compost Center in Lacey processed over 22,000 pounds of food scraps and paper towels (See Table 2.1). Janitors collect the food scraps each night and deliver them to the Compost Center (a.k.a. the old surplus storage area.). The next morning, Ecology's landscaper loads the food scraps and paper towels into an Earth Tub.

Table 2.1
Monthly Organics Collection at Ecology's On-site Compost Center in Lacey (2005-2006)



Along the way, several changes in the original plan have been made. Instead of feeding the compost from the Earth Tubs to the worms, we are distributing the compost directly from the Earth Tubs.

Each finished batch of compost weighs between 500 and 1,000 pounds, depending on the amount of food scraps processed. Ecology's Lacey employees are

Earth Tubs at the Compost Center

randomly selected to receive finished compost when their names are drawn from the Compost Lottery List.

Ecology has completed *Food Scrap Management Guide for Institutions and Agencies,* available at http://www.ecy.wa.gov/programs/swfa/compost/.

Institutions and agencies can use this manual to create a plan to manage their organic scraps either on-site or off-site. This manual also documents Ecology's successes and challenges developing and operating an on-site composting program.

Eastern Regional Office (ERO), Spokane, WA

Worm Wigwam

In August 2005, staff in the ERO office began collecting organic material to feed worms in the Worm Wigwam. The Worm Wigwam is capable of recycling 7 to 14-pounds of organic material per day into a nutrient-rich soil amendment, worm compost. The worm compost is used on ERO's grounds for landscaping, for employees' personal potted plants, or is donated to other groups. Each coffee bar and lunch room is equipped with a covered 3-gallon bucket to collect food scraps (except meat and liquids) and other plant-based materials, such as fruits, vegetables, and paper towels. Volunteers empty the collection buckets on a weekly or twice-weekly basis.

BioStack Vermicomposter

Northwest Regional Office (NWRO), Bellevue, WA

The lunchroom at NWRO has a covered coffee grounds bucket and a covered food scrap bucket. The coffee grounds are kept separate because they will hold longer and can be composted separately if the system is being overloaded with other scraps. The collected food scraps typically include peelings, rinds, unwanted fruits, veggies, bread, napkins, tea bags and floral scraps. Volunteers empty the buckets every other day, chop the scraps into small pieces then add them to a BioStack vermi-compost system with shredded newsprint. This system can handle about 8-pounds of chopped material per addition, depending on season (if it is warm outside the worms are more active and will eat a greater volume of material). The staff uses the worm castings to enrich NWRO's public demonstration garden and provide Earth Day giveaways for employees' home gardens.

Central Regional Office (CRO), Yakima, WA

A group of CRO Ecology employees developed a voluntary compost program. Each week the volunteers take food scraps from their office kitchen area and add them to their own home

compost piles. The compost buckets in CRO's kitchen areas have tight lids for holding the food scraps for as long as a week. This voluntary system diverts approximately 5-pounds of food waste from the dumpster each week.

Grant–Funded Projects Support the Beyond Waste Goal of Increasing Residential and Commercial Organics Recovery Programs

The projects listed below are receiving either Coordinated Prevention Grant (CPG) funding or Public Participation grant (PPG) funding:

- **Thurston County, Food Waste Composting Project - CPG funding**
  Thurston County worked with 10 neighborhood associations to promote food waste composting. They sold 486 compost bins at a subsidized cost and noticed food waste in the county waste composition fell from 15.5% to 13.6%.

- **Stevens County Department of Public Works, Mobile Chipping Events - CPG funding**
  Stevens County purchased a grinder to turn woody debris into a useable soil amendment. The County partnered with the local fire district and the Department of Natural Resources (DNR) to hold mobile chipping events each spring and fall throughout the county. The fire department saved money by not responding to outdoor burning complaints.

  This project resulted in the chipping of about 600 tons of yard and garden waste for the two-year period. At the events, local participants received information about backyard composting workshops and a composting bin upon completion of the workshop. As a result of these projects, residents have been provided with viable alternatives to burning or disposal of the material in the landfill.

- **Kittitas County Solid Waste, Composting Program-CPG funding**
  Held an annual "Master Composter Class." Composting displays and materials were provided at the county fair and other local events. Pallets of worm bins and Earth Machine compost bins were purchased to re-sell to the public at county's cost. Twice a year, through the transfer station, a "Yard Waste Mulch" program gives back all chipped yard waste to residents to use as mulch.

- **King County Northwest Natural Yard Days-CPG funding**
  King County's Northwest Natural Yard Days (NNYD) program is in its ninth year. Its success is largely due to its strong partnerships among state and local government agencies, cities, and local water providers

  During the 2004-2005 CPG cycle, King County's NNYD program sold 5,246 mulching mowers, increasing sales by 71% over 2003. TV air time, print advertising and online media spots were seen 18.7 million times. Sales of environmentally preferable yard care products increased.

- **City of Seattle Natural Soil Building-CPG Funding**
  Seattle works with King County to carry out the program with activities including:

recruiting and training city residents as "Master Soil Builders" and "Master Composters" to help target specific neighborhoods; distributing natural yard care educational materials and home composting bins; and conducting the continuing "Home Organics Waste Management Survey" to collect data on program accomplishments.

During the 2004-2005 CPG biennium, Seattle's Natural Soil Building program had the following outcomes:

- Diverted 771 tons of organic materials from the waste stream and used in Seattle residents' yards.
- Trained 61 Master Composter/Soil Builder volunteers.
- Provided 2,510 hours of outreach by volunteers.
- Made 16,013 public contacts by hotline staff.

- **King County Suburban Cities Home Composting Promotion-CPG funding**
  The organics diversion promotional activity includes subsidized compost bin sales and compost bin giveaways. During the 2004-2005 CPG cycle, cities distributed over 1,130 compost bins. An estimated 377 tons of yard and food waste was diverted from the landfill. This amount of waste will continue to be diverted for the life of the bins.
- **City of Kirkland Food Waste Diversion Program-CPG funding**
  The food debris reduction program distributed over 12,000 food waste collection bins to Kirkland single-family households. The City surveyed residents who participated in the program and found over three-fourths of the respondents said they noticed a decrease in the trash placed out for pickup. This new garbage and food debris reduction program reduced the City single-family residential solid waste stream by 2,083.5 tons of material.
- **City of Redmond Food Waste Diversion Program-CPG funding**
  In March 2004, Redmond began offering curbside collection of food waste to all single-family households. To encourage households to participate and to provide them with the information they needed to identify and correctly prepare materials for collection, Redmond gave each household a kitchen counter-top bucket to collect food scraps, a sticker for the bucket and an information card with a magnet to attach to refrigerator or cabinet. They also ran four-color ads in the local newspaper promoting food waste recycling. Redmond succeeded in recruiting 25% of eligible households (2,500).
- **City of Shoreline Natural Yard Care Events & Workshops-CPG funding**
  In 2004, the City of Shoreline sold natural yard care products at a low cost or gave them away free. These products included long-handled weed pullers, *Safer* soap, and coupons for organic lawn fertilizer. In 2005, products included rain barrels made from recycled plastic containers, 25-lb. bags of organic lawn food, and Pesticide Free Zone signs. In addition, residents purchased 500 bags of organic lawn food instead of chemical fertilizers, significantly reducing or eliminating the use of toxic products on their lawns.

Increasing Knowledge of Healthy Soils

In February 2006, Ecology worked with Grant County Conservation District, Washington State University and other partners to sponsor a "Building Soils for Better Crops" workshop. The workshop, held in Moses Lake, featured speakers from around the state who spoke about the logistics of collecting, processing and using organic material in an agricultural setting.

The workshop was well attended by farmers, and state and local government regulators, engineers and educators. Many attendees also heard about "Triple Bio" – bioagriculture, bioenergy, and bioproducts, for the first time.

In June 2006, the same group of partners sponsored a field day, the next phase of the "Building Soils for Better Crops" workshop. Topics included soil profiling, composting in aerated static piles, incorporating compost into fields at agronomic rates, plant growth examples in amended and non-amended soils, and blending organics to create optimal soil amendments.

Home Composting

In 2005, Ecology conducted a statewide Home Composting Survey identifying several activities to improve home composting statewide. To meet these needs we are working on the following:

- Developing a state-wide "master" composter curriculum.
- Providing a centralized educational resource for counties.
- Promoting peer to peer networking opportunities.
- Providing technical assistance to program coordinators.

Using a grant from US EPA Region 10, Ecology and partners from around the state helped meet some of these needs with a compost educators' workshop held in Ellensburg October 2006. This workshop created a peer-to-peer opportunity for home composting educators. They modeled successful strategies and shared outreach materials (brochures, signs, displays and presentation materials). The Workshop laid the foundation for building a network to link successful and inexperienced programs statewide.

A CD containing "canned" presentations on home composting, brochures and outreach materials was created for each workshop attendee. A "master" composter training manual will be created and distributed for use by program coordinators to train additional staff and volunteers.

Workshop attendees received tools, contacts and inspiration to improve old programs or create new programs promoting residential food waste and yard debris home composting statewide. These programs can be carried out with the staff (local government, private or non-profit) available in the existing community.

Commercial Composting

Composting is a key element of the state's goal of creating a closed-loop system for recycling organic materials. Reaching the goal depends primarily on the success of the composting facilities which process those materials. (See http://www.ecy.wa.gov/programs/swfa/solidwastedata/ for the facilities reporting composting activities in calendar year 2005.)

Twenty-nine commercial compost facilities reported recycling organic material in Washington in 2005. They transformed 769,145 tons of organic waste, including (in order of quantity recycled):

- Yard debris.
- Miscellaneous material including food waste.
- Wood waste and sawdust.
- Manure.
- Biosolids.

From this organic waste material approximately 350,405 tons of finished compost was produced. The compost was sold or stockpiled for future sales.

Composting facilities are regulated under chapter 173-350 WAC, *Solid Waste Handling Standards* (WAC 173-350-220, *Composting Facility Standards*). The composting standards include design and operating requirements for permitted facilities. In addition, testing criteria must be met in order for the final product to be considered "composted material".

WAC 173-350-220, *Composting Facility Standards* also offer several categories of composting activities which are exempt from solid waste permit requirements. The exemption categories were designed to "promote composting while protecting human health and the environment." Ecology has worked with Washington State University Cooperative Extension researchers, consultants, and local governments to educate potential composters about the new opportunities and their responsibility to use best practices when composting even small volumes of material.

Ecology is supporting composting and compost use by training compost facility operators. We also are partnering with Washington Department of Transportation promoting compost use for erosion control and stormwater management.

Cross Agency Bioenergy Team

Ecology, working with the Washington Department of Agriculture, Center for Trade and Economic Development, Washington State University, and Washington Department of Transportation, is developing a Bioenergy strategy for Washington State. Each agency has a unique role in funding bioenergy research and providing technical assistance to businesses and other agencies. These efforts will help create a "road map" as Washington State focuses on reducing impacts from burning fossil fuels.

Compost Facility Operator Training

Ecology believes operator training is essential to a successful composting industry. Ecology supports the Washington Organic Recycling Council's well-received training workshop, usually held in the fall. In 2001, the Washington Organic Recycling Council revised the five-day curriculum to focus on the biology of composting, reinforced with hands-on field activities. The new format continues to receive enthusiastic reviews by people attending the workshop.

The new format also emphasizes "starting with the end in mind." Composting creates valuable products. It doesn't just get rid of solid waste. Analyzing end-use markets is an important beginning step in planning any composting operation. Developing and expanding end-use markets for compost products is crucial to closing the loop for recycled organic materials. Training on the value of compost products will build a critical mass of people who understand the importance of compost end-use in protecting the environment.

In October 2006, 32 people from around Washington State attended the training. Folks from Oregon, British Columbia and California were also present, including the President of the US Composting Council. The attendees represented local government, operators and owners of compost facilities, and regulators from various health districts. As they built compost piles early in the week, one attendee explained, ". . . [this training] provides a non-threatening forum for regulators and operators to come together and learn about composting. [We're] creating a culture of cooperation and mutual understanding."

Biosolids

Managing biosolids by recycling/beneficial use is the main choice in Washington. Ecology's biosolids program supports the state's goal and statutory preference for the beneficial use of biosolids. In accordance with chapter 70.95J RCW, *Municipal Sewage Sludge – Biosolids,* municipal sewage sludge that meets the quality standards for beneficial use is considered to be "biosolids" and is regulated as a commodity, not as a solid waste. The statute further directs that biosolids be beneficially recycled to the maximum extent possible. We strongly encourage all producers of biosolids to pursue beneficial use.

Total production of biosolids within the state in 2005, was approximately 97,000 dry tons. Of this amount, about 81% was land applied or otherwise beneficially use, about 15% was incinerated, and about 4% was landfilled. The amount of biosolids stored from year to year is

difficult to account for with our current tracking system and is not included in the above estimates.

Permit Program

Biosolids management is regulated through chapter 173-308 WAC, *Biosolids Management* (the state biosolids rule), and the statewide *General Permit for Biosolids Management* (biosolids general permit). Ecology staff, with assistance from local health departments (JHDs), carry out the state biosolids program.. The biosolids rule went into effect on March 21, 1998. The current biosolids general permit became effective on June 5, 2005. This permit will expire June 5, 2010.

The biosolids general permit governs the quality of biosolids applied to the land or transferred to other facilities, and the practices at land application sites. Biosolids must meet standards for pollutant limits, pathogen reduction, and vector attraction reduction appropriate to the intended end use. Biosolids used where future exposures are uncontrolled (e.g. lawns, home gardens, golf courses, top soils, etc.) must meet higher standards than biosolids that are applied to areas where access and crop harvest restrictions can be put in place.

There are 377 facilities expected to require coverage under the biosolids general permit. The permit applies to all "treatment works treating domestic sewage" that:

- Prepare biosolids for beneficial use.
- Apply biosolids to the land.
- Transfer biosolids or sewage sludge to or from another facility.
- Dispose of biosolids or sewage sludge in a municipal solid waste landfill.

The majority of affected facilities are publicly owned wastewater treatment plants, privately owned wastewater treatment plants that treat only domestic sewage, and similar state and federal facilities (military bases, prisons, parks, etc.). Other types of facilities that may be required to seek coverage under the biosolids general are: certain composting facilities that treat biosolids as a feedstock, beneficial use facilities (private parties who seek permit coverage as a means of promoting their services by shifting administrative permitting burdens from their public/private clients to themselves), and septage management facilities.

Coverage under the general permit is provided in two phases:

1. Provisional approval, and
2. Final approval

"Provisional" approval is obtained by a facility submitting a *Notice of Intent* and a complete *Application for Coverage* as provided in the rule and general permit. Under provisional approval, a facility is authorized to carry out biosolids management activities according to the conditions of the general permit, conditions in any submitted plans, conditions in the state biosolids rule, and conditions in any other applicable state, local, or federal regulations.

"Final" approval may be granted after Ecology review of the permit application and operating practices. In issuing final approval, we may impose "additional and more stringent" conditions deemed necessary to ensure proper biosolids management. Any such conditions are subject to appeal.

Under the first general permit, which was in effect from March 1998-May 2005, Ecology issued final coverage to 85 of the facilities who applied for coverage. Between June 2005 and September 10, 2006, Ecology has issued final coverage to 103 facilities under the current general permit. By streamlining the process and making more effort to determine who needs permits, we expect that the rate of final approvals provided during the current permit cycle will be much greater than that during the first permit cycle.

Delegation to Local Jurisdictions Health Departments (JHDs)

A total of eleven JHDs have accepted some degree of delegation for carrying out the state biosolids program. Each of those JHDs has entered into a formal *Memorandum of Agreement* with Ecology. The delegated JHDs have actively taken the lead in conducting various aspects of the biosolids management program within their jurisdiction. Most other JHDs provide varying degrees of assistance to Ecology. Funding and workload demands on staff continue to be the major reason given by JHDs when choosing not to pursue delegation of the biosolids program. It is expected that shortfalls in county budgets and limited staff resources will continue to be a barrier to our biosolids program delegation efforts.

Rule Revision Efforts

Ecology is revising the current state biosolids rule, *chapter 173-308 WAC, Biosolids Management,* with assistance from a group representing interested parties across the state. Rule revisions are necessary to:

- Improve the permitting processes.
- Address inconsistencies in septage management requirements.
- Create a more equitable program implementation fee.
- Clarify previous rule interpretations and policy decisions.
- Correct inconsistencies between the biosolids rule and the biosolids general permit.

Currently septage management facilities are paying fees that cover only an estimated 12% of our staff time used for this facility type. Facilities that manage only biosolids (not septage) are covering an estimated 81% of the estimated program staff time devoted to these facilities. There is a need for a new fee structure that better covers staff time and is more equitable. Ecology anticipates that a final rule will be in-place by June 30, 2007.

Partnering for the Environment by Implementing the Small-Volume Hazardous Waste (aka Moderate Risk Waste (MRW)) Initiative and Reducing Threats from Priority Waste Streams

In 2005, the Solid Waste and Financial Assistance Program (SW&FAP) began carrying out one of the priority *Beyond Waste* initiatives - to reduce threats from small-volume hazardous wastes and materials. Progress is being made on a number of *Beyond Waste Pla*n recommendations, and also on some additional high-priority waste streams.

The term "moderate risk waste" (MRW) was created by revisions to Washington State's 1986 Hazardous Waste Management Act (RCW 70.105). MRW is a combination of household hazardous waste (HHW) and conditionally exempt small quantity generator (CESQG) waste. HHW is waste created in the home, while CESQG is small quantities of business or non-household waste. Both HHW and CESQG waste are exempt from hazardous waste regulations.

Ensuring Facilities that Manage MRW are in Full Compliance with Rules

The regional Ecology MRW Specialists have done compliance reviews at all permitted MRW collection facilities. A strategy is being developed to provide assistance to facilities not complying with *WAC 170350-360, Moderate risk waste handling*.

Reducing Threats from PBDEs

The PBDE Draft Chemical Action Plan was completed in January 2006. Responses to the plan were received until May 2006. Ecology and the State Department of Health recommend in the Chemical Action Plan that the Legislature immediately ban two forms of PBDEs known as penta and octa. Further the plan recommends that use of the third PBDE, deca, be banned provided that safer, effective alternatives are identified, or upon additional evidence of deca harm.

Since the plan's adoption, a PBDE End-of-Life External committee met several times. A sampling plan for four focus areas is being developed (landfills, auto recycling, electronics recycling and waste water treatment/biosolids). The Departments of Health and Ecology have identified safer, effective and affordable alternatives for deca-BDE in mattresses and are searching the literature for evidence of safer alternatives for upholstered furniture.

Electronics Product Stewardship Infrastructure

Ecology is working with manufacturers developing the administrative system and Washington Materials Management and Financing Authority to support an electronics product stewardship infrastructure. Two administrative rules have been developed. A new group, the Washington Materials Management and Financing Authority, is being formed to manage the covered electronics. (See Chapter 1 for more details about the Electronics Products Recycling Law.)

Reduce and Manage All Architectural Waste Paint

There are two ongoing Northwest Product Stewardship Council initiatives moving forward to manage leftover architectural paints:

- Ecology, in partnership with interested paint manufacturers and recyclers in the northwest, is developing a strategy or campaign to increase the demand for recycled content paint. The concept is to develop a pilot project to market recycled content paint in the Puget Sound and to find ways to encourage purchase of recycled content paint by state and local governments. This northwest project is also using the new Greenseal/Master Painters' Institute Standard T-43 as a quality and green paint standard to promote use of quality recycled content paint.
- The Northwest Product Stewardship Council is also an active participant in the national Paint Product Stewardship Initiative (PPSI). This initiative developed the new Greenseal/Master Painters' recycled paint standard. The PPSI stakeholders are working with the National Paint and Coating Association (NPCA) to conceive of how a nationwide management system for leftover paint might work. This process will be culminating in 2007 with final decisions by the industry on how, and whether, to move forward with a national system.

Cleaning out Unwanted Medications: Rx is Product Stewardship

Almost every household has them: unwanted, expired, and forgotten medications, ointments, inhalers, and vitamins. As pharmacists hand out more and more medications each year (the number of US prescriptions sold have increased 70% from 1993-2003), unused medications accumulate in peoples' homes until people are faced with cleaning out their (or a deceased relative's) medicine cabinet.

About two-thirds of households surveyed have some portion of medications that they do not plan to use, but how much waste out there is unknown. People will eventually dispose of these medications with the garbage (36.5%) or in a sink or toilet (29.4%), according to a 2005 King County Department of Natural Resources survey. Though there is an obvious need, numerous barriers have prevented pharmacists from providing safer avenues of disposal for medications that are no longer needed.

Consequences

Once medications go in the garbage or down the drain, they enter the environment, primarily through discharged wastewater or accumulation in biosolids. Not only are the actual drug formulations now being detected at low levels by scientists, metabolites (breakdown products of drugs) are also being found. There are not clear and obvious connections to environmental impacts, but one recent Italian study (2006) investigated the effects of 13 drugs combined to mimic levels detected in the environment finding:

- At environmental exposure levels, the drug mix inhibited the growth of human embryonic cells.

- Results suggest that a mixture of drugs at ng/L levels can inhibit cells production by affecting their physiology and morphology.

Other data conclusively links pharmaceuticals and personal care products to effects on aquatic organisms, which leads to questions regarding human health impacts.

Barriers to Collection

Medications come in a mind-numbing range of chemical formulations—about 8% designate under federal hazardous waste criteria, but many others, including aspirin, will designate under Washington State criteria for persistence and toxicity. To add another layer of complexity, the Drug Enforcement Agency regulates 27,000 drugs, and its rules explicitly state that those drugs, once prescribed, cannot be returned to the pharmacist (or anyone else, for that matter). The problem is that it is almost impossible to tell from the label if the drug is controlled.

It is also very expensive and difficult to treat pharmaceuticals and metabolites in wastewater. Since disposal to the sewer, septic tank, and landfill is a known and preventable source of pharmaceutical pollution, a group of 12 local and state governments, non-profits, and private partners have worked to create a take-back network for waste pharmaceuticals from residents.

Governments have typically tried to solve problems such as these. In the solid and hazardous waste fields we spend a lot of time and money trying to provide collection services. With pharmaceuticals, it is not the best or most appropriate solution.

Many other states are considering using the Household Hazardous Waste (HHW) facilities to manage medications. In Washington, HHW facilities will likely need to operate under the wholesaler rules and the Board of Pharmacy. It is also illegal for these facilities to accept controlled substances for disposal. Finally, most people will not likely use the HHW facility for their medications, meaning that the problem of waste medications in the environment will persist. The 2006 survey showed that:

- 84% of respondents indicate a local pharmacy would be the most convenient location to dispose of unused or expired medicines.
- 4% said they would be willing to use the sheriff or police office.
- 5% said special collection event.
- 2% said public hazardous waste facility.

Solutions - Pharmaceuticals from Households: A Return Mechanism (PH: ARM)

Our coalition, called PH: ARM (Pharmaceuticals from Households: A Return Mechanism) is using the framework of the Interagency Resource for Achieving Cooperation to develop a more sustainable and long-term approach.

One of the first difficulties the group must solve is the regulatory barrier. Currently, take-back of pharmaceuticals (because there are controlled substances in the mix) is not legal. If controlled substances were excluded, then it would be possible for pharmacy take-back, but this would not be entirely user-friendly.

The PH: ARM model is based on product stewardship programs in British Columbia and Australia. These approaches are extremely cost-effective and are either entirely funded or partially funded by the pharmaceutical industry. If we extrapolate British Columbia collection data to Washington, we will collect 83,000 pounds of medications, which includes 7,300 pounds of controlled substances. That is over 68 million pills!

PH: ARM strongly feels that the most logical place to return medications is where you purchase them. The first phase of this approach is at clinical pharmacies, which was launched in summer 2006. Coming phases will include retail pharmacies, nursing homes, animal clinics, and boarding homes.[5]

Grant – Funded Projects Support the Beyond Waste Goal of Reducing Threats from Household and Small Quantity Hazardous Wastes and Materials

The projects listed below have received either Coordinated Prevention Grant (CPG) funding or Public Participation grant (PPG) funding:

- **Thurston County, Fluorescent Bulb Take-Back Project-CPG Funding**
  Thurston County partnered with 3 businesses establishing collection points for 1,812 fluorescent bulbs or 906 pounds of waste. Through education efforts and a post survey it was found that the number of people recycling fluorescents at the Hazohouse increased from 18% to 42% in 2004. The number who disposed of fluorescents in the trash decreased from 21% to 18% in 2004.
- **Grant County Solid Waste, Mercury Thermometer Exchange Program-CPG Funding**
  Grant County Solid Waste partnered with the Health District offering an annual Mercury Thermometer Exchange Program at local health fairs through out the county. Residents could also bring in a mercury thermometer for exchange at the Health District offices and the Public Works Office during promotional events throughout the year. Approximately 100 thermometers were exchanged and disposed of through this program.
- **Yakima County Public Works, Household Hazardous Waste Collection and Disposal-CPG Funding**
  This ongoing project collects hazardous wastes at the Cheyne Landfill and Lower Valley Transfer Station. The materials collected included paints, paint-related products, and mercury. The mercury is collected by crushing fluorescent lights, and separating out the mercury. The glass was also recycled. The project did better than predicted, surpassing its "900 plus tons" of hazardous waste goal with 1,530 tons being collected over two-years.

[5] For more information about the pilot, visit http://www.productstewardship.net, or contact Emma Johnson Project facilitator, Ecology, ejoh461@ecy.wa.gov or 425-649-7266.

- **Kittitas County Solid Waste, Persistent Bioaccumulative Toxins (PBT) Program-CPG Funding**
  Kittitas County has an ongoing mercury collection and outreach program, exchanging mercury thermometers for digital ones. All of the pharmacies in the county have agreed to phase-out mercury thermometers.

  Articles in local newspapers also inform the public about the hazards of PBDE's.

- **Washington Toxics Coalition-PPG Funding**
  Provide educational tools to increase awareness of the dangers of pesticides and hazardous household cleaning products and options to using these products. Expand the Pesticide Free Zone campaign, improve the Toxics Hotline, and broaden their website services.

- **Walla Walla Resource Conservation Committee-PPG Funding**
  Educate the public on ways to reduce, reuse, and recycle; and sponsor a one-time electronics (computer) recycling event in Walla Walla.

- **Re Sources for Sustainable Communities – PPG Funding**
  Provide education and outreach about computers as hazardous wastes. Establish a computer recycling program at the Bellingham RE Store.

- **Automotive Recyclers – PPG Funding**
  Provide vehicle recyclers statewide with free comprehensive cross-media hazardous waste, stormwater and air emissions management inspections. Provide technical assistance in order to reduce the release of hazardous substances.

- **Spokane Neighborhood Action Programs – PPG Funding**
  Increase the knowledge and practice of the "Living Green Program" among all residents by educating the communities with workshops, classes, at-home parties, and training educators.

- **Puget Soundkeeper Alliance – PPG Funding**
  Through the involvement of the counties' EnviroStars program, promote reduction and proper management of hazardous wastes by outreach to marinas in the Puget Sound.

- **Eco Solutions – PPG Funding**
  Provide education/outreach about the effects of toxic lawn and garden chemicals and emissions on human health and the environment in Kitsap County.

Partnering for the Environment through Environmentally Preferable Purchasing (EPP)

Environmentally Preferable Purchasing (EPP) involves considering environmental and human health effects when purchasing decisions are made. Environmentally preferable products can include recycled content, lower toxicity, less packaging, reusability, energy savings, or lower air quality impacts.

A central strategy of the *Beyond Waste Plan* is increasing the purchase of environmentally preferable goods and services, especially by government. Several of the *Beyond Waste* key

initiatives include recommendations on EPP to reduce waste and toxins, foster green building practices, and increase demand for organic-based products.

Washington state agencies, local governments and school districts purchase about $4 billion of goods and services each year. Many of these purchasing decisions negatively impact human health and our environment. Buying products and services that have reduced impacts on human health and/or the environment yield many benefits, including creation of new business opportunities for suppliers.

Ecology has created an EPP staff team, and has hired new staff to work on promoting EPP, especially within state and local government. The EPP team works collaboratively with the Office of State Procurement (housed at the state Department of General Administration) to increase EPP. In November 2006, we supported the annual statewide vendor fair held for state and local purchasers. Special training sessions were also offered at the vendor fair and at other venues on:

- EPP Basics.
- Toxics in Products.
- Making the Business Case for EPP.
- Greening Your Meetings and Conferences.
- Use Less Paper.

Ecology's EPP team also offers technical assistance and is developing web-based tools to assist agencies and local jurisdictions with EPP.

The importance of EPP has been emphasized by Governor Locke in Executive Order 02-03 *Sustainable Practices by State Agencies*, issued in 2002. It directs state agencies to establish sustainability objectives. They were to prepare a biennial Sustainability Plan modifying their practices regarding resource consumption, vehicle use, purchase of environmentally preferable goods and services, and facility construction, operation, and maintenance.

Governor Locke also issued Executive Order 05-01 *Establishing Sustainability and Efficiency Goals for State Operations*, in 2005. It directs state agencies to establish specific targets and requires action in several areas that involve environmentally preferable purchasing. In 1991, the Legislature in *chapter RCW 43.19A, Recycled Product Procurement*, directed all state agencies, local governments and school districts to substantially increase the purchase of recycled content products.

A few examples of EPP in state and local government include:

- The Department of Correction's Stafford Creek Corrections Center is relamping with more energy efficient fluorescent lamps. Over the life of each of the 12,000 lamps in the facility, there is an expected annual energy savings of at least $11,000. The new lamps have only 3.5 milligrams of mercury, in the 25-watt lamp, compared to 8 or 9 milligrams in standard 32-watt lamps. Additional mercury will be recovered as the discarded lamps are recycled through Ecolights.

- A new contract is available for recycled-content paint though the Department of General Administration (GA). GA and Ecology have also developed a fact sheet for government procurement agents about recycled content paint and where to buy it on the state contract. This is available on GA contract number 15504 for "Environmentally Friendly Reprocessed Paint" from three paint manufacturing vendors.
- Ecology committed to purchasing and using 100% post-consumer recycled process chlorine free paper for all copy and printing needs. To cover the additional cost, the director issued a challenge to all employees to reduce the amount of paper used through public copying, reviewing documents electronically, and minimizing paper handouts.
- The Department of Corrections uses hybrid vehicles for perimeter control because they are quieter, have better visibility and use less fuel. The Department of Transportation uses hybrid vehicles to save on fuel. Because of the high miles driven by this agency, large cost and emissions savings are gained. Ecology also has many hybrid vehicles in its vehicle pool.
- At the local level, King County and the City of Seattle are national leaders in EPP, and have clearly demonstrated its economic benefits. King County agencies purchased $30.6 million worth of EPP products in 2005, realizing savings of $675,000 over conventional products. These savings came from purchasing remanufactured toner cartridges, shredded wood products, non-toxic antifreeze, plastic lumber, and by retreading tires instead of purchasing new tires. More savings will result as King County agencies pay lower energy bills, replace equipment less frequently, and have lower disposal costs due to purchasing more durable, energy-efficient and less toxic products. Another benefit is the expansion of markets for less toxic products and services as large institutional purchasers increase their EPP purchases.

Partnering for the Environment Through Beyond Waste Performance Indicators

Ecology is developing performance indicators to track progress toward the *Beyond Waste* goals and vision this year. Performance indicators for the major beyond waste initiatives, industries, green building, organics recycling and small-volume hazardous wastes, will be included in a new *Beyond Waste* progress report. Additional indicators will also be included. Long-term indicators are also being developed to track progress toward the *Beyond Waste* thirty year vision of eliminating most wastes and uses of toxics. The long-term indicators will be developed for the 2008 progress report.

The *Beyond Waste* progress report is available at the *Beyond Waste* website, www.ecy.wa.gov/beyondwaste/.

Waste Tire Pile Cleanup

The 52 unauthorized tire piles sites in Washington contain approximately 3.1 million waste tires (see Map 2.A). Cleanups are underway at the largest waste tire pile in the state in Klickitat County. Ecology is working with county public health officials to identify priority sites and hire cleanup contractors for the remaining waste tire piles.

Waste tire pile cleanups were conducted in the late-1980s through the mid-1990s using a tire fee established to fund the cleanup activity. Since the waste tire program sunset in the mid-1990s, there has been little progress made in cleaning up the remaining tire piles. Tire piles present a health and safety risk to the public. Many of the remaining tire piles have been in existence for a significant amount of time. These sites continue to be a challenge for local officials responsible for cleaning up unauthorized dump sites.

With the passage of SHB 2308 in 2002, Ecology began to report annually to the Legislature on tire use and recycling in Washington. The first of these reports, published in December 2002, "SHB 2308: Scrap Tire Report," contains a comprehensive overview of waste tires in Washington. This report can be downloaded at http://www.ecy.wa.gov/biblio/0207029.html. Subsequent annual waste tire summaries have been provided to the legislature.

The passage of SHB 2085, in 2005, created a Waste Tire Removal Account providing funds for tire pile cleanups. SHB 2085 also required a study of unauthorized tire piles that included a cleanup plan for the remaining sites in the state. This report, "Study of Unauthorized Tire Piles," published in November 2005, contains a list of the sites located in the state. This report can be downloaded at http://www.ecy.wa.gov/biblio/0507043.html.

Tire Recycling and Reuse in Washington

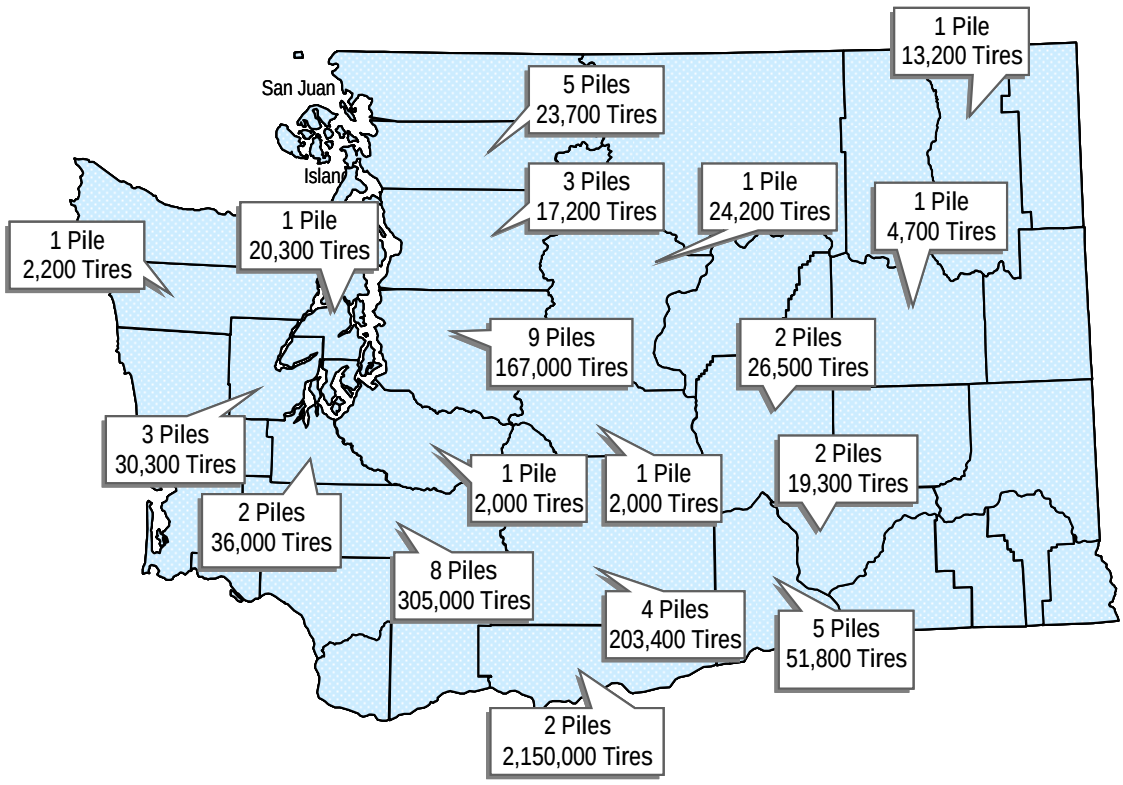
Over 6.6 million vehicles licensed in Washington in 2005, generated approximately 4.9 million used tires. Based on national averages, each licensed passenger vehicle was assumed to generate one used tire each year. Also using national averages, other vehicles, like trucks, trailers, motorcycles, were assumed to generate 0.4 or 0.25 tires each year.

The total number of tire uses reported to Ecology for 2005 is greater than the number of tires generated for the year (Table 2.2). The reported uses of tires in 2005 is higher because it includes tires from storage sites where recycling has been active this year.

Table 2.2
Tire Uses in Washington State for 2005

Reported to Ecology	Tons of Used Tires[6]	Number of Used Tires[7]	Percent
Recapping	4,089	240,529	5%
Recycled	53,777	3,163,353	63%
Tire Derived Fuel	5,167	303,941	6%
Landfill Disposal	22,446	1,320,353	26%
Total Reported	**85,479**	**5,028,176**	**100%**

Map 2A
Unauthorized Tire Pile Sites in Washington
(as of 2005)



[6] Assumes an average weight of 34 lbs per tire: passenger car tires assumed to weigh 20 lbs; truck tires assumed to weigh 100 lbs.
[7] Assumes 40% of trucks use new tires and 60% of trucks use recapped tires.

Partnering for the Environment through Local Planning

Local solid waste planning is the cornerstone of solid waste management in Washington State. The state Legislature asks counties and cities to make sound decisions about solid waste handling and to base these decisions on approved and "current" comprehensive solid waste management plans *(RCW 70.95.110(1))*.

These comprehensive plans detail all solid waste handling facilities within a county. The plans estimate the long-range needs for solid waste facilities over a 20-year period. The state intended these plans to guide a county as it lays the foundations for its solid waste system. Since 1989, the state has required counties and cities to provide detailed information on waste reduction strategies and recycling programs, along with schedules for carrying out the programs. The plans are to be maintained in "current condition."

In 1985, the Legislature amended the *Hazardous Waste Management Act, chapter 70.105 RCW*, to require local governments, or a combination of neighboring local governments, to prepare plans to manage moderate risk waste (MRW). By 1991, all local governments had submitted local hazardous waste plans. Every local hazardous waste plan includes parts on MRW public education, MRW enforcement, household hazardous waste (HHW) collection, and technical and disposal assistance to conditionally exempt small quantity generators (CESQGs).

In 1991, the Legislature enacted the *Used Oil Recycling Act, chapter 70.95I RCW*, which required local governments to amend their hazardous waste plans to include used motor oil from households.

Since the hazardous waste plans have been completed, some counties have revised them. Some have combined their solid waste and hazardous waste plans. One of the recommendations of the *Beyond Waste Plan* is to fully implement local hazardous waste plans.

Ecology provides technical assistance to local governments as they prepare and carry out their plans. Ecology also approves the plans. Table 2.3 lists the local solid waste plans and hazardous waste plans for each county and two cities (Seattle and Everett) that do individual plans.

Table 2.3
Current Status of Solid and Hazardous Waste Plans in Washington
(as of September 2006)

COUNTY	CURRENT STATUS SW Plan (date last approved)	WR/R GOAL	CURRENT STATUS HW PLAN (date last approved)	HW Plan Combined with SW Plan? (yes/no)	COMMENTS
Adams	Yes 1993	50% WR/R BY 2012	1992	N	Comprehensive Solid Waste Management Plan (CSWMP) updated April 2005. Hazardous Waste Plan (HW) is joint among Adams, Lincoln and Grant Counties.
Asotin	Yes 1998	26% by 1997	1993	N	Solid Waste Plan update beginning January 2007. Needed to resolve status of agreements with Lewiston, Idaho. Those were recently resolved, so they are reconvening their SWAC in December to begin plan updates in January 2007.
Benton	Yes 1994	35% by 1995	1991	N	Currently updating CSWMP. Will combine HW Plan into the update
Chelan	Yes 1995	26% by 1995	1991, used oil amendment 1996	N	Will complete the plan update in 2006/early 2007. Will combine HW Plan into update
Clallam	Yes 2000	20% by 1996 40% long range goal	1991	N	Plan is in Preliminary Draft review, expect an adopted approved plan in 2007. Landfill closure in 2006, new transfer station and MRW facility constructed and in operation to coincide with landfill closure. No plans to update HW plan.
Clark	Yes 2000	50% WRR by 1995	2002	Y	Will be amending current SWMP. Draft language will be complete late 2006 and out to ECY for review late 2006.
Columbia	Yes 2003	20% WR/R	1991	N	Plan approved.
Cowlitz	Yes 2000	50% WRR by 1995	1993	N	Completed draft review of CSWMP, now in process of obtaining all resolutions of agreements or Interlocals from local jurisdictions before submitting to ECY for formal review.
Douglas	Yes 2002	25% by 2008	2002	Y	Currently reviewing and will be ready to update plan in 2007.
Ferry	Yes 1993	35% WR/R by 1995 50% WR/R	1994	N	SWAC began meeting in October 2006 to begin the process of updating SWMP after funding for

COUNTY	CURRENT STATUS SW Plan (date last approved)	WR/R GOAL	CURRENT STATUS HW PLAN (date last approved)	HW Plan Combined with SW Plan? (yes/no)	COMMENTS
		by 2013			process was identified. Regional planner will be working with them to identify consultants and encouraging them to take that route for updating. Considering combining SWMP and HW plans, but no decision yet.
Franklin	Yes 1994	35% R by 1995 5% WR by 1998	1993	N	Currently updating CSWMP. Approved planning money in last budget. Received funds from CPG Supplemental. Will be proceeding with update process in December 2006, hoping to complete by June 30, 2007. SWAC has been reconstituted and meets again beginning Nov. 1, 2006.
Garfield	Yes 1993	26% WR/R by 1997	1992	N	Currently updating CSWMP, first draft complete
Grant	Yes 1995	22% WR/R by 2000	1992	N	Currently updating 1999 CSWM Plan. HW Plan is joint among Adams, Lincoln and Grant Counties.
Grays Harbor	Yes 2001	50% WRR by 1995	1991	N	Will begin plan review in December 2006.
Island	Yes 2000	Assist the State in achieving its goal of 50%	2000	Y	Latest CSWMP approved December 7, 2000, which incorporate and updated the HW plan. Currently updating with plan, with expected completion and approval in 2007.
Jefferson	Yes 2000	Minimum 29% long range	1991	N	Will complete plan review in 2007, expect adopted approved plan in 2007. No significant changes in solid waste management system.
King	Yes 2002	50% residential by 2006 43% nonresidential by 2006	1997	N	Latest CSWMP approved May 10, 2002. Plan calls for targets to be evaluated every 3 years as new data becomes available from waste monitoring studies. Because the City of Seattle and King County have independent CSWMPs, the MRW plan remains independent and is administered by the Local Hazardous Waste Management Program. CSWMP revision beginning 2006.
Seattle	Yes 2005	Recycle or compost: 60% of all	1997	N	Because the City of Seattle and King County have independent CSWMPs, the HW plan remains independent

COUNTY	CURRENT STATUS SW Plan (date last approved)	WR/R GOAL	CURRENT STATUS HW PLAN (date last approved)	HW Plan Combined with SW Plan? (yes/no)	COMMENTS
		waste generated in Seattle by 2008			and is administered by the Local Hazardous Waste Management Program. 2004 Plan Amendment Approved August 19, 2005. Next full revision scheduled for 2008.
Kitsap	Yes 2000	Supports the state goal of reaching 50% recycling.	2000	Y	The Kitsap CSWMP includes an update to the 1990 HW Plan. The text is fully integrated into the 2000 CSWMP. Update expected to begin in 2007
Kittitas	Yes 2003	50% by 2008	2003	Y	Plan approved.
Klickitat	Yes 2000	50% diversion	2000	Y	Plan amendment finalized in 2001.
Lewis	Yes 2000	18% WRR by 1995, no goal	2000	Y	Currently updating CSWMP, draft by 2007.
Lincoln	Yes 1992	35% WR/R by 1997	1992	N	Amended CSWMP 1999. HW Plan is joint among Adams, Lincoln and Grant Counties. Planner will be consulting with new public works director to encourage moving ahead with a combined planning process in January. They had been waiting to hear about availability of funds.
Mason	Yes 1998	35% WRR by 1998	1991	N	Review complete, expect preliminary draft in December 2006, expect adopted and approved plan in 2007. No significant changes in SW management. No plans to update HW plan.
Okanogan	Yes 2006	Supports the state goal of reaching 50% recycling	2006	Y	Plan Approved February 9, 2006.
Pacific	Yes 2000	32% WRR by 1996	1990 – 2000 Operations Plan	N	Plan review and update completed by County in 2005, no acceptable submittal received to date. Will need to re-update projections. Expect preliminary draft, adopted and approved plan in 2007. No plans to update HW plan.
Pend Oreille	Yes 2002	45% WR/R by 2015	1993	N	Plan approved.
Pierce	Yes	50% WRR by	1990	N	Updating during 2007.

COUNTY	CURRENT STATUS SW Plan (date last approved)	WR/R GOAL	CURRENT STATUS HW PLAN (date last approved)	HW Plan Combined with SW Plan? (yes/no)	COMMENTS
	2001	1995			
San Juan	Yes 1996	50% by 1995	1991	N	Currently updating CSWMP. Expected completion in 2007.
Skagit	Yes 2005	50% or better by 1995	1992	N	Plan approved on December 2, 2005. HW incorporated.
Skamania	Yes 2002	40% WRR by 1998 50% long range goal	2001	Y	Currently updating CSWMP, April 2006.
Snohomish	Yes 2001	50% recycling goal to be reached approximately 2008	1993	Partially	Latest CSWMP approved July 11, 2001. The recycling potential assessment (RPA) combines two approaches to reaching 50% - a blend of education/ programs and a regulatory approach. The 2001 CSWMP is intended to begin the consolidation of the HW Plan, to update but not replace it.
Everett	Yes 1996	35% recycling by 2005 3% to 5% WR	1993	N	Everett no longer intends to join Snohomish County CSWMP plan, but adopted the Snohomish HW plan.
Spokane	Yes 1998	50% recycling by 2008	1993	N	Currently updating CSWMP.
Stevens	Yes 1994	36% WR/R by 2012	1993	N	Currently updating CSWMP.
Thurston	Yes 2001	Increase recycling rate by 2.5% by 2005	1993	N	In revision process, intend to draft a plan for the county that models the State's *Beyond Waste Plan*. In need of new transfer station and MRW facility. Final plan on track for December 2007. Plans to update HW plan in 2007-2009.
Wahkiakum	Yes 2003	20% WRR by 1996	2001	N	Plan approved.
Walla Walla	Yes 1994	40% by 2002	1991	N	Currently updating 1994 CSWMP. Approximately 60% completed. Incorporating HW Plan as a section of revised CSWMP.
Whatcom	Yes 1999	50% diversion	1991	N	County currently updating CSWMP. Expected completion in 2007. The City of Bellingham is the lead on MRW.
Whitman	Yes	40% WR/R	1992	N	Preliminary Draft submitted and

COUNTY	CURRENT STATUS SW Plan (date last approved)	WR/R GOAL	CURRENT STATUS HW PLAN (date last approved)	HW Plan Combined with SW Plan? (yes/no)	COMMENTS
	1997	by 2001			comments returned to County on CSWMP.
Yakima	Yes 2003	35% by 2005 40% by 2007	1991	N	Plan approved.

Partnering for the Environment through Outreach, Assistance, and Information Sharing

Washington State Solid Waste Information Clearinghouse

In 2007, Ecology plans to launch the web-based "Washington State Solid Waste Information Clearinghouse." A committee with several local government staff has worked with Ecology to plan and develop the information-sharing website. The "Information Clearinghouse" will allow CPG recipients to report work accomplished online and to share lessons learned with others statewide. The system will collect and maintain information about county and city programs. The Clearinghouse will allow sharing of tools and resources. It will also make it easy to share success and failure stories to help all recipients strengthen their own programs.

While the main audience for this site is local government, both solid and hazardous waste and health department staff, the site will also be accessible to the public. Information will include:

- State Profile
- County and City Profiles
- Projects
- Outreach Materials
- Resources
- Calendar of Events

If you want to learn more about the Information Clearinghouse, provide feedback, or have questions, please contact Shannon McClelland, project coordinator, at (360) 407-6398 or smcc461@ecy.wa.gov.

Landfill and Incinerator Operator Certification Programs

Washington State law requires solid waste landfills and incinerators to have certified operators on site at all times (chapter 70.95D RCW, *Solid Waste Incinerator and Landfill Operators*). The Legislature created the Landfill and Incinerator Operator Certification program in 1989, through the "*Waste Not Washington Act.*" To carry out the law, the state

adopted a rule in June 1991 (*chapter 173-300 WAC, Certification of Operators of Solid Waste Incinerators and Landfill Facilities*).

The requirements for having certified operators on site at all times apply to the following types of facilities:

- Municipal solid waste landfills.
- Inert landfills.
- Limited purpose landfills.
- All incinerators that burn solid waste.

The law also requires that any person officially inspecting these solid waste facilities must be a certified operator.

In February 2004, Ecology reached an agreement with the Solid Waste Association of North America (SWANA) to conduct the training, testing, continuing education, re-certification, and program administration for landfill certification. SWANA will provide Ecology annually a list of currently certified persons. Ecology agreed to notify interested parties of upcoming training and testing. Ecology also agreed to notify all interested parties of SWANA's services under this new program structure.

The incinerator certification program continues to be Ecology's responsibility.

To date 575 people have been certified for landfill operations and 380 have been certified for incinerator operations.

Recognizing Waste Reduction and Recycling Efforts: Terry Husseman Sustainable School Awards


Mrs. Terry Husseman

The award program, open to all Washington state kindergarten through 12th grade public schools, recognizes them for successfully managing and using materials in a sustainable fashion. Schools are selected for the creative features of their programs, their purchasing practices, and their overall success at reducing waste and increasing recycling. The program rewards schools and teachers for developing innovative curriculums or operating longstanding programs. Additionally, schools that submit outstanding plans for future programs will receive seed money to assist with start-up costs.

There are three categories of awards:

- **Seed Award** assists schools with the costs of starting up programs. In 2006, twelve schools received awards ranging from $900 to $2,500.

- **Sustainable School Award** acknowledges schools with ongoing waste-reduction or recycling programs. In 2006, nine schools received awards ranging from $1,000 to $2,500 each.
- **Environmental Curriculum Award** encourages schools to develop curricula to teach environmental awareness in Washington schools. It should introduce students, teachers, staff, and administrators to the concepts of sustainability including its social, economic, and environmental relevance. In 2006, an award of $2,000 went to one school.

On May 19, 2006, at the State's Capitol Rotunda, Ecology Director Jay Manning and Solid Waste and Financial Assistance Program Manager Cullen Stephenson presented $30,000 in cash awards to 22 schools from across the state. About 100 schoolchildren attended and celebrated their schools' exceptional efforts to conserve resources, reduce waste, and preserve the environment. Award amounts ranged from $900 to $2,500.

Ecology's Litter Program Display

At the award ceremony guests, including Mrs. Terry Husseman, and other visitors to the rotunda enjoyed the educational displays and activities hosted by Ecology's Youth Corps, Litter Program, Composting Program, and the Hands on Children's Museum. After enjoying the organic refreshments, guests were able to contribute their leftovers to the Ecology composting bin.

Most of the schools that got awards were present for the celebration. Representatives Sam Hunt, Jim Dunn, and Larry Springer joined the festivities and each took a moment to say a few words to the audience about the importance of their efforts.

Hands on Children's Museum recycled art activity

Many schools practice environmental stewardship as they carry out beautification projects. School recycling programs often extend into the local communities. In several cases, the school program is the largest recycling effort the community has, and the reason why local citizens, businesses, and tribes are staying involved in the recycling effort.

Many of the programs are recycling efforts geared toward reducing schools' garbage by 50 percent or more. Several applicants added composting and green-purchasing plans to the more common recycling programs in their schools.

Some schools are helping their communities by creating recycling and compost centers, mapping shorelines and providing the maps to businesses and citizens, and planting useful wetland areas.

The award for creating an original curriculum goes to a program that takes an interdisciplinary approach to the study of sustainable communities. Math students study

resource consumption and social studies classes learn about public participation. Students use the three Washington State science standard strands of Inquiry, Systems, and Application as they discover the real life implications of solid waste.

Other awards help fledgling programs with start-up costs and some awards encourage established programs to continue operating. Table 2.4 identifies the 2005-2006 winners of the Terry Husseman Sustainable School Awards.

Table 2.4
2005-2006 Sustainable School Award Recipients

Seed Award	
JD Zellerbach Elementary, Clark County	$2,500
Canyon Creek/Cape Horn Skye, Skamania County	$1,900
Mt. Si High, King County	$1,700
Snoqualmie Elementary, King County	$1,700
Lincoln Middle, Whitman County	$1,500
Entiat/Paul Rumburg Elementary, Chelan County	$1,200
Hockinson High, Clark County	$1,000
Meridian High, Whatcom County	$1,000
WA State School for the Blind, Clark County	$1,000
Endeavour Intermediate, Pierce County	$900
Sustainable School Award	
Quilcene School, Jefferson County	$2,500
Cottage Lake Elementary, King County,	$1,500
Acme Elementary, Whatcom County	$1,000
Denny Middle, King County	$1,000
Harmony Elementary, Whatcom County	$1,000
Kendall Elementary, Whatcom County	$1,000
Mt. Baker Junior/Senior, Whatcom County	$1,000
Redmond High, King County	$1,000
West Valley High, Spokane County	$1,000
Creative Environmental Curriculum	
Komachin Middle School, Thurston County	$2,000

For more information, visit the Terry Husseman Sustainable Schools Awards site: http://www.ecy.wa.gov/programs/swfa/terryhusseman.html.

The Closed-Loop Scoop Newsletter

The Solid Waste and Financial Assistance Program (SW&FAP) publishes a quarterly newsletter called *The Closed-Loop Scoop*. This newsletter shares important information among public works departments, health districts, private recyclers, Ecology, and other clients and stakeholders. The editor encourages all interested parties to contribute articles that will help readers stay current on legislative matters, solid waste program successes and ideas, and upcoming meetings. More than 700 individuals and organizations across the state subscribe, with many parties opting to receive their copy electronically. *The Closed-Loop Scoop* is available on the Ecology SW&FAP Publications and Forms Web page, http://www.ecy.wa.gov/programs/swfa/nav/publication.html.

Recycling Information Line

The Solid Waste & Financial Assistance Program (SW&FAP) operates a toll-free information line to help citizens find ways to reduce waste and recycle. In 2006, staff helped almost 8,000 callers to 1-800-RECYCLE. While many callers simply want to know where and how to recycle common items (those taken by recycling centers and local curbside programs), others have questions of a more complex nature.

Staff can direct callers to alternatives to hazardous household products and locations for the safe disposal of household hazardous waste. Information on used oil recycling and used oil haulers is available. Locations for the recycling of construction, demolition, and landclearing debris are provided. The information line also lists companies that offer commercial pickup for business recycling. Targeted waste streams, such as electronic waste and items containing mercury, continue to offer the information line increased opportunities.

While many local governments operate information lines within their own areas, the statewide information line continues to serve as a first contact for many. Ecology's statewide information line can also provide callers with information on specialized recycling opportunities beyond their own city or county. Staff maintain the database by periodically contacting all recyclers to determine commodities handled, location (or areas served), and hours. Basic recycling information from the database is available at the information line's own web site: http://1800recycle.wa.gov. This web site also provides links to other on-line databases and exchanges, along with local government and recycling company web sites.

Other sections of the SW&FAP web site provide information on using recycled content building materials and sustainable building materials (http://www.ecy.wa.gov/programs/swfa/greenbuilding/) and information about solid waste facilities and disposal data http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

The 1-800-RECYCLE web site also includes a web page developed for kids of all ages. *Solid waste and recycling for kids* has clever links to other environmental education sites and fun environmental games to play. It also has interesting trivia facts on different recyclable materials. Check it out at http://www.ecy.wa.gov/programs/swfa/kidspage/.

Chapter III
Solid Waste Handling Infrastructure

(Note: The Solid Waste and Financial Assistance Program (SW&FAP) is developing a new data system to track facilities. At publication time, the system is not complete. Facility numbers are from 2005.)

This chapter describes the basic facilities that manage solid waste in Washington State. This chapter includes facilities that are regulated under the following:

Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills, which sets permitting, construction, and operating standards for municipal solid waste landfills in the state.

Chapter 173-306 WAC, Special Incinerator Ash Management Standards, which pertains to MSW incinerator ash monofills.

Chapter 173-350 WAC, Solid Waste Handling Standards, which went into effect in 2003. These standards replace the requirements of the *Minimum Functional Standards for Solid Waste Handling (MFS*), *chapter 173-304 WAC*, for the majority of other solid waste handling facilities.

Solid waste facilities that had permits in the past under the *MFS* now must either have permits under the requirements of chapter 173-350 WAC, *Solid Waste Handling Standards*, or must be closing under the requirements of the *MFS*. WAC 173-350-030(2) identifies the dates when these requirements take effect for existing solid waste facilities. Essentially the requirements for facilities existing at the time of the effective date of the regulation (February 2003) are:

- Within 24 months meet all applicable operating, environmental monitoring, closure and postclosure planning, and financial assurance requirements.
- Within 36 months meet all applicable performance and design requirements, other than location or setback requirements.
- Within 18 months begin the permit modification process in WAC 173-350-710(4)
- An existing facility completing closure within 12 months of the effective date shall close in compliance with the *MFS*. Any facility not completing closure within the 12 months shall close in compliance with chapter 173-350 WAC.

In Washington State, local jurisdictional health departments issue all but the permits for an ash monofill. Ecology is responsible for preparing the solid waste regulations and has a permit review function.

This chapter presents information about solid waste facilities as of September 2005. Table 3.1 identifies the regulations that apply for various solid waste facility types and compares them to the former types under chapter 173-304 WAC. The Table includes citations for the new

requirements under chapter 173-350 WAC or in some cases (such as woodwaste landfills) indicates that the particular facility type does not exist under the new regulation. There have been no changes to the municipal solid waste landfill or ash monofill requirements.

Table 3.1
Regulatory Requirements for Solid Waste Facilities

Facility types formerly found under *chapter 173-304 WAC*	**Where found under *chapter 173-350 WAC***
Municipal Solid Waste Landfills	Under chapter 173-351 WAC
Inert/Demolition Waste Landfills	Inert landfill only with very specific definitions of inert waste under 350-410. Demolition waste would be allowed for disposal in an MSW landfill or a Limited Purpose Landfill only
Limited Purpose Landfills	Limited Purpose Landfills are under 350-400
Woodwaste Landfills	No longer a landfill classification. Wood waste would be allowed for disposal in an MSW landfill or a Limited Purpose Landfill only
Composting Facilities	Under 350-220 (some are exempt from permitting)
Recycling Facilities	Either recycling facilities under 350-210 or material recovery facility (exempt from permitting) under 350-310
Recycling Facilities - Land Application	Land Application sites under 350-230
Landspreading Disposal Facilities	"Disposal" on land is no longer allowed. If beneficially used falls under 350-230
Energy Recovery and Incineration Facilities	Under 350-240
Compacting Stations	Under 350-310
Drop Boxes	Under 350-310
Transfer Stations	Under 350-310
Piles	Under 350-320
Surface Impoundments	Under 350-330, also tanks
Tire Piles	Under 350-350
Moderate Risk Waste Handling Facilities (under 304 they were permitted as intermediate handling facilities)	Under 350-360
Other	Under 350-490

For 2005, Ecology has identified 665 solid waste handling facilities in Table 3.2. In addition to permitted facilities, some facilities are exempt from permitting under *chapter 173-350 WAC, Solid Waste Handling Standards,* if they meet certain conditions.

Some recycling processors and intermediate recycling facilities are exempt, and Ecology included them in the facility count this year. In addition, some exempt composting facilities are also included. As facilities adjust to the new standards, and Ecology builds new data tracking systems, the numbers of facilities will be more accurate in the future.

Table 3.2
Facility Types Statewide

Facility Type	Statewide Total
Ash Monofill	1
Municipal Solid Waste Landfills	17
Inert Waste Landfills	29
Limited Purpose Landfills	10
Composting Facilities (permitted)	39
Composting Facilities (exempt)	3
Recycling Processors (exempt)	134
Intermediate Recycling Facilities (exempt)	128
Intermediate Recycling Facilities (permitted)	37
Land Application	18
Energy Recovery and Incineration Facilities	4
Drop Boxes	63
Transfer Stations	107
Piles	23
Surface Impoundments	0
Tire Piles	2
Moderate Risk Waste Handling Facilities	50
Total All Facilities	**665**

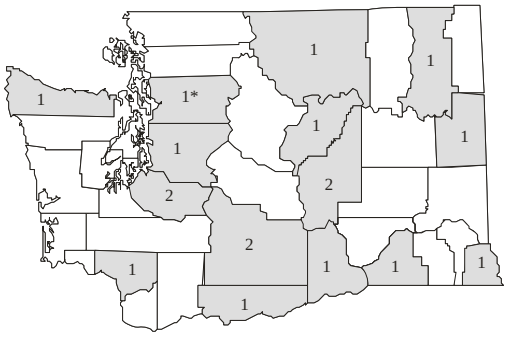
Table 3.3 identifies the facilities and the county in which they are located. Maps in this chapter identify the number of each facility type in each county.

Table 3.3
Solid Waste Facilities in Washington *(as of September 2005)*

County	MSW Landfill	Inert	Limited Purpose	Ash Monofill	Compost Facility	Drop Boxes	Pile Facility	Recycling Facility	Surface Impoundments	Land Application	Transfer Stations	Waste Tire Storage	Energy Recovery Incinerators	MRW Facilities
Adams								1		2	2			2
Asotin	1	1	1											1
Benton	1	2				2	2	11		1	4	1		1
Chelan		3			1			5			4			
Clallam	1		1		1			4			2			
Clark			2		2		1	7			2			3
Columbia					1					1	1			1
Cowlitz	1		1		1	1		3			1			1
Douglas	1	1	1					3		1	1			
Ferry								1			1			
Franklin								7		1	1			1
Garfield											1			
Grant	2				1	15		8		3	1			
Grays Harbor		1	1				1	6		3	6			1
Island					1			5			5			4
Jefferson		1	1		2	1		5			1			1
King	1		1		4	2		45			14			5
Kitsap					1	6		5			1			1
Kittitas		1						4			2			2
Klickitat	1			1		2		1			3	1		4
Lewis			1		1	8		3		3	3			1
Lincoln										1	1			1
Mason			1		2	3		14			1			1
Okanogan	1							3			2			1
Pacific								1			2			1

County	MSW Landfill	Inert	Limited Purpose	Ash Monofill	Compost Facility	Drop Boxes	Pile Facility	Recycling Facility	Surface Impoundments	Land Application	Transfer Stations	Waste Tire Storage	Energy Recovery Incinerators	MRW Faciliites
Pend Oreille											3		1	1
Pierce	2	3			4	1	13	38			14		1	1
San Juan						1		1			2			1
Skagit		1			5			8			3			1
Skamania								1			3			
Snohomish		1			5	6		22			5			1
Spokane	1	6	2		1		1	35		1	5		2	3
Stevens	1		1				1	2			4			1
Thurston					2	3		9			1			1
Wahkiakum						1		1						
Walla Walla	1	1			3		1	3						1
Whatcom		1	1		2	6	1	22			4			2
Whitman		4	1		1			3			1			1
Yakima	2	2	2		1	5	2	12		1				3
Total	**18***	**29**	**10**	**1**	**42**	**63**	**23**	**299**	**0**	**18**	**107**	**2**	**4**	**50**

Municipal Solid Waste Landfills



Requirements for municipal solid waste (MSW) landfills are found in chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills.* These requirements have not changed.

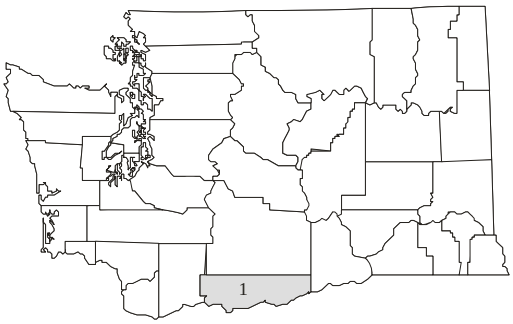
In 2005, 16 operating MSW landfills accepted 5,577,342 tons of waste. (See Chapter V for additional discussion of waste types, amounts and sources.)

In 2006, public entities operated, the majority, 81 percent, of the remaining 16 operating landfills. This has historically been true in Washington. However, while privately owned landfills comprise only 19 percent of this type of facility, they have about 93 percent of the remaining capacity.

Location and Number of MSW Landfills

Asotin – 1	Grant – 2	Spokane – 1
Benton – 1	King – 1	Stevens – 1
Clallam – 1	Klickitat – 1	Walla Walla – 1
Cowlitz - 1	Okanogan – 1	Yakima – 2
Douglas – 1	Pierce – 2	

Ash Monofills



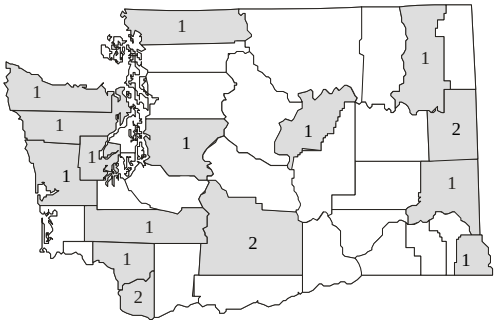
Ash monofills are landfill units that receive ash residue from municipal solid waste incinerator/energy-recovery facilities. The *Incinerator Ash Reside Act*, chapter 70.138 RCW, gave direct permitting authority to Ecology, as well as giving it the authority to develop rules to regulate the disposal of this ash. Under chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, incinerators that burn more than 12 tons a day of municipal solid waste must have a Generator (Ash) Management Plan, approved by Ecology, in place prior to operation of a facility. The ash management plan identifies the location of the ash monofill the incinerator will use for ash disposal.

In 2005, there was only one permitted ash monofill in Washington, located at the Roosevelt Regional Landfill in Klickitat County. The monofill operates under a permit issued by Ecology, and received 80,842 tons of special incinerator ash in 2005.

Location and Number of Ash Monofills

Klickitat - 1

Limited Purpose Landfills



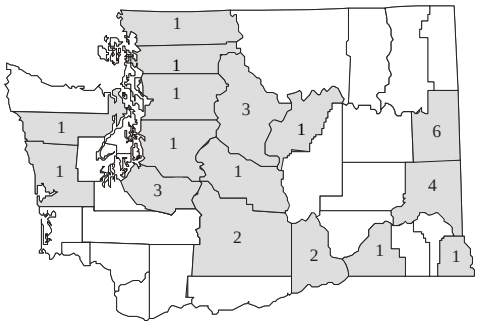
Limited purpose landfills previously regulated under the *MFS*, are now regulated under *WAC 173-350-400, Limited Purpose Landfills*. This rule defines a limited purpose landfill as a landfill that no other state or federal environmental regulations apply to and that receives solid wastes limited by type or source. Requirements for these types of landfills now include additional design, ground water monitoring, and financial assurance standards.

In 2005, limited purpose landfills reported receiving 1,387,934 tons of waste.

Location and Number of Limited Purpose Landfills

Asotin – 1	Grays Harbor – 1	Spokane – 2
Clallam – 1	Jefferson – 1	Stevens – 1
Clark – 2	King – 1	Whatcom – 1
Cowlitz – 1	Lewis – 1	Whitman – 1
Douglas – 1	Mason – 1	Yakima – 2

Inert Waste Landfills



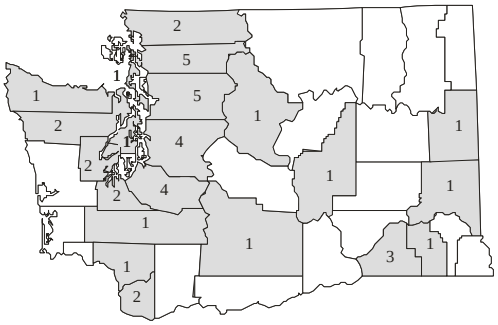
A combined inert/demolition waste landfill, which was previously regulated under the *MFS*, is now broken out under two different portions of the *Solid Waste Handling Standards*. A landfill that takes demolition waste will now need to meet the requirements of *WAC 173-350-400, Limited Purpose Landfills*. A landfill that takes inert materials, as identified in*WAC 173-350-990, Criteria for Inert Waste*, will need to meet the requirements of *WAC 173-350-410, Inert Waste Landfills*.

In 2005, inert landfills reported receiving 1,531,641 tons of waste. In 2005, there were 33 inert/demolition landfills listed in the state.

Location and Number of Inert Waste Landfills

Asotin – 1	King – 1	Spokane – 6
Benton – 2	Kittitas – 1	Walla Walla - 1
Chelan – 3	Pierce – 3	Whatcom – 1
Douglas – 1	Skagit – 1	Whitman – 4
Grays Harbor – 1	Snohomish – 1	Yakima – 2
Jefferson – 1		

Composting Facilities



Composting facilities were previously permitted under the *MFS* as either a Pile or a Recycling Facility. Composting facilities will now need to meet the requirements of *WAC 173-350-220, Composting Facilities*. This section of the rule

does allow for some specific exemptions from permitting (WAC 173-350-220(1)(b)). Permitted facilities have additional design, operational, and compost quality testing requirements.

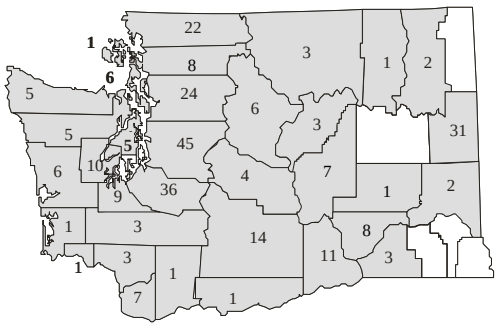
In 2005, composting facilities reported producing a total of 769,144 tons of composted material. In 2005, Ecology identified 39 permitted composting facilities and three exempt facilities statewide.

Location and Number of Composting Facilities

Chelan – 1	Jefferson – 2	Snohomish – 5
Clallam – 1	King – 4	Spokane – 1
Clark – 2	Kitsap – 1	Thurston – 2
Columbia – 1	Lewis – 1	Walla Walla – 3
Cowlitz – 1	Mason – 2	Whatcom – 2
Grant – 1	Pierce – 4	Whitman – 1
Island – 1	Skagit – 5	Yakima – 1

Recycling Facilities

In the past, the recycling facility requirements under the *MFS* covered land application and composting. These two facility activities fall under their own sections of the *Solid Waste Handling Standards*.



Recycling as defined in *WAC 173-350-100, Definitions*, means "transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill disposal or incineration. Recycling does not include collection, compacting, repackaging, and sorting for the purpose of transport." Facilities meeting this definition and also meeting the terms and conditions of *WAC 173-350-210(2) Permit Exemption and Notification*, are exempt from solid waste permitting.

There are several activities which in the past may have been considered "recycling" that are not included under this exemption and require a permit under other sections of the *Solid Waste Handling Standards*. *WAC 173-350-210(1) Recycling – Applicability* states that "these standards apply to recycling solid waste. These standards do not apply to:

(a) Storage, treatment or recycling of solid waste in piles which are subject to WAC 173-350-320.

(b) Storage or recycling of solid waste in surface impoundments which are subject to WAC 173-350-330.

(c) Composting facilities subject to WAC 173-350-220.

(d) Solid waste that is beneficially used on the land that is subject to WAC 173-350-230.

(e) Storage of waste tires prior to recycling which is subject to WAC 173-350-350.

(f) Storage of moderate risk waste prior to recycling which is subject to WAC 173-350-360.

(g) Energy recovery or incineration of solid waste which is subject to WAC 173-350-240.

(h) Intermediate solid waste handling facilities subject to WAC 173-350-310."

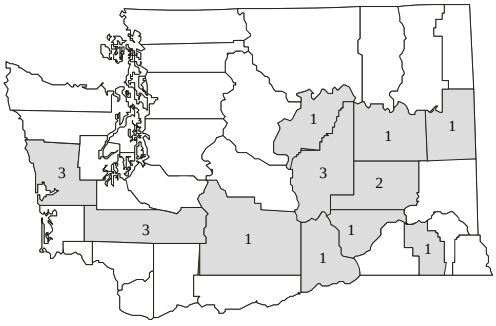
In 2005, Ecology identified 134 exempt recycling processors, 128 exempt intermediate recycling facilities, and 37 permitted intermediate recycling facilities.

Location and Number of Recycling Facilities

Adams – 1	Jefferson – 5	Skamania – 1
Benton – 11	King – 45	Skagit – 8
Chelan – 6	Kitsap – 5	Snohomish – 24
Clallam – 5	Kittitas – 4	Spokane – 31
Clark – 7	Klickitat – 1	Stevens – 2
Cowlitz – 3	Lewis – 3	Thurston – 9
Douglas – 3	Mason – 10	Wahkiakum – 1
Ferry – 1	Okanogan – 3	Walla Walla – 3
Franklin – 8	Pacific – 1	Whatcom – 22
Grant – 7	Pierce – 36	Whitman – 2
Grays Harbor – 6	San Juan – 1	Yakima – 14
Island – 6		

Land Application

Under the *MFS*, use of solid waste on the land (land application) was permitted as a recycling facility. Currently, *WAC 173-350-230 Land Application* requires a permit for beneficially using solid waste for its agronomic value on the land, or soil-amending capability, including land reclamation, unless the waste meets one of the exemption criteria of *WAC 173-350-230(1) Land Application – Applicability*.



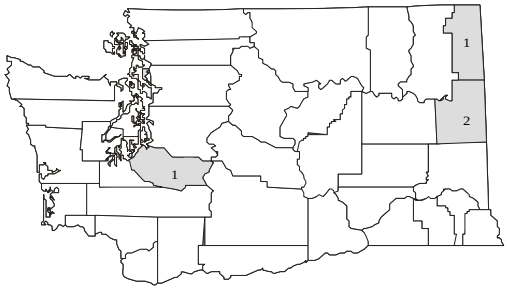
In 2005, Ecology identified 18 land application sites.

Location and Number of Land Applications

Adams – 2	Franklin – 1	Lincoln – 1
Benton – 1	Grant – 3	Spokane – 1

Columbia – 1	Grays Harbor – 3	Yakima – 1
Douglas – 1	Lewis – 3	

Energy Recovery and Incineration Facilities



Energy recovery and incineration facilities designed to burn more than twelve tons of solid waste per-day was permitted under the *MFS*. These facilities are now permitted under *WAC 173-350-240, Energy Recovery and Incineration Facilities*. The requirements remain essentially unchanged.

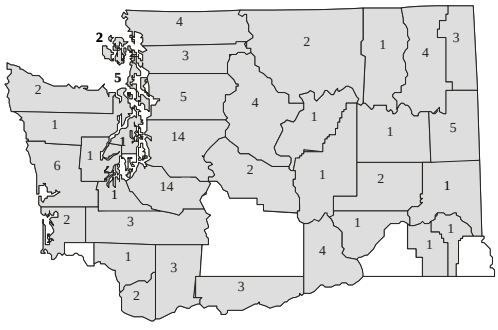
In addition to the solid waste handling permit, solid waste incinerators may be subject to regulations under *chapter 70.138 RCW, the Incinerator Ash Residue Act*. The rule carrying out this act, *chapter 173-306 WAC, Special Incinerator Ash Management Standards*, requires certain solid waste incinerators to prepare generator (ash) management plans. The rule does not apply to incineration or energy recovery facilities that burn only tires, wood waste, infectious waste, sewage sludge, or any other single type of refuse other than municipal solid waste. It also does not apply to facilities that burn less than 12 tons of municipal solid waste a day.

In 2005, Ecology identified four energy recovery or incineration facilities statewide. They reported 335,533 tons of waste incinerated in 2005. Of the four permitted facilities, only the Spokane Regional Waste-to-Energy Facility is subject to the requirements of *chapter 173-350 WAC* and *chapter 173-306 WAC*. This facility must have a generator ash management plan, approved by Ecology, which addresses the handling, storage, transportation, and disposal of incinerator ash. The ash is currently disposed of in the ash monofill at Roosevelt Regional Landfill. At this time the City of Tacoma Steam Plant is inactive.

Location and Number of Energy Recovery and Incineration Facilities

Pend Oreille – 1	Pierce – 1	Spokane - 2

Intermediate Solid Waste Handling Facilities



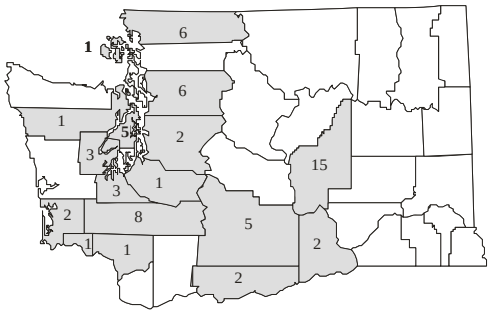
Transfer stations, drop boxes, and baling and compaction sites were permitted under the *MFS*. Material recovery facilities were permitted as recycling facilities under the *MFS*. These facilities are now all permitted under *WAC 173-350-310 Intermediate Solid Waste Handling Facilities*. Some material recovery facilities may be exempt from permitting if they meet the requirements of *WAC 173-350-310(2) Materials Recovery Facilities-Permit Exemption and Notification.*

In 2005, Ecology identified 107 transfer stations statewide.

Location and Number of Transfer Stations

Adams – 2	Grays Harbor – 6	Pend Oreille – 3
Benton – 4	Island – 5	Pierce – 14
Chelan – 4	Jefferson – 1	San Juan – 2
Clallam – 2	King – 14	Skagit – 3
Clark – 2	Kitsap – 1	Skamania – 3
Columbia – 1	Kittitas – 2	Snohomish – 5
Cowlitz – 1	Klickitat – 3	Spokane – 5
Douglas – 1	Lewis – 3	Stevens – 4
Ferry – 1	Lincoln – 1	Thurston – 1
Franklin – 1	Mason – 1	Whatcom – 4
Garfield – 1	Okanogan – 2	Whitman – 1
Grant – 1	Pacific – 2	

In 2005, Ecology identified 63 drop boxes statewide.



Location and Number of Drop Boxes

Benton – 2	Lewis – 8	Snohomish – 6
Cowlitz – 1	Mason – 3	Thurston – 3
Grant – 15	Pacific – 2	Wahkiakum – 1
King – 2	Pierce – 1	Whatcom – 6
Kitsap – 5	San Juan – 1	Yakima – 5
Klickitat – 2		

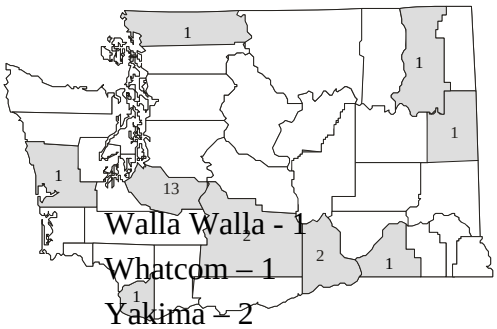
In 2004, Ecology identified no separately permitted baling stations statewide. It did identify three publicly owned compacting facilities.

Piles Used for Storage or Treatment

Piles used for storage or treatment under the *MFS* included composting and contaminated soils treatment piles, as well as tire piles with more than 800 tires at one facility. Composting is now addressed under *WAC 173-350-220 Composting Facilities*; waste tire storage sites

with more than 800 tires are addressed under *WAC 173-350-350 Waste Tire Storage and Transportation*. Standards for other types of solid waste piles are found in *WAC 173-350-320 Piles Used for Storage or Treatment*.

In 2005, Ecology identified 27 regulated piles (not including composting or tires) statewide.

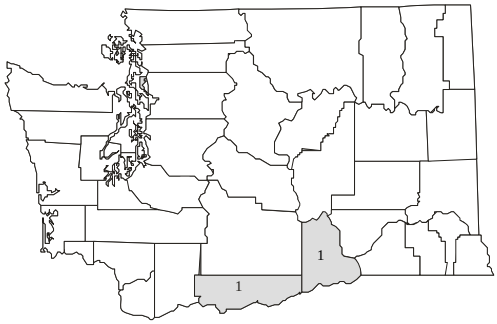


Location and Number of Piles

Benton – 2	Pierce – 13	Walla Walla - 1
Clark – 1	Spokane – 1	Whatcom – 1
Grays Harbor – 1	Stevens – 1	Yakima – 2

Waste Tire Storage and Transportation

Under the *MFS*, waste tire storage facilities with more than 800 tires were regulated under Piles. Waste tire storage facilities of more than 800 tires are now regulated under *WAC 173-350-350 Waste Tire Storage and Transportation*. A significant change in the regulation is the requirement of financial assurance for the waste tire storage site (*WAC 173-350-350(9) Waste Tire Storage and Transportation – Financial Assurance Requirements*).



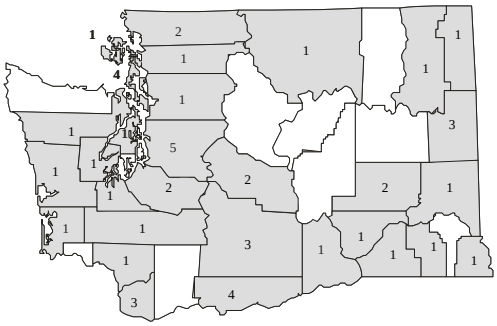
In 2005, Ecology identified two privately owned permitted tire piles.

Location and Number of Permitted Waste Tire Storage Facilities

Benton – 1 Klickitat – 1

Moderate Risk Waste Handling

Moderate risk waste (MRW) facilities were not directly included in the *MFS*: however, the *Moderate Risk Waste Fixed Facility Guidelines* developed by Ecology provided guidance on which aspects of the MFS should be used in the permitting of these interim handling facilities. Now MRW facilities are regulated under *WAC 173-350-360 Moderate Risk Waste Handling*. This section of the regulation also addresses mobile systems and collection events, limited MRW facilities, and product take-back centers.



The new rule includes two significant additions. First are the requirements for flammable gas monitoring and exhaust ventilation at some facilities. The second addresses financial assurance for the fixed moderate risk waste facilities that store more than 900 gallons of MRW on-site, excluding used oil *(WAC 173-350-360(9) Moderate Risk Waste Facilities – Financial Assurance Requirements).*

In 2005, Ecology identified 50 fixed moderate risk waste facilities statewide (See Chapter VII. Moderate Risk Waste Collection System for details on types and amounts of materials collected in 2004.).

Location and Number of MRW Sites

Adams - 2	King – 5	San Juan – 1
Asotin - 1	Kitsap – 1	Skagit – 1
Benton – 1	Kittitas – 2	Snohomish – 1
Clark – 3	Klickitat – 4	Spokane – 3
Columbia - 1	Lewis – 1	Stevens – 1
Cowlitz – 1	Mason – 1	Thurston – 1
Franklin – 1	Okanogan – 1	Walla Walla – 1
Grays Harbor – 1	Pacific – 1	Whatcom – 2
Island – 4	Pend Oreille – 1	Whitman – 1
Jefferson – 1	Pierce – 2	Yakima – 3

Chapter IV
Statewide Litter Prevention & Cleanup Programs

Chapter 70.93 RCW, the Waste Reduction, Recycling, and Model Litter Control Act, makes Ecology the lead in managing statewide litter programs. Work in 2006, focused on evaluating the first years of the "litter and it will hurt" campaign and planning future campaign activities. The Solid Waste & Financial Assistance Program (SW&FAP) carries out the following core elements of the statewide litter program:

- Helping with communication and coordination of litter control and prevention activities.
- Carrying out the litter prevention campaign.
- Conducting periodic statewide litter surveys.
- Managing allocations from the Litter Account.
- Sending out the Ecology Youth Corps (EYC).
- Managing the Community Litter Cleanup Program (CLCP).
- Strengthening partnerships with other state agencies and local governments.

Litter Prevention Campaign

The "litter and it will hurt" campaign is the statewide social marketing campaign aimed at reducing litter on Washington roadways. The campaign has used multiple strategies over several years to raise awareness, alter beliefs, and ultimately change behaviors about litter. Key elements of the campaign include:

- Television, radio, and outdoor (billboard) media.
- A litter hotline.
- A roadway signage program.
- A Web site.
- Distribution of litterbags and campaign materials.
- An enforcement plan.

Ecology based the "litter and it will hurt" campaign on research conducted in 1999 and 2001. This research indicated strong messages about littering fines and penalties would be the most effective deterrent to litter. The "litter and it will hurt" slogan premiered in 2002, along with information on fines for littering and facts about the litter problem. All this served to raise public awareness about litter.

The original campaign plan provided Ecology with a three-year strategy to carry out the campaign. This period concluded at the end of 2004. With limited funding available, Ecology decided to significantly reduce campaign activity in 2005. Instead, Ecology spent time promoting a "secure your load" video and brochure, and working with the law enforcement community on this important safety issue. In 2006, Ecology completed a thorough campaign evaluation and with a consultant team, drafted a new three-year campaign plan.

Campaign Evaluation

Before continuing the "litter and it will hurt" campaign, Ecology decided it would be practical to evaluate past campaign efforts as part of a re-planning effort. Ongoing measures include quantifying the amount of litter generated in the state and tracking awareness of the campaign and its messages. But the evaluation conducted in 2006 was much more thorough, and included:

- Review of 1999 and 2004 litter surveys.
- Analysis of campaign awareness tracking 2002-2006.
- Peer (other state) and local government surveys.
- Review of how effectively media dollars were spent.
- Examination of the litter hotline program.
- Evaluation of the partnership and sponsor programs.

A discussion of the key findings follows.

Litter Surveys

Litter surveys are conducted every five years to determine the composition and amount of litter deposited on Washington roadways. Between 1999 and 2004, there was an observed decline in the annual amount of litter deposited on Washington roadways. The estimated amount of litter decreased from 8,322 tons in 1999 to 6,315 tons in 2004, a 24 percent decline. The "litter and it will hurt" campaign was implemented in 2002, and even though it is too early to declare a trend, the litter survey results indicate that the State's programs are on the right track.[8]

Campaign Awareness Tracking

Beginning in 2002, Ecology tracked awareness of various elements of the "litter and it will hurt" campaign through a telephone survey of Washington residents conducted by Survey USA and Belo Northwest Marketing Solutions. Typically, the polling was conducted three times during the year before, during, and after advertising flights. No surveys were conducted in 2005, but a new benchmark was conducted in April 2006. In general, awareness of the campaign slogan, fines for littering, and the litter hotline number have increased dramatically. However, the belief in the likelihood of getting caught and fined has remained stagnant. This

[8] A complete litter survey report can be found at http://www.ecy.wa.gov/biblio/0507029.html

indicates that Ecology needs to continue to work with the law enforcement community to change this perception.

Peer Review and Local Government Surveys

An on-line survey was sent to 49 other states to gain insight on their programs. A total of 27 respondents representing 24 states completed the survey. One finding was that while Washington's campaign uses enforcement-themed messages, "take pride" messages dominate other state campaigns. It is interesting to note that "take pride" messages failed to resonate with litterers in Washington's focus group research. Washington's program is unique in other ways as well, emerging as a national leader in litter prevention efforts. While many states track the quantity of litter that is picked up, it appears that Washington is one of the only states in the nation that continuously tracks both campaign awareness and the amount of litter on state roadways.

An on-line survey was also sent to 93 individuals at local government agencies to gain insight on what they believed worked well or could have been improved with the "litter and it will hurt" program.9 A total of 62 respondents completed the survey. Overall, local government stakeholders are very supportive of the "litter and it will hurt" campaign and feel it has been effective at raising awareness and reducing litter. In the future, local stakeholders would be interested in exploring school programs, more enforcement efforts and signage programs. All of these ideas will be considered as campaign implementation continues.

Media Dollars Review

As part of the evaluation, the media mix (television, radio, outdoor), broadcast selection (how many networks), and scheduling was reviewed to determine where media dollars were most effective. Media partners used over the course of the campaign have been supportive. Bonus schedules and merchandising allowances negotiated with the stations allowed Ecology to triple the value and impact of advertising that ran in 2003 and 2004 over 2002 (as measured by cost per impression). We learned that shorter spots shown with greater frequency during a set time period, concentrated on selected networks, was the most effective use of limited media dollars. We also learned that use of outdoor (billboards) media adds significantly to campaign impressions and ensures the message is delivered at "the scene of the crime."

Litter Hotline Program

The litter hotline is a toll-free phone line (866-LITTER-1) available to people to report littering incidents they witness, such as a person throwing something out the window of a vehicle or an item falling from an unsecured load. The state Department of Ecology operates the litter hotline in cooperation with the Washington State Patrol and the Washington State Department of Licensing. The call information is used to cross-reference the license plate number and car description with information in the Department of Licensing vehicle-registration system. If the plate and description match, the listed registered owner of the

[9] A handful of state agency representatives who have participated in campaign activities were also included.

vehicle is sent a letter from the Washington State Patrol, notifying them of details of the incident and the fines for littering.

As a way to evaluate the effectiveness of the litter hotline program, a postcard survey has been enclosed in every hotline letter since June 2005. The survey asks seven simple questions to get at whether or not the hotline letter changed respondent's awareness and beliefs about litter, whether or not they will litter again, and their perceptions about the hotline program. As of March 2006, 683 postcard surveys had been returned (an 8-10 percent return rate). Respondents to the postcard survey, people who actually received a hotline letter, consistently answer questions differently than the general public. Based on these responses, it appears the litter hotline program is very effective at raising awareness, altering beliefs and ultimately changing behavior.

Key findings include:

- 77 percent of respondents perceive litter fines to be somewhat or very severe (versus 57 percent of the general public).
- 68 percent believe they are likely or somewhat likely to get caught and fined (versus 30 percent of the general public).
- 78 percent think the litter hotline program is effective (versus 51 percent of the general public).
- 92 percent say they are not likely to litter again.

The combination of the litter hotline letter (on State Patrol letterhead) and the enclosed litterbag brings home the message about needing to prevent litter in Washington.

Partnership and Sponsor Program

Private sponsorships significantly extended the exposure of the "litter and it will hurt" campaign, but gaining these sponsorships was extremely time-intensive and somewhat difficult. In the future, efforts to gain sponsors should focus on in-kind contributions and use of existing communication avenues to reach businesses' employees and customers.

Involvement and cooperation with other state agencies, particularly Washington State Patrol will be key to the continued success of the campaign. In April 2006, Ecology worked with Washington State Patrol and King County Sheriff's Office to conduct a two-week targeted enforcement patrol around secured loads. This was the second "pilot" of enforcement emphasis patrols modeled after the "Click it or Ticket" campaign. These enforcement patrols seem to be the best way to get tickets written and get media attention, furthering the campaign's objectives.

In Summary

The campaign evaluation indicated the "litter and it will hurt" campaign is working to raise awareness. Ecology is doing a good job accounting for campaign expenditures and evaluating various strategies. It also appears Washington is emerging as a national leader in litter

prevention programs. While research indicated that fines and enforcement are key deterrents to littering, more needs to be done to make people "believe" they will be caught and fined in order to substantially impact their littering behaviors. As the campaign moves forward, new emphasis will be placed on promoting the litter hotline and working with the law enforcement community.

Litter Program Fund Allocation

Significant portions of the Waste Reduction, Recycling and Model Litter Control Account (WRRMLCA) support a variety of programs to cleanup litter and illegal dump sites on public roads and lands. The legislation (Chapter 70.93 RCW) directs fund allocation as follows:

- 20 percent to run the Community Litter Cleanup Program (CLCP).
- 30 percent to fund waste reduction and recycling efforts within Ecology.
- 50 percent to fund litter clean-up efforts.

Besides providing monies for the Ecology Youth Corps (EYC), the 50 percent dedicated to clean-up efforts also pays for litter activities carried out by other state agencies. Funding for the litter prevention campaign comes from the fifty percent as well.

For the current biennium (July 2005 – June 2007), the appropriation from the WRRMLCA was $13.88 million divided as follows:

Community Litter Cleanup Program (20%)	$2.9 million
Waste Reduction & Recycling Activities (30%)	$4.4 million
Litter Cleanup & Prevention (50%)	$6.5 million
TOTAL	**$13.8 million**

The $6.5 million dedicated to clean-up efforts and prevention was allocated as follows:

Operation of Ecology Youth Corps	$2.64 million
Other state agencies	$1.06 million
Prevention campaign	$1.03 million
Agency overhead	$0.36 million
Administration & coordination (staff)	$1.45 million
TOTAL	**$6.54 million**

Ecology Youth Corps

2005 marked the 30th year of operation for the Ecology Youth Corps (EYC). The Ecology Youth Corps[10] web site contains regional hiring information, applications, and photos of the EYC in action.

[10] http://www.ecy.wa.gov/programs/swfa/eyc/index.html

Background

RCW 70.93.020 requires creation of "jobs for employment of youth in litter cleanup and related activities." The EYC operates two types of crews, youth crews and median crews. Youth crews operate in the summer months (June - August) and comprise the largest portion of EYC activities. Most median crew activity occurs in the spring and fall, with reduced median crew activity in the summer.

Youth crews consist of 14 - 17 year old youths. They mostly clean shoulder areas and interchanges of major state routes and interstates. Additional work occurs on county roads, state and county parks, recreational lands, and other public areas. Over 2,000 youths from across the state apply annually for approximately 300 positions. Youth crews work two four-week summer sessions with a complete turnover of crews occurring mid-summer.

Median crews are composed of young adults 18 years and older. They clean challenging areas of roadways, including medians, complex ramps and interchanges, and exceptionally high-traffic areas.

In 2005, EYC crews collected litter on roadways and public land in the following counties:

Central Region (CRO):
Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, and Yakima.

Eastern Region (ERO):
Adams, Asotin, Ferry, Franklin, Columbia, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman.

Northwest Region (NWRO):
Island, King, Kitsap, Skagit, Snohomish, and Whatcom.

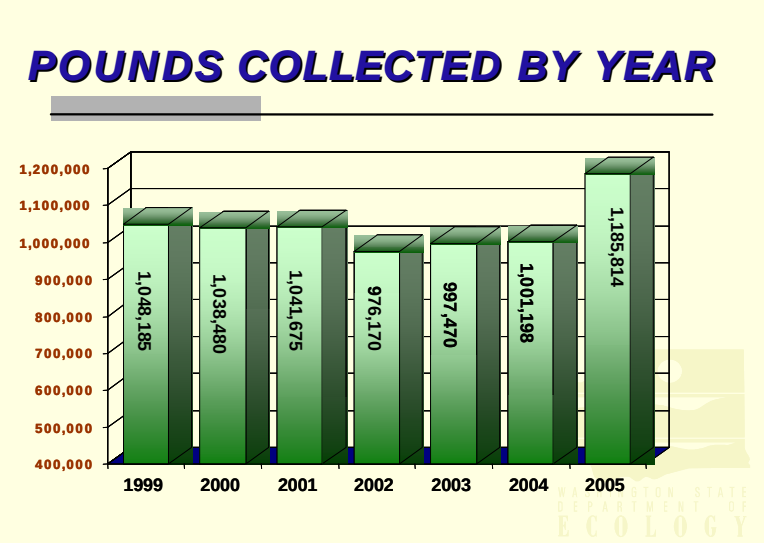
Southwest Region (SWRO):
Clark, Cowlitz, Grays Harbor, Lewis, Mason, Pacific, Pierce, and Thurston.

The EYC also ensures that youth learn about the broader issues of waste reduction, recycling, litter control, composting and other ecological concerns, such as global warming, air and water quality, salmon recovery, and the principles of sustainability. Crews may take field trips to a landfill, a wastewater treatment plant, an estuary, a water source in a specific watershed, a "green building", or a local organic farm as part of their work experience. Table 4.1 summarizes EYC work for 2005 and Figure 4.1 shows the amount of litter the EYC has picked up over that last seven years.

Table 4.1
Ecology Youth Corps Program Outputs
January 1 – December 31, 2005

Total Hours Worked (Supervisor + Crew)	79,830
Total Pounds Collected (Litter + Illegal Dump + Recycled)	1,195,040
Miles	5,615
Acres	617
Number of Illegal Dumps Cleaned	99

Figure 4.1



Ecology continues to operate the Ecology Youth Corps in partnership with the Washington State Department of Transportation (WSDOT), with WSDOT carrying the crew supervisor FTEs, and Ecology managing all other aspects of the program. The interagency agreement between Ecology and WSDOT, specifies that Ecology retain responsibility for funding, program oversight, and implementation, while WSDOT is technically the EYC supervisors' employer.

Community Litter Cleanup Program

In 1998, Ecology created the Community Litter Cleanup Program (CLCP) to help local governments deal with the growing problems of litter and illegal dumps on roadways and other public land. Now on a two-year schedule (or cycle), the CLCP continues to be a key element of statewide litter-cleanup programs, responsible for over half of all miles cleaned and pounds collected with Ecology funding.

Most local governments use jail or community-service crews to do litter cleanup work. The use of these crews provides significant savings to local jails and returns labor value to the communities taking part. Several jurisdictions also use volunteer groups to assist in cleanup and or educational efforts.

In the current cycle (July 2005 – June 2007), funds were again awarded based on a three-part formula:

- 40 percent base (to ensure minimum funding for a basic program in all jurisdictions).
- 37.5 percent geographic and demographic factors (area, population, miles of roads, and miles driven).
- 22.5 percent additional needs criteria, also known as efficiency and effectiveness.

This three-part funding formula, put into practice last biennium, has significantly reduced under-use of funds and directed monies to the areas with the biggest litter problems. In the

first year of the current cycle, allocations and spending are tracking very closely, an encouraging sign after years of under-using of funds. The funding formula percentages will remain the same for the next cycle.

In the current cycle Ecology awarded $2.91 million to 41 entities, with all eligible jurisdictions participating. The $2.91 million includes $180,000 that in previous biennia went directly to Department of Corrections (DOC). In two jurisdictions (City of Seattle and Kittitas County), money that previously went to DOC was incorporated into the CLCP contract to create efficiencies. $280,000 of the total CLCP allocation was used to purchase capital inventory (typically vans, trucks, or trailers), as part of the Tools & Trucks program. Since 1998 Ecology has distributed more than $1,000,000 through the Tools & Trucks program. Table 4.2 highlights the work accomplished during 2005.

Table 4.2
Community Litter Cleanup Program Outputs
January 1 – December 31, 2005

Total Hours Worked (Supervisor + Crew)	185,017
Total Pounds Collected (Litter + Illegal Dump + Recycled)	3,786,671
Miles	22,248
Acres	5,513
Number of Illegal Dumps Cleaned	4,031

Litter Cleanup by Other State Agencies

The state agency litter work group continues to meet once or twice a year to review activities, improve coordination, and discuss future funding. In the past, the work group was made up of representatives from the departments of Corrections, Natural Resources, Transportation, the Parks and Recreation Commission, and Ecology. In 2005, the Department of Fish and Wildlife also became a member.

Using a consensus process, the workgroup negotiates the amount each agency receives through interagency agreements to fund litter and illegal dump activities. The budget for the current biennium is listed in Table 4.3 below.

Table 4.3
Interagency Agreements between Ecology and Other State Agencies for Litter Activities
July 1, 2005 – June 30, 2007

Agency	05-07 Biennium
Department of Natural Resources	$ 455,000
Department of Corrections	$ 450,000
Department of Transportation	$ 80,000
Parks & Recreation Commission	$ 50,000
Department of Fish & Wildlife	$ 25,000
TOTAL	**$1,060,000**

Parks and Recreation Commission

The Parks and Recreation Commission (Parks) traditionally uses litter funds for waste reduction and recycling efforts as well as litter and illegal dump cleanup. Most litter collection is done by park rangers, park users, and volunteers. Table 4.4 shows how the $50,000 was allocated under the current agreement between Ecology and Parks. A complete accounting of what was accomplished will be available at the end of the biennium (fall 2007). For information on Parks past accomplishments, please go to the "Parks" section on the litter website.[11]

Table 4.4
Parks Projects Using Litter Funds
July 1, 2005 – June 30, 2007

Items	Brief Description	Amount
Clean-up & Disposal	Identify illegal dumps in state parks and prioritize for cleanup. Schedule routine litter cleanups in various parks following major public events.	$ 26,000
Recycling Projects	Continue to purchase recycling containers and signage to increase recycling opportunities for visitors and staff.	$ 14,000
Volunteer Program	Purchase of supplies for parks volunteers statewide.	$ 5,000
Pet Waste Program	Purchase of bags and dispensers in support of the pet waste disposal program at parks.	$ 4,000
Composting Projects	Continue to purchase compost equipment and signage to increase composting opportunities for visitors and staff.	$ 1,000
	TOTAL	**$ 50,000**

[11] http://www.ecy.wa.gov/programs/swfa/litter/who.html#a7

Department of Corrections

The Department of Corrections (DOC) receives funding through Ecology to run community based correctional litter crews on state roads, on state lands, and in local communities. The current interagency agreement with DOC provides $270,000 to crews in Wenatchee, Spokane, Tri-Cities, Walla Walla, and Yakima. The remaining $180,000 of DOC's allocation was distributed as part of the Community Litter Cleanup Program to crews in Seattle and Ellensburg. For more information please refer to the "Community Litter Cleanup Program" section of this report. Table 4.5 summarizes activity of DOC crews covered by interagency agreement for 2005 (Seattle and Ellensburg activity is reported with CLCP data in the CLCP section of this report).

Table 4.5
Department of Corrections Litter Removal Activity
January 1 – December 31, 2005

Total Hours Worked (Supervisor + Crew)	30,921
Total Pounds Collected (Litter + Illegal Dump + Recycled)	389,525
Miles	1,577
Acres	1,070
Number of Illegal Dumps Cleaned	5

Department of Natural Resources

The Department of Natural Resources Camps Program, in partnership with Department of Corrections, puts offender crews to work on state lands. As illustrated by the data in Table 4.6, this program has considerable impact on the cleanup of litter and illegally dumped materials in state-owned forests.

The current interagency agreement between Ecology and Department of Natural Resources (DNR) provides $400,000 for part-time crews at the following camps: Naselle, Larch, Cedar Creek, Monroe, Olympic, Airway Heights and Mission Creek. An additional $55,000 was devoted to contracted and volunteer crew activities.

Table 4.6
Department of Natural Resources Litter Removal Activity
January 1 – December 31, 2005

Total Hours Worked (Supervisor + Crew)	26,317
Total Pounds Collected (Litter + Illegal Dump + Recycled)	543,423
Miles	972
Acres	95
Number of Illegal Dumps Cleaned	517

Department of Transportation

The Department of Transportation (WSDOT) is responsible for picking up litter along state roads, including the bags of litter collected by Adopt-a-Highway groups, the Ecology Youth Corps, and Department of Corrections. The current interagency agreement between Ecology and Transportation provided funding ($80,000) to offset the costs of disposal. In 2005, WSDOT crews removed and disposed of 30,625 cubic yards of litter from state roadways (roughly 6 million pounds).

Looking Ahead

Since launching the "litter and it will hurt" campaign in the spring of 2002, Ecology has tracked several indicators that suggest the state is on the right path to reducing roadway litter. The campaign evaluation conducted in 2006 further indicated where Ecology should focus future campaign activities: promoting the litter hotline and continuing to work with the law enforcement community. The new campaign plan should be completed by the end of 2006, with a re-launch of the "litter and it will hurt" campaign scheduled for spring 2007.

The bulk of Ecology's efforts in the next year will be managing the litter prevention campaign. Cleanup programs will continued to be monitored to make sure dollars are put towards the most efficient and effective programs and that the dirtiest areas of the state are addressed.

Chapter V
Solid Waste Generation, Disposal, and Recycling in Washington State

One of the basic aspects of carrying out the *Beyond Waste Plan* is preventing wastes in the first place, rather than managing wastes at the end of the pipe. Recognizing that we will continue to generate many wastes, the *Beyond Waste Plan* also calls for valuing these materials as resources, and moving them into closed-loop recycling systems instead of disposing of them.

In order to measure the progress of *Beyond Waste*, a record of the amount and types of waste generated is essential. To determine the amount of waste that is generated in Washington State, Ecology uses the amount of materials disposed each year, plus the amount of materials recycled and diverted from disposal. As we have gained more understanding of the waste stream and obtained better information about how wastes are managed, the way we calculate this number has changed.

The amount of waste generated continues to rise each year. Washington State's population has continued to grow since Ecology began to track disposal and recycling. Population growth rates in Washington have averaged 2 percent per year from 1988 to 2005, with the total population increasing by over 1.6 million during that period.[12] With an increasing population often comes an increase in waste generated. However, the amount of waste disposed of, as well as the amount recycled and diverted, has increased at a faster rate than the population. Figure 5.1 shows growth in total solid waste generation and population in Washington.

Changes in this report:

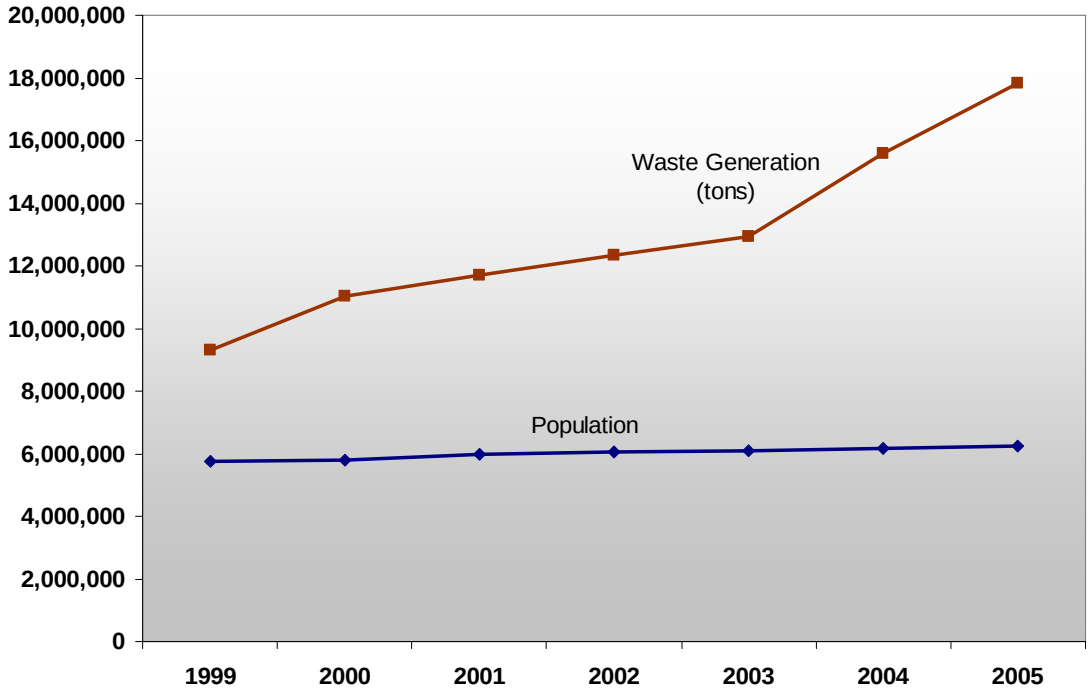
Instead of separate chapters on recycling and disposal, this chapter is a combined discussion of waste generation looking at the total amounts of waste recycled/diverted and disposed.

Because of this approach, the narrower, traditional definition of ***municipal solid waste recycling*** *and the details of that portion of the diverted waste stream are found in Appendix A.*

Since 1993, when Ecology began measuring the disposal stream through annual reports from disposal facilities, per capita waste generation has grown at an average annual rate of 5 percent, with the total annual waste generation increasing by over nine million tons. Since 1993, we have discarded over 145 million tons of waste to landfills and incinerators – that's roughly the amount of waste disposed annually in the United States.

[12] Population figures from Office of Financial Management: http://www.ofm.wa.gov/

Figure 5.1
Solid Waste Generation and Population growth in Washington



Determining the Amount of Waste Generated by Washington "Citizens" [13]

Total waste generation is determined simply by adding the amount of waste disposed to the amount of material recycled and diverted from disposal. It is easy to see why the materials we dispose of in landfills and incinerators are considered part of our "waste". However, materials that we separate from disposal for recycling or some other useful activity other than disposal are also a part of our total waste generation. These materials are entering the stream of discarded materials that will not be used again in their original form, hence the term "waste," even though these materials will be put toward better uses than landfilling.

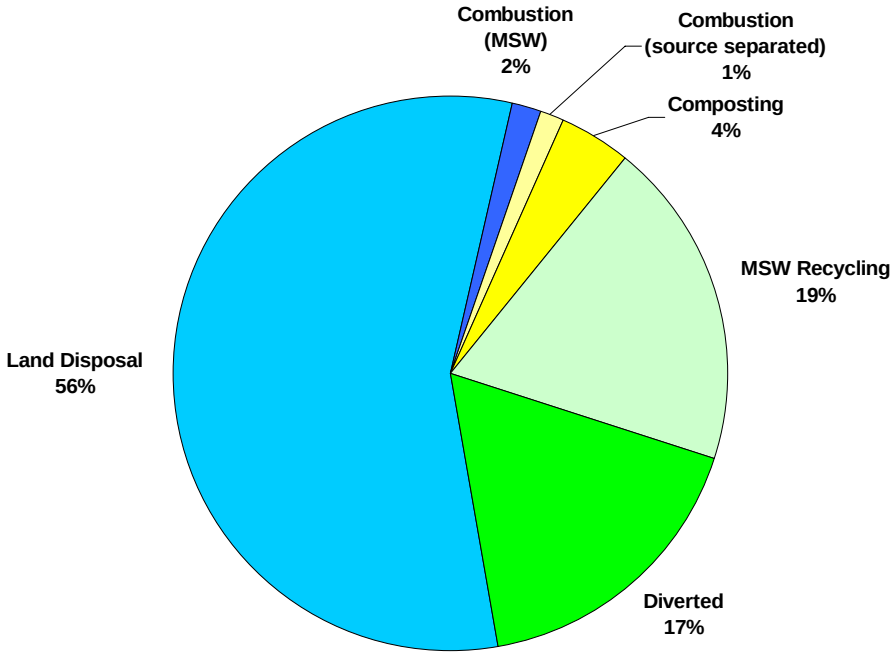
Ecology is currently measuring six types of final disposal and waste management methods:

- Disposal in landfills.
- Combustion of mixed MSW.
- Combustion of source separated material (burning for energy).
- Composting.
- Recycling (transforming material into the same or other products – MSW only).
- Diversion (includes recycling of non-MSW materials and reuse).

[13] "Citizens" as used in this chapter refers not only to each person in the state, but includes business, industries, manufactures and other activities that produce solid wastes.

Figure 5.2 shows a breakdown of the waste management methods in 2005.

Figure 5.2
Waste Management Methods 2005



Some material types have one unique final use. However, there is often more than one final use for a material reported as "recycled" or "diverted", depending on the market shifts and demand. Beginning in 2006, the recycling survey will ask for a more detailed breakdown of these uses for all materials reported.

The largest measured part of Washington's waste generation number is the disposed waste stream. This number has been increasing for several reasons. In some cases we are simply throwing away more. In addition, with the new reporting requirements from chapter 173-350 WAC, *Solid Waste Handling Standards*, we are getting more details on the wastes that we dispose of. We also are getting information about waste disposed of in other states (for example tires that are disposed in Oregon). We are including all materials that are disposed in landfills. An example is clean soil and rock, things that are not defined as solid waste by our regulations, but are disposed of as a waste at a landfill.

The other measured part of Washington's waste generation number is made up of materials recycled and diverted from disposal. The list of materials included under recycling and diversion has increased over time. Since 1986, largely materials that are defined as municipal solid waste by the Environmental Protection Agency have made up the recycling number. (See *Appendix A: Municipal Solid Waste Recycling* for complete details on MSW recycling).

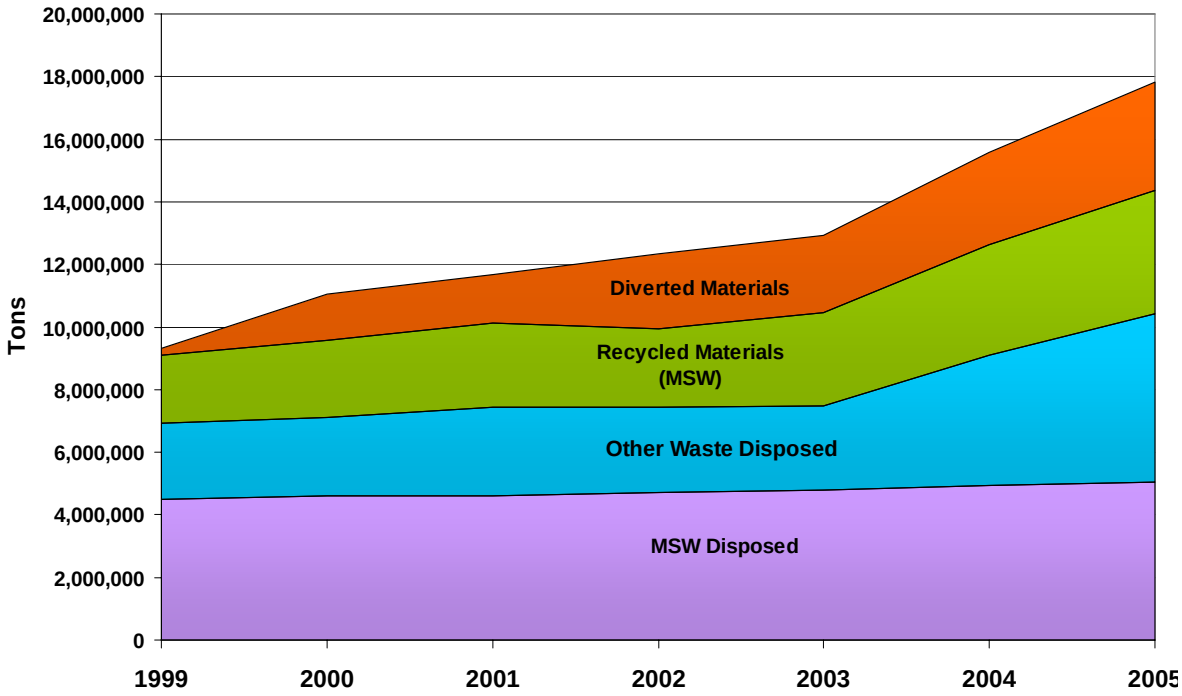
In 1999, along with MSW recycling we started tracking materials that were being "diverted" from disposal. We now include materials that are diverted from the waste stream but are outside of the state's definition of municipal recycling. This expanded measure of waste diversion includes recyclables such as construction and demolition debris, materials that are

burned for energy recovery, and reused materials. As more materials are diverted from disposal, the list of items will increase.

We have increased our efforts to get better reporting from recyclers and those that are diverting waste from disposal. Tracking additional materials, getting better reporting, as well as more actual recycling and diversion going on, the numbers have increased over time. In 2005, the total waste generation in Washington reached 17,862,518 tons.

Figure 5.3 shows the make up of solid waste generation under the broad categories of MSW disposed, other waste types disposed, MSW recycled and solid waste diverted from disposal (non-MSW).

Figure 5.3
Total Solid Waste Generation in Washington



Per Capita Waste Generation

One way to evaluate the amount of waste we produce is to look at the numbers on a "per capita" basis. That means the amount of waste generated by each person each day. We use the term in different ways in this report.

The recycling rate in *Appendix A: Municipal Solid Waste Recycling* looks at portion of the waste stream termed the **municipal solid waste stream**. This is waste that mainly households and commercial businesses generate and municipalities (cities and counties) typically report. This includes such items as durable goods, nondurable goods, containers and packaging, food waste and yard trimmings. It does not include industrial waste, inert debris, asbestos,

biosolids, petroleum contaminated soils, or construction, demolition and landclearing debris. Materials that are recycled in the former category make up the "traditional" recycling rate. Some materials in the later group that are diverted from disposal make up the "diversion" rate.

Per capita numbers from Appendix *A: Municipal Solid Waste Recycling* for just the **municipal solid waste stream** are shown in Table 5.1. The per capita generation of **municipal solid waste** in the state in 2005 was 7.86 pounds per person per day, 4.43 pounds were disposed of and 3.43 pounds were recovered for recycling. (For per capita MSW numbers 1986-2005 see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.)

Table 5.1
Municipal Solid Waste Disposed, Recycled and Generated
(pounds/person/day)

MSW only	2000	2001	2002	2003	2004	2005
Disposed	4.29	4.23	4.27	4.32	4.37	4.43
Recycled	2.29	2.48	2.28	2.69	3.14	3.43
Generated	6.58	6.71	6.55	7.01	7.51	7.86

Municipal solid waste is not all the waste that is produced in the state. To determine the **total waste generation**, we add **all** of the materials recycled, diverted and disposed. This includes not only MSW disposed, but all other waste types disposed at landfills and incinerators, as well as recycled and diverted materials. This results in a much higher generation number for the state of 15.62 pounds per person per day, with 6.49 pounds recycled/diverted and 9.14 pounds disposed (Table 5.2).

Table 5.2
All Solid Waste Disposed, Recycled/Diverted and Generated
(pounds/person/day)

Per Capita	2000	2001	2002	2003	2004	2005
Disposed[14]	7.06	6.84	6.74	6.62	8.03	9.14
Recycled/Diverted	3.69	3.91	4.46	4.91	5.78	6.48
Generated	10.75	10.75	11.20	11.52	13.80	15.62

These numbers are not just waste that is disposed by each person from their household. These include wastes produced by business, industries and other manufacturing activities in our state. They also include wastes that are being cleaned up from our environment, like

14 Disposed amounts include all waste generated from Washington disposed in MSW, limited purpose, and inert landfills and incinerators, both instate and exported.

petroleum contaminated soils from leaking gas tanks at service stations, asbestos being removed from buildings that are torn down or remodeled, and contaminated soils that are dredged from Puget Sound. These types of wastes should be placed in a landfill.

Much of the waste stream includes wastes that could be recycled or reused, or just not made in the first place. These are wastes that we need to focus prevention and reduction efforts on as described in the state's *Beyond Waste Plan*. We want to see less waste in the categories of municipal and commercial solid waste, industrial waste, construction and demolition waste, inert waste, wood waste, other organic wastes and tires.

Waste Disposed by Washington "Citizens"

The amount of waste disposed each year continues to increase. In 2005, a total of 10,415,994 tons was disposed. Table 5.3 shows the amounts and general types of waste disposed of since 1994 by Washington citizens[15].

As part of the annual reporting requirements of chapter 173-351, *Criteria for Municipal Solid Waste Landfills* and chapter 173-350 WAC, *Solid Waste Handling Standards*, all landfills and energy recovery facilities report the source, types and amounts of waste received from their county, other counties, other states, or other countries. We also include data from three municipal solid waste landfills in Oregon (Finley Butte, Wasco, and Columbia Ridge) that receive waste from Washington State. Spreadsheets identifying the disposal location, type and amount of waste for each county for 2005, and previous years' information, can be found at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

[15] Citizens in this chapter does not only refer only to an individual, but includes business, industry, public and private sectors; anyone who produces waste.

Table 5.3
Waste Disposed by Washington Citizens
(1994-2005)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
MSW/ Commercial	3,974,383	3,905,291	3,800,114	4,203,507	4,276,276	4,480,761	4,610,914	4,611,406	4,703,879	4,805,205	4,917,870	5,060,502
Demolition	479,479	482,118	502,425	462,784	529,515	530,417	685,799	759,586	835,400	650,473	884,567	1,014,526
Industrial	187,506	155,141	184,220	206,169	208,398	325,135	157,634	563,249	546,299	743,042	1,356,415	1,092,305
Inert	11,385	5,154	4,091	117,512	107,452	23,875	19,542	428,789	321,451	280,358	419,115	1,337,372
Wood	39,190	41,615	58,355	221,437	89,142	158,022	197,929	246,754	91,697	90,303	89,905	61,918
ASH (other than SIA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	536,651	420,222
Sludge	76,675	71,941	55,584	72,747	65,440	62,919	95,050	1,473	1,762	22,835	10,171	12,458
Asbestos	23,897	10,369	9,385	13,130	13,044	12,961	11,777	10,929	11,177	15,455	18,252	21,951
Petroleum Contaminated Soils	242,981	214,174	270,980	474,907	198,082	372,734	284,778	616,725	784,703	568,681	489,385	957,788
Other Contaminated Soils	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	146,554	231,428
Tires	11,082	25,023	5,226	2,724	12,129	10,362	40,908	7,752	4,919	5,102	15,212	22,446
Medical	N/A	N/A	5,213	7,469	7,704	5,474	6,349	5,255	2,417	2,498	2,624	2,651
Other	81,573	144,115	121,051	10,794	41,866	28,450	178,156	198,259	124,512	270,992	196,793	197,010
Total	**5,128,151**	**5,054,941**	**5,016,644**	**5,793,180**	**5,549,048**	**5,537,142**	**6,288,836**	**7,450,177**	**7,428,216**	**7,454,944**	**9,083,516**	**10,432,576**

The types of wastes that are reported by landfills are very general and it is hard to know exactly the types of materials that are included. For example, the municipal solid waste, as it is reported by disposal facilities, would include anything that a household or a business throws away. We don't know how much of that waste is paper, food, cans, plastics, bottles, other recyclable materials or who actually made the waste – a household or a business. We also don't know the specific content of wastes reported as industrial or inert. It is difficult to focus waste reduction and recycling efforts on a particular type of waste or on a producer of that waste without having more details. The details can only be determined through a rigorous sampling study, such as a waste characterization study.

A waste characterization study provides a much more detailed look at what is in the waste stream. There are various ways to conduct a waste characterization study. A statewide study could take samples of waste from various sources. For example, a garbage truck from a known neighborhood would be emptied at a transfer station. The waste from that truck would be sorted into several different material groups. It would be repeated during all four seasons. Other sampling would be done in other locations around the state. Depending on the needs of the study, various sources of the waste (that is the sector of society where the waste was made – residential single-family, multi-family, commercial, institutional, industrial, agricultural, etc.) could be sampled.

These studies provide very valuable information that is critical for us to understand the makeup of the waste stream, to know who is producing the waste, and to know what materials are in the waste stream that we should be reducing or eliminating. To be the most useful, waste characterization studies need to be repeated on a regular basis, but they are expensive to conduct.

A statewide waste characterization was last completed in 1992. Since then some individual counties have conducted waste characterizations studies. Information from them has been extrapolated for use statewide.

As we move forward with implementing the *Beyond Waste Plan*, specific information on the contents of our waste will be essential to understand the makeup of the solid waste stream. This will help us focus efforts to eliminate and reduce specific types of wastes or materials, and allow us to measure our progress. Ecology is evaluating methods and possible funding alternatives to conduct regular statewide waste characterization studies.

Waste Recycled and Diverted from Disposal[16]

Measuring Recycling and Diversion Rates

To determine a recycling rate that is consistent and comparable to past years, Ecology has measured a very specific part of the solid waste stream since 1986. It is roughly the part of the waste stream defined as municipal solid waste (MSW) by the Environmental Protection Agency.[17] Since the mid-1990s, however, Ecology has noted very large increases of material

[16] See *Appendix A: Municipal Solid Waste Recycling* for a complete discussion of MSW Recycling.

[17] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes durable goods, nondurable goods, containers and packaging, food wastes, and yard trimmings. It

recovery in "non-MSW" waste streams. Most notable are the growing industries in recycling asphalt, concrete, and other construction, demolition, and landclearing debris. The recovery of these materials for uses other than landfill disposal is termed "diversion."

Increasingly, Washington counties and cities have been putting efforts into recovering and recycling these wastes that are outside of the traditional MSW stream. The construction and demolition waste stream provides the best example. We are now recycling many of these materials, including asphalt, concrete, roofing material, lumber, various metals, and more. Knowledge of this waste stream is increasing, although it is not easy to characterize.

Measuring diverted materials is as simple as collecting the number of tons of material diverted from landfills. Many recycling survey respondents have voluntarily listed this information on the recycling survey in the past; in 1999 Ecology began asking for it more specifically.

We are now calculating a "diversion" rate alongside of the traditional "MSW recycling" rate. Calculating the diversion rate takes two steps. First, Ecology measures non-MSW materials diverted from the waste stream along with recyclables that are part of MSW. Ecology then compares the resulting figure to total waste generation (minus a subset of landfilled materials that were not available for recycling or diversion).[18] Washington shows a diversion rate of 48 percent in 2005. (See Table 5.4.)

Table 5.4
Diversion Rates
1999 to 2005

Year	Diversion Rate
1999	28%
2000	37%
2001	41%
2002	45%
2003	47%
2004	48%
2005	48%

Wood waste is a large portion of the recovery stream in Washington. A major portion of the recovered wood is eventually burned for energy recovery. A percentage of it is also being used in new wood and paper products, as a feedstock in composting operations, and as mulch. In 2002, Ecology began to gather figures on recovered wood that is burned and to measure it as a diverted material. Ecology believes that an undetermined amount of the wood reported as "recycled" is actually burned for energy recovery or used as "hog fuel."

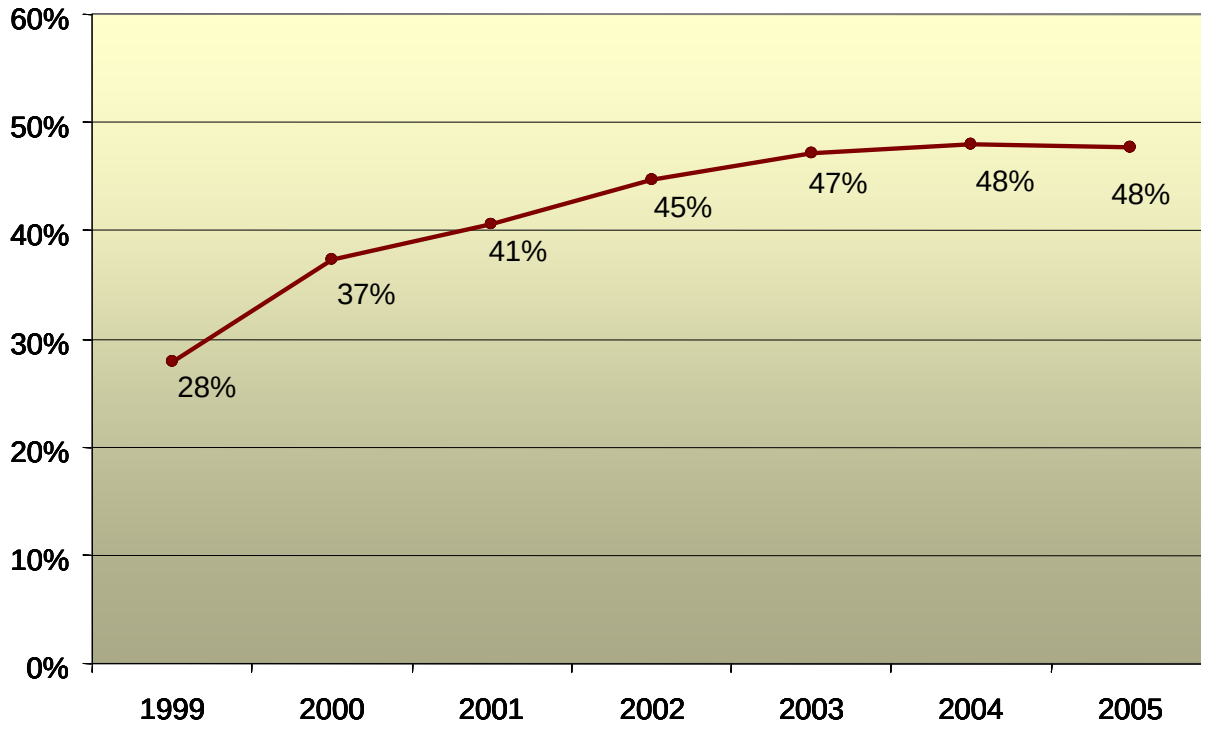
In agriculture, waste materials are being composted and processed for land application as soil amendments. Ecology recognizes these and other uses of discarded material as potentially beneficial and includes them in the diversion numbers.

Figure 5.4 shows the diversion rate in Washington since Ecology began measuring it in 1999.

does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition, and landclearing debris disposed of at municipal solid waste landfills and incinerators.

[18] Waste types used to calculate diversion include municipal, demolition, inert, commercial, wood, tires, medical, and other. Excludes industrial wastes, asbestos, sludge and contaminated soils.

Figure 5.4
Washington State Diversion Rates – 1999 to 2005



Ecology maintains that we need to study the non-MSW waste stream in more detail. We lack definite information on the total volume of waste created, especially in the industrial sector. If the facility diverting material is conditionally exempt from permitting under chapter 173-350 WAC, *Solid Waste Handling Standards*, the reporting requirement for solid waste recyclables covers these activities. However, if the facility does not fall under requirements for conditional exemption from solid waste permitting, reports are voluntary, as with out of state facilities or haulers with no fixed facility. This makes it difficult to figure a recycling or diversion rate for many of these materials. Ecology may lack enough information on the amount of waste created.

Measurement Methodology

The Legislature requires Ecology to measure the recycling activity in the state each year and report the results. From 1986 until 2002, the tools for measuring recycling activity in Washington included only the annual recycling survey. With the new reporting requirements under chapter 173-350 WAC, *Solid Waste Handling Standards*, the measurement tools now include annual reports for recycling facilities and intermediate solid waste handling facilities, along with the annual recycling survey. We are receiving more information with these additional reporting requirements.

Ecology sends survey and annual reporting forms to recycling facilities, firms, haulers, and local governments. These parties reply with information about the types and quantities of recyclable materials they collected. Though the recycling survey portion of the measurement

tool is mandatory, there is no penalty for not returning the information and some firms do not respond. Some firms respond with estimates of the amount and origin of the materials. These factors offer challenges to compiling good county-specific recycling and diversion information. This situation also creates the need for intensive cross-checking of the data. This is done through a phone and e-mail survey of the end-users of recyclable materials, recycling facilities, other intermediate collectors of recyclables, and local governments. Ecology develops aggregate figures for each commodity and compares these to the results collected.

The recycling survey is essentially voluntary in that the rule puts forth no penalty for those who do not respond. The annual reports for facilities are mandatory in that facilities could receive a penalty for failing to submit an annual report. Ecology bases the reliability of the results on review of draft numbers sent to local governments, and comparisons to waste characterization, disposal data, and commodity end-user information. Companies reporting on the recycling survey may just report tonnage they collected directly from generators. Facilities responding to annual reports, however, need to submit tonnage information for all materials handled at their facility. Also, county recycling coordinators and solid waste managers are asked to review the figures. Finally, Ecology checks figures against double-counting by verifying exchange of materials between reporting entities.

For the 2005 reporting year, both the recycling survey forms and the annual reporting forms were available on the Internet. Respondents can now print and complete the forms on paper or type on-line and e-mail the forms to Ecology. This system proved to be very successful. It provided the crucial and time-saving computer access to the survey, which some respondents needed. It also allowed Ecology staff to check the forms and follow up on errors or calculate conversion (pounds to tons, for example) before entering the data into the off-line database. This crucial quality-control step helps maintain integrity of the data.

Results – 2005 Diversion

When Ecology began to measure other materials than traditional MSW recycling, the expanded measure continued to include the same materials that it used since 1986 in the calculation of the MSW recycling rate. These materials are those originating from the MSW stream, as Ecology defined it when designing the recycling survey in the mid-1980s. (See *Appendix A: Municipal Solid Waste Recycling*) Table 5.5 provides tonnage figures for each material that figures into the diversion rate from 2002 to 2005.

Other "diverted" materials are surveyed and reported. However, including these materials in the MSW recycling rate would make the comparison invalid for the trends over time. This is because either these diverted materials lie outside the MSW stream or they are recently entering the recycling stream. Most parties that collect and process the diverted materials do so from sources outside the traditional residential and commercial waste stream. Still, Ecology recognizes the creative efforts of local governments and businesses in addressing these wastes and diverting huge amounts of material from landfills. The list of diverted materials is not an exhaustive list, neither are the numbers complete for these material categories. It is simply a list of the materials reported to Ecology that appear to constitute a diversion of the material from the landfill.

Table 5.5
Diverted & Recycled Materials Reported (tons)[19]
Diversion Rates 2002-2005

Diverted and Recycled Materials Reported	2002	2003	2004	2005
Aluminum Cans	12,718	17,608	16,010	**15,441**
Antifreeze	4,506	4,722	8,050	**8,767**
Ash, Sand & Dust used in Asphalt Production	290	10,576	40,409	**14,588**
Asphalt & Concrete	1,451,959	1,600,288	2,002,171	**1,783,418**
Carpet and Pad	148	258	304	**186**
Composting Furnish	67,338	36,049	44,419	**81,904**
Computers & Parts	1,414	3,587	6,568	**8,534**
Construction & Demo. Debris	131,701	143,844	166,325	**521,087**
Container Glass	64,937	74,126	81,405	**82,773**
Corrugated Paper	417,534	430,750	535,662	**565,698**
Donated Food & Merchandise	-	-	306	**435**
Ferrous Metals	432,778	709,881	866,641	**974,535**
Fluorescent Light Bulbs	417	772	732	**729**
Food Processing Wastes	-	3,774	3,185	**38,823**
Food Waste	70,904	100,755	126,257	**125,390**
Gypsum	51,089	76,946	35,648[20]	**56,618**
HDPE Plastics	6,029	8,485	7,991	**9,319**
High-Grade Paper	62,312	59,502	70,210	**58,661**
Household Batteries	333	143	149	**294**
Industrial Batteries	5	30	29	**-**
Landclearing Debris	286,201	160,158	268,486	**475,015**
LDPE Plastics	9,775	17,925	10,604	**16,209**
Mattresses	77	-	-	**-**
Milk Cartons/Drink Boxes-Tetra	26	1,789	8	**4,529**
Miscellaneous	-	40	5	**108**
Mixed Paper	206,051	219,111	230,934	**322,732**
Newspaper	187,585	215,882	261,306	**259,157**
Nonferrous Metals	61,240	114,604	99,317	**122,490**
Oil Filters	5,023	1,750	3,719	**2,721**
Other Fuels (Reuse & Energy Recovery)	121,349	2	115	**16**
Other Recyclable Plastics	949	3,482	7,783	**7,247**

[19] Detail may not add due to rounding. See *Appendix A: Municipal Solid Waste Recycling* for a list of materials counted as MSW recycling.

[20] Decrease can be attributed to a drop in reporting for this material.

Diverted and Recycled Materials Reported	2002	2003	2004	2005
Other Rubber Materials	166	5	12	-
Paint (Reused)	434	389	688	**912**
PET Plastics	5,886	6,060	6,748	**8,534**
Photographic Films	517	530	522	**487**
Post-Industrial & Flat Glass	2,364	2,976	2,253	**4,877**
Post-Industrial Plastics	8,118	-	-	**697**
Reuse (Clothing & Household)	79	918	738	**2,891**
Reuse (Construction & Demolition)	76,629	11,927	5,853	**1,929**
Reuse (Miscellaneous)	310	7,488	215	**24**
Roofing Material	13,825	6,493	8,186	**2,353**
Textiles (Rags, Clothing, etc.)	9,440	15,497	28,927	**28,750**
Tin Cans	9,417	9,492	10,082	**12,133**
Tires	27,102	27,753	37,568[21]	**53,777**
Tires (Burned for Energy)	2,818	9,664	15,400	**5,167**
Tires (Retreads)	1,170	12,976	251	**4,089**
Topsoil	-	228,202	269,460	**338,456**
Used Oil	43,367	56,344	104,211	**111,692**
Used Oil for Energy Recovery	30,838	15,580	825[22]	**306**
Vehicle Batteries	12,158	18,780	25,518	**28,903**
White Goods	43,833	53,353	56,920	**47,302**
Wood	394,261	208,920	257,495	**351,855**
Wood Fiber/Industrial Paper	-	13,767	213	-
Wood for Energy Recovery	196,100	189,584	129,927	**163,408**
Yard Debris	380,882	546,487	646,674	**643,376**
Yard Debris for Energy Recovery	-	-	-	**30,859**
Total Diverted + Recycled Materials	**4,914,403**	**5,460,025**	**6,503,434**	**7,400,202**
Total Wastes Disposed[23]	**6,084,275**	**6,122,052**	**7,062,771**	**8,116,647**
Total Waste Generation	**10,998,676**	**11,582,076**	**13,566,205**	**15,516,847**
Diversion Rate	**44.68%**	**47.14%**	**47.94%**	**47.69%**

[21] In 2004 and 2005, tires include recycled and retreaded tires.

[22] In 2004 and 2005, a portion of the used oil burned for energy recovery is reported as recycled and included above.

[23] For purposes of calculating a diversion rate, this analysis includes only the wastes that are potentially recyclable. Waste types used in this calculation include MSW, demolition, inert, wood, tires, medical waste and other unclassified wastes. It excludes industrial wastes, asbestos, sludge, and contaminated soils.

Waste Disposed in the State of Washington

Another way to look at the waste disposed is to include all the waste that goes to landfills or incinerators in the state. This includes waste brought in from out of state, but does not include waste sent out of state for disposal. With all categories included, 8,772,451 tons of waste was disposed of in all types of landfills and incinerators in Washington in 2005 (see Table 5.6). For total solid waste disposed of from 1993-2005 see

Table 5.6
Total Amounts of Solid Waste Disposed of in Washington

http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

DISPOSAL METHOD	1998	1999	2000	2001	2002	2003	2004	2005
Municipal Solid Waste Landfills	4,582,107	4,738,808	4,659,582	4,525,019	4,744,561	4,572,275	5,506,112	5,517,342
Incinerated Waste	369,778	461,684	554,780	496,152	311,474	303,978	327,837	335,533
Woodwaste Landfills*	59,410	102,484	87,552	53,298	33,171	34,188	*	*
Inert/Demolition Landfills	494,528	536,155	477,383	733,843	476,917	476,214	509,927	1,531,642
Limited Purpose Landfills	628,896	569,747	646,662	645,592	605,284	586,670	1,075,102	1,387,934
TOTAL	**6,134,719**	**6,408,878**	**6,425,959**	**6,453,904**	**6,171,407**	**5,973,325**	**7,418,978**	**8,772,451**

* The category of woodwaste landfills is no longer included under *chapter 173-350 WAC, Solid Waste Handling Stan*dards.

Municipal Solid Waste Landfills

Amount of Waste Disposed of in Municipal Solid Waste Landfills

In 2005, 16 municipal solid waste landfills accepted waste totaling 5,577,342 tons.[24] Of the 16 landfills, 13 were publicly owned and 3 were privately owned.

Six of the 16 landfills received over 100,000 tons of waste in 2005. Three of the largest landfills in Washington, Cedar Hills in King County, LRI – 304th Street in Pierce County, and Roosevelt Regional Landfill in Klickitat County, received 988,855 tons, 960,450 tons, and 2,434,841 tons, respectively. In 2005, two landfills received less than 10,000 tons, Ephrata Landfill in Grant County and Northside Landfill in Spokane County, compared with 12 MSW landfills in 1994. The City of Tacoma Landfill received no waste and will be used for emergencies only in the future.

24 Throughout this report, different disposal amounts are discussed. These numbers vary based on the types of facilities being discussed, the source of the waste and the purpose of the discussion. For example, the recycling survey only accounts for "traditional" municipal waste in the disposed amount used to calculate the statewide recycling rate.

Figure 5.5 shows that several smaller and a few mid-sized landfills closed between 1995 and 1996 in response to the more stringent regulations for MSW landfills (chapter 173-351 WAC, *Criteria for Municipal Solid Waste Landfills*). Other landfills are reaching their remaining capacity and are not planning on expanding. There has been a gradual decrease in the number of landfills since 1996. At this time no new landfills are planned in the state.

Figure 5.5
Number of MSW Landfills
(based on tons disposed)

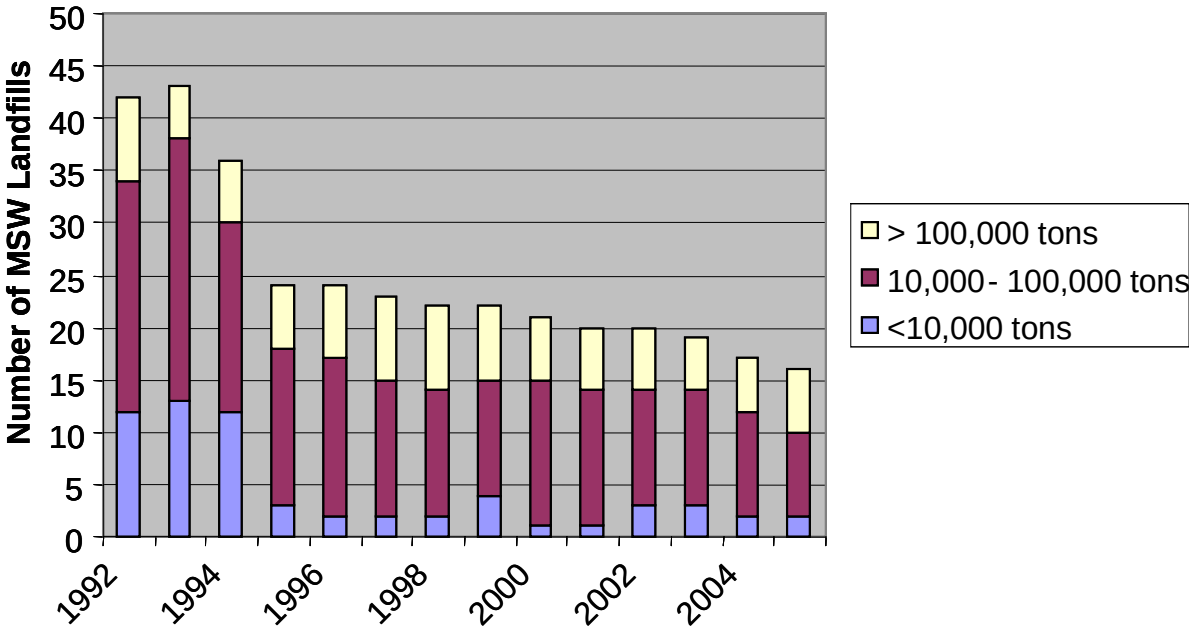
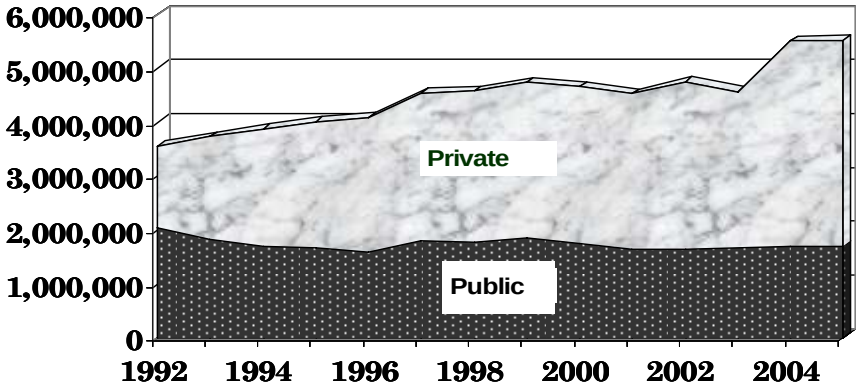


Table 5.7 shows the relationship of waste disposal to public/private ownership. As the table illustrates, 1,704,663 tons of solid waste disposed of went to publicly owned facilities (31 percent), with the remaining 3,812,679 tons going to private facilities (69 percent).

Table 5.7
Waste Disposed in MSW Landfills – Public/Private

OWNERSHIP	NUMBER OF MSW LANDFILLS		AMOUNT OF WASTE DISPOSED (Tons)		% TOTAL WASTE DISPOSED	
	1991	2005	1991	2005	1991	2005
PUBLIC	36	12	2,696,885	1,704,663	69	31
PRIVATE	9	4	1,192,207	3,812,679	31	69
TOTAL	**45**	**16**	**3,889,092**	**5,577,342**	**100**	**100**

Figure 5.6
Comparison of Waste Disposed in Public and Private MSW Landfills (tons)



The amount of waste disposed of in MSW landfills shows movement from the publicly owned facilities to those owned by the private sector (see Figure 5.6). The trend has continued since 1991, when the state first started tracking this type of information. The amount of waste disposed of in the private facilities has increased from 31 percent since 1991 to 69 percent in 2005. The private Roosevelt Regional Landfill in Klickitat County and LRI-304th Street Landfill in Pierce County can account for the majority of this increase.

Types of Waste Disposed of in Municipal Solid Waste Landfills

Traditionally, many people think of the waste going into MSW landfills as being mostly household waste.[25] Annual facility reports show that a much wider variety of waste is disposed of in the MSW landfills. These wastes need to be considered in terms of remaining available capacity. Fourteen of the sixteen landfills reported disposing types of solid waste other than MSW. Demolition, industrial, inert, wood waste, sludge, asbestos, petroleum-contaminated soils (PCS), other contaminated soils and tires were the major waste streams. (Two landfills reported all types of waste under the general "municipal" category so exact amounts cannot be determined. Other landfills report in only a few categories. This makes knowing exact amounts of waste difficult.).

In 2004, Ecology developed new annual reports expanding the list of waste types. For the amounts and types of waste that individual MSW landfills reported in 2005, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

For a more consistent look at the waste stream over time, this report combined some categories. Table 5.8 shows changes in waste, types, and amounts disposed of in MSW landfills from 1997 through 2005. For MSW landfill data from 1992-2005, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

25 "Household waste" as defined in chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills, means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas).

Table 5.8
Waste Types Reported Disposed in MSW Landfills

WASTE TYPES	1997 (Tons)	1998 (Tons)	1999 (Tons)	2000 (Tons)	2001 (Tons)	2002 (Tons)	2003 (Tons)	2004 (tons)	2005 (Tons)
Municipal Solid Waste*	3,083,286	3,222,639	3,421,415	3,336,745	3,432,359	3,440,727	3,394,428	3,598,760	3,631,873
Demolition Waste	385,412	446,172	437,005	569,239	373,254	379,405	324,069	366,087	541,945
Industrial Waste	163,431	159,781	232,905	88,841	201,198	179,058	212,918	1,034,615	624,958
Inert Waste	117,512	107,452	23,875	19,349	26,376	17,092	2,635	1,705	15,780
Commercial Waste	173,863	158,256	129,070	93,752	66,391	99,048	93,036	-	-
Wood	57,128	60,383	68,889	47,087	34,254	55,149	47,622	25,576	9,896
Ash (other than SPI)	-	-	-	-	-	-	-	3,444	2,857
Sewage Sludge	72,741	67,419	62,920	47,783	1,473	1,762	23,435	10,172	12,476
Asbestos	9,558	10,684	9,666	7,922	5,991	4,908	9,625	12,086	7,943
Petroleum Contaminated Soils	444,260	288,407	312,247	231,290	217,721	457,061	342,172	279,982	320,283
Other Contaminated Soils	-	-	-	-	-	-	-	49,454	212,692
Tires	14,912	19,130	12,581	43,188	8,567	5,776	9,512	7,462	6,942
Special	6	904	-	437	917	567	-	-	-
Medical	-	-	-	239	387	372	2,459	2,565	2,576
Other**	10,809	40,880	28,235	173,711	156,131	103,636	110,364	114,204	127,121
TOTAL	**4,532,918**	**4,582,107**	**4,738,808**	**4,659,582**	**4,525,019**	**4,744,561**	**4,572,275**	**5,506,112**	**5,577,342**

* Some facilities include demolition, industrial, inert, commercial and other small amounts of waste types in the MSW total.

** Some of the "other" types of waste reported include non-municipal ash, auto fluff and white goods.

Future Capacity at Municipal Solid Waste Landfills

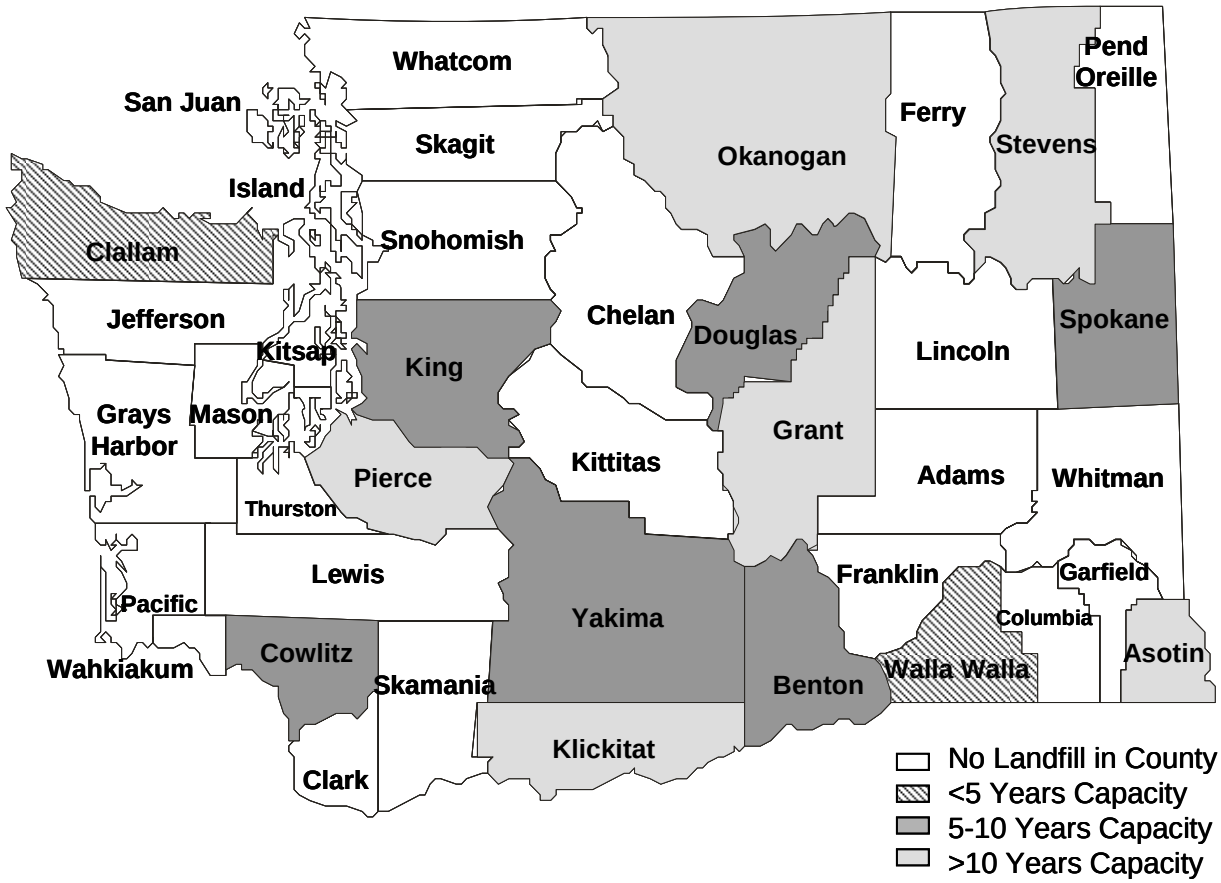
As of September 2006, 16 MSW landfills were operating in Washington State. Ecology determined the amount of remaining capacity for these landfills by asking them to report remaining permitted capacity, as well as the expected closure date. In 2006, the facilities estimated about 208 million tons, or about 38 years, of capacity at the current disposal rate. Changes in permit conditions, early landfill closures, projections of fewer expansions, and changing volumes affect remaining capacity, which has fluctuated the past several years. Of the 16 currently operating landfills, 11 have greater than 5 years of remaining permitted capacity. (See Table 5.9 for an estimated number of facilities with specified remaining years of life.)

Table 5.9
Estimated Years to Closure for MSW Landfills

YEARS TO CLOSURE	% OF TOTAL REMAINING CAPACITY	NUMBER OF FACILITIES	PUBLIC	PRIVATE
Less than 5 years	< 1%	5	4	1
5 to 10 years	> 3%	4	4	0
Greater than 10 years	> 96%	7	5	2
TOTALS	**100%**	**16**	**13**	**3**

Map 5.A shows the counties and the remaining years of capacity of their MSW landfills.

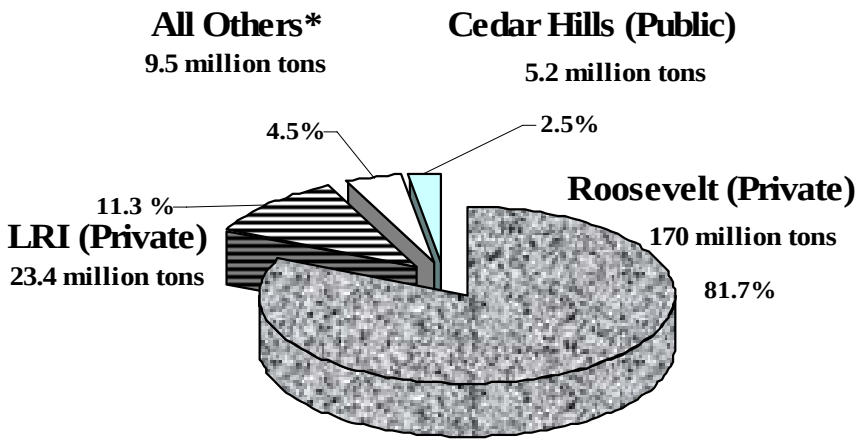
Map 5.A: Remaining Permitted MSW Landfill Capacity
(as of April 2004)



Capacity numbers in 2006 indicated that about 96 percent of the remaining capacity was at landfills with more than 10 years before closure. Thirteen of the 16 operating MSW landfills are publicly owned with about 7 percent of the remaining capacity (14.7 million tons). About 93 percent of the remaining permitted capacity (193.4 million tons) is at the three privately

owned facilities, compared to 73 percent in 1993. The majority of the capacity, about 81.7 percent of the total statewide capacity, is at the privately owned Roosevelt Regional Landfill in Klickitat County. Another 11 percent of the statewide total capacity is at the LRI privately owned landfill in Pierce County, along with 2.5 percent at the publicly owned Cedar Hills landfill in King County. The remaining 4.5 percent of capacity is spread among the remaining 13 landfills in the state (see Figure 5.7).

Figure 5.7
2006 Remaining Permitted Capacity at MSW Landfills



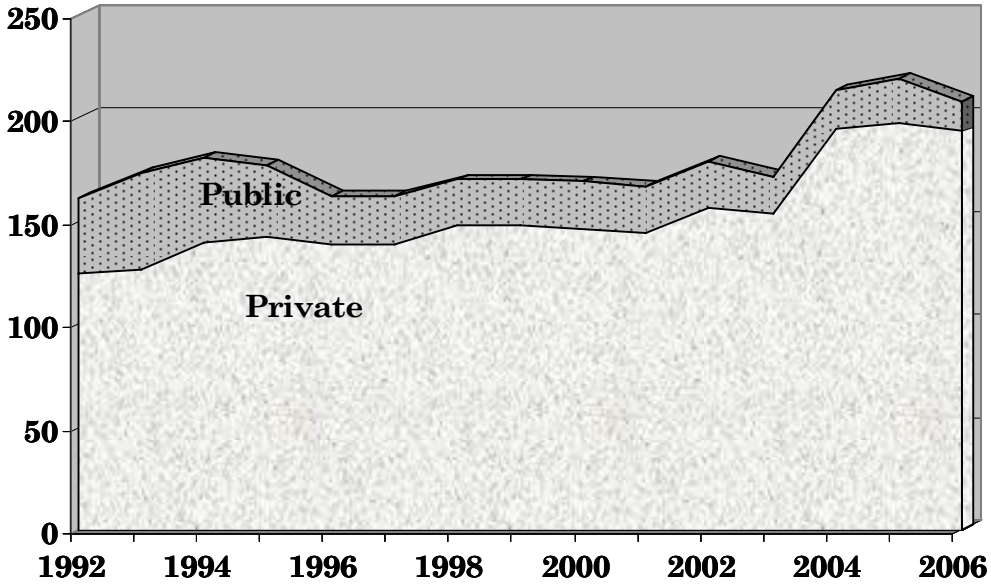
***All others includes public & private**

The Oregon Department of Environmental Quality was asked about the remaining capacity at the three municipal solid waste landfills that receive waste from Washington. Estimates are over 200 million tons of remaining capacity, or between 80-100 years.

The remaining capacity at private landfills has exceeded that for public facilities since the amounts were tracked in 1992 (see Figure 5.8).

Besides the amount of remaining capacity, the availability of that capacity needs to be considered. The Roosevelt Regional Landfill accepts waste from a wide variety of locations (see Map 5.C). In 2005, the facility received some type of solid waste from 29 counties in Washington, including the majority of the solid waste from twelve counties. Waste was also received from Alaska, Oregon, British Columbia, and Idaho. For other counties that do not have landfills, Roosevelt or the Oregon landfills have become the disposal option. Other landfills in the state accept the majority of waste from the county in which they operate. In order to reserve the capacity for local citizen needs, some are also using regional facilities for some of their disposal needs.

Figure 5.8
Remaining Capacity MSW Landfills
(public/private in million tons)



Ecology bases its 38-year estimate of total remaining permitted capacity on the amount of waste disposed of in MSW landfills in 2005. This amount will vary depending upon waste reduction and recycling activities, population growth or decline, and the economy. Other contributing factors include the impact of waste being imported into the state for disposal or a shift to in-state disposal of waste that is currently being exported. Cleanup activities, such as dredging contaminated sediments from Puget Sound, will add large volumes to the disposal totals.

As requirements change for other types of landfills in chapter 173-350 WAC, *Solid Waste Handling Standards*, some of those facilities may close. This will likely lead to an increase in the types and amounts of materials recycled, as well as to a shift in the types of solid waste moving to the MSW landfills for disposal.

Waste-to-Energy/Incineration

Three waste-to-energy facilities and incinerators statewide burned 327,837 tons of solid waste. Of that amount, 14,410 tons were wood waste at the Inland Empire Paper facility in Spokane, and 43,059 tons were waste at the Ponderay Newsprint Company in Pend Oreille County. These two incinerators do not burn MSW. In 2004, less than 6 percent of solid waste was incinerated statewide. The highest percent of waste incinerated in the state was 12 percent in 1995. For the amounts and types of waste incinerated in 2004, using the new reporting categories, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/).

MSW Landfill Disposal vs. Incineration

Table 5.10 shows a comparison of the amount of solid waste disposed of in MSW landfills and waste-to-energy facilities and incinerators in 2005.

Table 5.10
Waste Disposed of in MSW Landfills and Incinerators in 2005

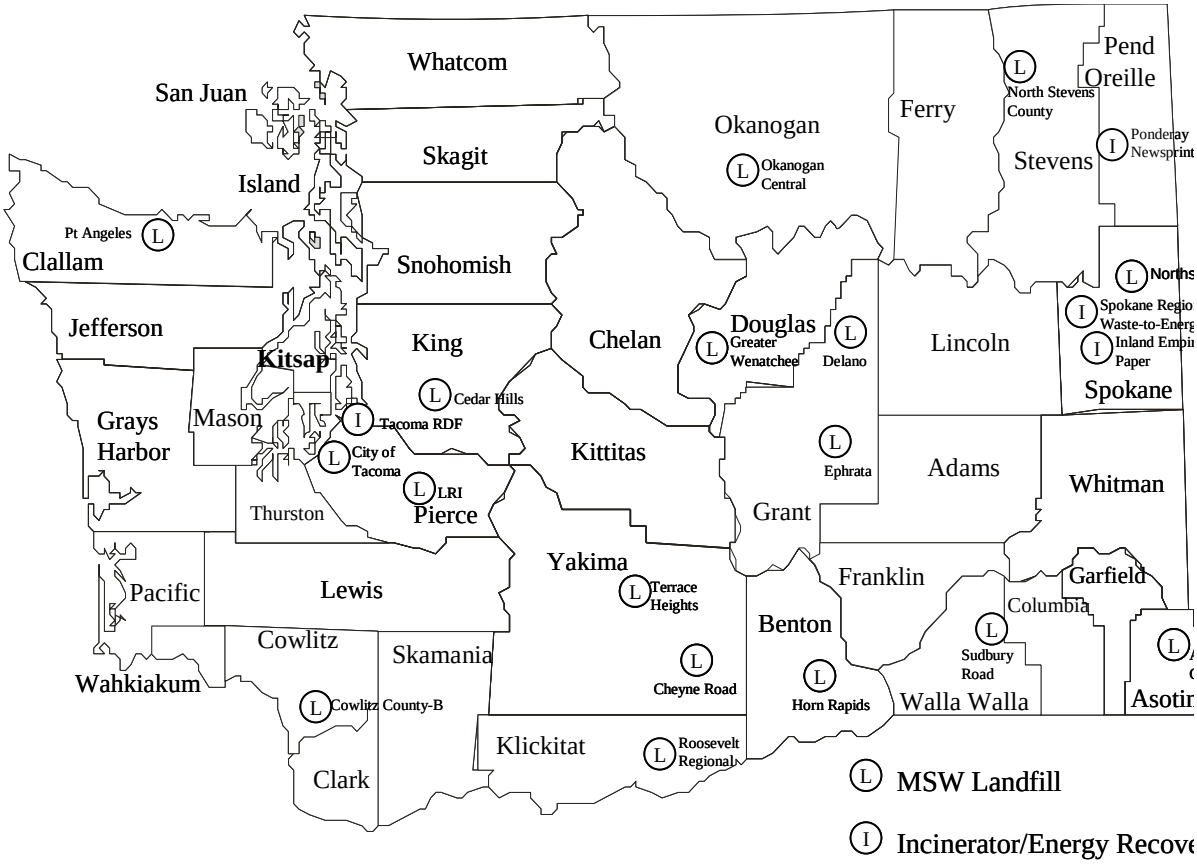
FACILITY TYPE	TONS	PERCENT (%)
MSW Landfills	5,517,342	94%
Incinerators	335,533	6%
TOTAL	**5,852,875**	**100%**

In 1991, 98 percent of the waste was disposed of in MSW landfills and 2 percent was incinerated. The highest percent of incinerated waste in the state, 12 percent, occurred in 1995. In 2005, about 6 percent of the waste stream was incinerated. The amount of waste incinerated will likely remain fairly stable, with only one operating MSW energy-recovery facility and no new facilities planned.

Location of MSW Landfills and Energy Recovery Facilities

Map 5.B. shows the location of MSW landfills and energy-recovery facilities in Washington.

Map 5.B: Location of MSW Landfills & Energy Recovery Facilities (as of October 2006)



Waste Disposed in Other Types of Landfills

Ash Monofill

Waste-to-energy facilities that generate more than 12 tons per day of MSW must dispose of their ash in a properly constructed ash monofill. (Chapter 173-350 WAC, *Solid Waste Handling Standards*, and chapter 173-306 WAC, *Special Incinerator Ash Management Standards*, now regulate these facilities.) In 2005, the only facility of this type in the state, the Spokane Waste-to-Energy Recovery facility, sent 80,842 tons of special incinerator ash to the ash monofill at the Roosevelt Regional Landfill in Klickitat County.

Inert Landfills and Limited Purpose Landfills

In addition to MSW landfills, two other types of landfills currently exist in the state: inert landfills and limited purpose landfills. These are regulated under chapter 173-350 WAC,

Solid Waste Handling Standards, which took effect in February 2003. The former woodwaste landfill and inert/demolition landfill types no longer exist. Inert waste is narrowly defined for disposal in an inert landfill. Demolition waste will no longer be accepted at an inert landfill. Landfills accepting demolition or wood waste would need to be either limited purpose landfills or MSW landfills. The limited purpose landfill permitted under the new rule has increased design and monitoring requirements.

The annual reporting forms for the inert landfills and limited purpose landfills under chapter 173-350 WAC added more categories of waste. (For detailed reports for the individual inert and limited purpose landfills see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.)

For a more consistent look at inert landfills over time, some waste categories were combined for Table 5.11. (For inert/demolition landfill data from 1992-2003 and inert landfill data for 2004-2005, see http://www.ecy.wa.gov/programs/swfa/solidwastedata/.)

Table 5.11
Waste Types and Amounts Disposed at
Inert / Demolition Landfills (in tons)

WASTE TYPES	1998	1999	2000	2001	2002	2003	2004	2005
Demolition	180,268	173,088	259,255	211,901	243,593	95,008	28,967	39,701
Industrial	-	-	-	-	-	81,474	-	-
Inert	252,506	344,444	180,337	199,256	112,457	163,435	379,298	944,153
Wood	156	336	536	167	445	1,082	2,526	402
Asbestos	4	-	3	3	6	11	-	-
Ash (other than SPI)	-	-	-	-	-	-	-	7,989
PCS	60,545	17,265	34,742	319,105	120,159	131,872	66,260	215,286
Tires	449	414	471	765	257	664	-	-
Other	600	605	2,039	2,646	-	2,668	33,472	324,110
TOTAL (tons)	**494,528**	**536,155**	**477,383**	**733,843**	**476,917**	**476,214**	**509,927**	**1,531,641**

For a more consistent look at limited purpose landfills over time, some waste categories were combined for Table 5.12. (For limited purpose landfill data from 1992-2005, see

Table 5.12
Waste Types and Amounts Disposed at
Limited Purpose Landfills (in tons)

http://www.ecy.wa.gov/programs/swfa/solidwastedata/.)

WASTE TYPES	1998	1999	2000	2001	2002	2003	2004	2005
Demolition	98,072	84,140	71,203	71,817	98,827	68,946	174,519	220,076
Industrial	225,779	262,021	278,224	325,114	282,747	325,863	262,560	420,285
Inert	112,714	136,352	205,902	202,577	195,303	157,431	36,155	53,597
Wood	7,700	8,853	3,205	6,841	2,747	8,420	32266	21,494
Ash (other than SPI)	-	-	-	-	-	-	533,201	409,376
Sludge	-	1,103	-	-	-	-	-	-
Asbestos	1,058	1,549	1,654	1,282	1,311	1,302	1,581	1,624
PCS	56,407	8,837	7,159	13,222	9,888	4,890	20,399	224,064
Soils (uncont)	-	-	-	-	-	-	-	13,706
Tires	559	59	25	41	59	81	713	690
Other	124,607	66,833	79,291	24,698	14,402	19,737	13,708	23,022
TOTAL (tons)	**628,896**	**569,747**	**646,662**	**645,592**	**605,284**	**586,670**	**1,075,102**	**1,387,934**

The woodwaste landfill category no longer exists under chapter 173-350 WAC, *Solid Waste Handling Standards*. (For woodwaste landfill data from 1992-2003 see http://ecy.wa.gov/programs/swfa/solidwastedata/.)

Movement of Solid Waste for Disposal

Movement of Waste Between Counties

All landfills and incinerators report the source, types and amounts of waste they received from out of county. Six of the 16 active MSW landfills reported receiving solid waste from other counties in 2005.

Some of the MSW movement was because of closer proximity to a neighboring county's landfill. This was especially true for the smaller landfills that received MSW from other

counties without their own landfills. Some of the waste from other counties was non-municipal waste such as PCS, demolition debris, and asbestos.

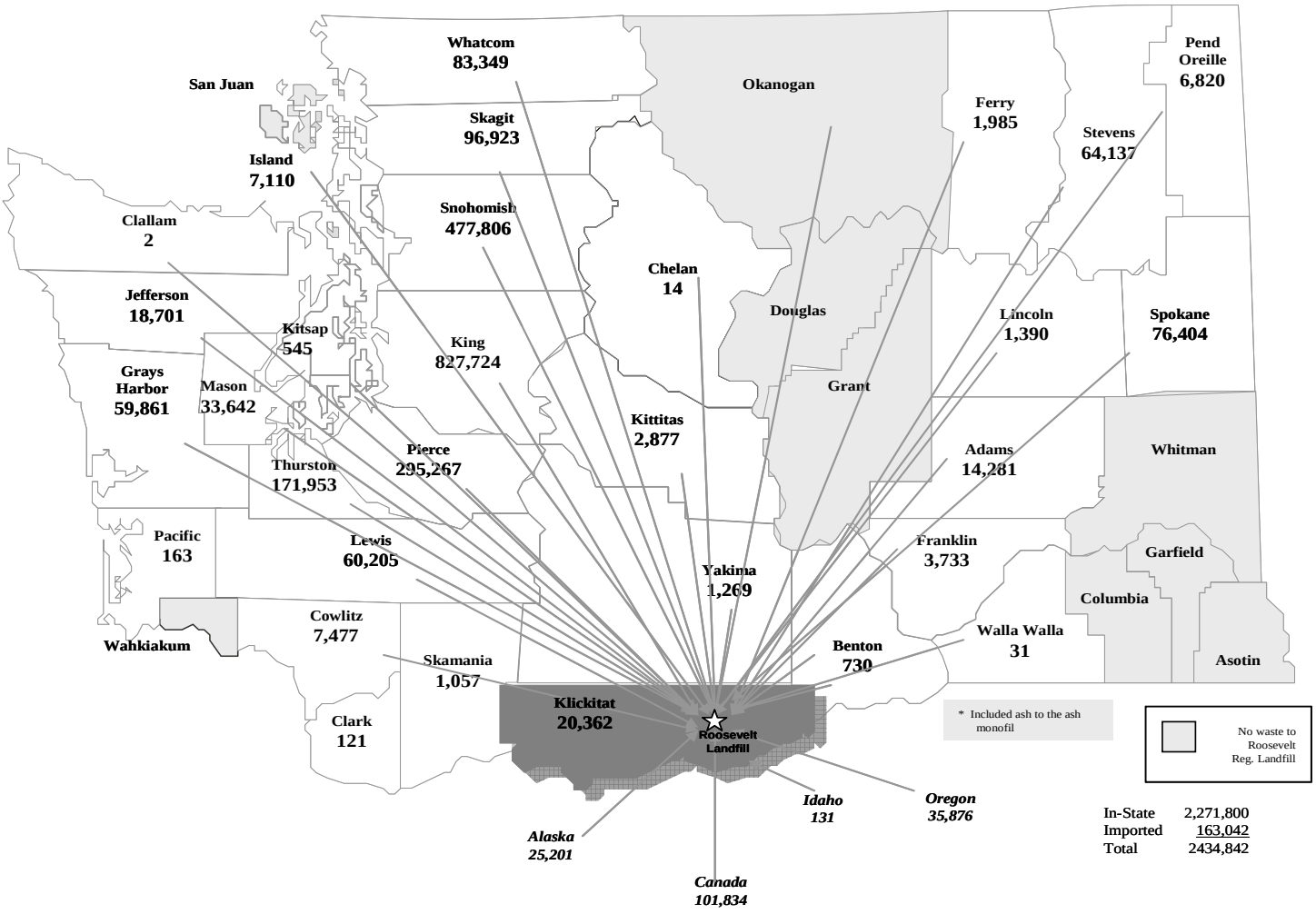
With the closure of many local landfills, Roosevelt Regional Landfill in Klickitat County and Oregon's regional landfills have become the chosen disposal options. The Roosevelt Regional Landfill received some type of solid waste from 29 of the 39 Washington counties and also from out of state and out of country (see Map 5.C). For many counties that still have operating MSW landfills, Roosevelt Regional Landfill has become an option to dispose of some of their non-municipal waste, thus saving local landfill capacity for future need. Nine of the 29 counties rely on Roosevelt for the majority of their MSW disposal, and two other counties send a significant portion of their MSW to Roosevelt.

Nine counties and the City of Seattle send the majority of their MSW to Oregon facilities. Three other counties send a significant amount of waste to Oregon. Much of the waste that goes to the Columbia Ridge Landfill is Oregon is waste other than MSW.

In addition to waste movement to MSW landfills, the Spokane Regional Waste-to-Energy Facility received 1,024 tons of MSW from beyond its home county. Three inert landfills received 250,289 tons of waste and four limited purpose landfills received 75,028 tons of waste from other counties.

You can find spreadsheets that identify the disposal location, type, and amount of waste for each county for 2005 (and previous years) at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

Map 5.C: 2005 Solid Waste to Roosevelt Regional Landfill (in Tons)



Waste Imported from Outside the State

Landfills and incinerators also report the source, types, and amounts of waste received from out of state or out of country. In 2005, a total of 214,858 tons of solid waste, about 2.5 percent of the waste disposed of and incinerated in Washington, was imported from beyond the state's boundaries for disposal at MSW landfills and energy-recovery facilities. The amount of waste imported for disposal decreased from a high of 6 percent in 1996. The termination of a contract between Roosevelt Regional Landfill and a California entity accounted for much of the drop in imported waste.

Table 5.13 shows the types of waste received from out of state for disposal. The majority of this waste (163,042 tons) went to Roosevelt Regional Landfill. Of that, 101,834 tons came from British Columbia, with the remainder from Alaska (25,201 tons), Oregon (25,876 tons), and Idaho (131 tons). Sudbury Road Landfill in Walla Walla County received 94 tons of MSW from Oregon.

Table 5.13
Out-of-State Waste Disposed in Washington

Type of Waste	1991	2002	2003	2004	2005
Municipal Solid Waste	24,475	112,097	77,803	144,396	147,746
Demolition	1,412	6,104	3,824	3,477	2,962
Industrial	-	42,953	30,584	41,171	55,085
Inert	-	1,097	-	59	269
Woodwaste	208	35	28	1	-
Sludge	36	-	621	-	19
Asbestos	-	350	1,245	304	831
Petroleum Contaminated Soils	-	1,769	3,114	7,957	4,801
Tires	-	1.162	5,157	4,694	1,813
Medical	-	-	-	-	-
Other	-	359	508	728	1,332
TOTAL	**26,131**	**165,935**	**122,884**	**202,787**	**214,858**

Nez Perce County, Idaho, disposed of 26,000 tons of MSW in Washington's Asotin County Landfill. Asotin County and Nez Perce County prepared a joint local comprehensive solid waste management plan to meet the requirements of Washington State statute. They have an agreement for joint use of the landfill.

In addition to the MSW landfills, the Spokane Regional Waste-to-Energy Facility received 144 tons of MSW from Idaho. Two limited purpose landfills imported a total of 25,578 tons of waste from Oregon, Idaho, and Montana. Graham Road Recycling and Disposal in Spokane County received 6,009 tons and the Weyerhaeuser limited purpose landfill in Cowlitz County received 19,569 tons. (See http://www.ecy.wa.gov/programs/swfa.solidwastedata/ for imported totals for 1991-2005)

Waste Exported from the State

Another aspect of solid waste movement is the amount exported from Washington to another state for disposal. In 2004, a total of 1,817,665 tons of waste created in Washington was disposed of in Oregon landfills, an increase from 705,608 tons in 1992. Table 5.14 compares the waste amounts and types exported and imported.
(See http://www.ecy.wa.gov/programs/swfa.solidwastedata/ for exported totals for 1993-2005.)

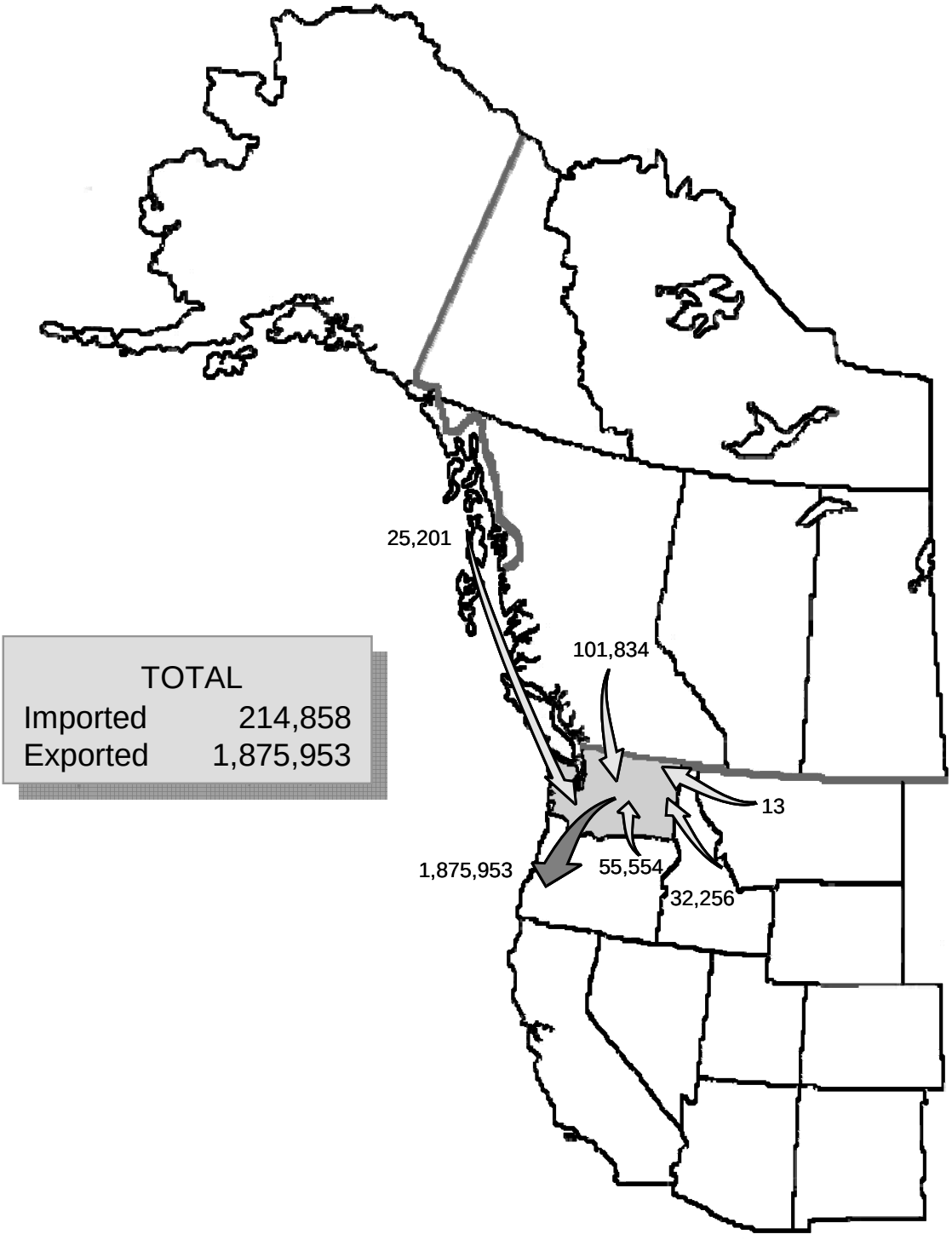
Table 5.14
Comparison of Imported-to-Exported
Waste for all Solid Waste Facilities

TYPE OF WASTE	IMPORTED		EXPORTED	
	1991	2005	1993	2005
Municipal Solid Waste	24,475	147,746	710,515	1,287,506
Demolition	1,412	2,962	2,245	215,765
Industrial	-	55,085	864	102,148
Inert	208	269	-	-
Woodwaste	36	-	-	2,071
Ash (other than SIA)	-	-	-	-
Sludge	-	19	-	-
Asbestos	-	831	1,623	13,215
Petroleum Contaminated Soils	-	4,801	22,308	202,955
Other Contaminated Soils	-	-	-	18,736
Tires	-	1,813	-	16,870
Medical Waste	-	-	-	59
Other	-	1,332	18,512	16,870
TOTAL	**26,131**	**214,858**	**756,067**	**1,875,953**

Major exporters of MSW in Washington included the City of Seattle, Columbia County, Clark County, Franklin County, Island County, Kitsap County, Pacific County, San Juan County, Skamania County, and Whitman County, along with portions of Benton County, Franklin County, Kitsap County, Snohomish County, and Whatcom County. Reasons for exporting out of state have to do with the closure of local landfills and the negotiation of favorable long-haul contracts.

In addition to reports from MSW landfills in Oregon, waste tire data gathered through the recycling survey showed 16,582 tons of tires were disposed in Oregon. This disposal has occurred over the lasts several years but the tonnage was not included until the 2005 report. Additional tires are disposed in Montana but the information has not been available to us.

Map 5.D: Imported and Exported Waste (2005)

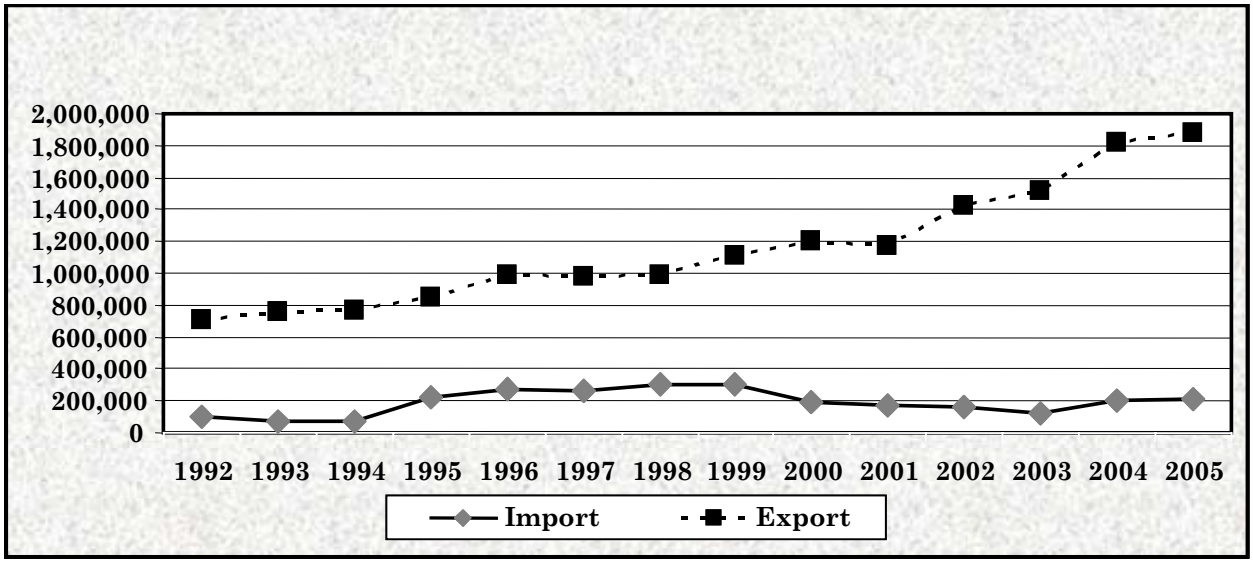


Trends in Interstate Waste Movement for Washington

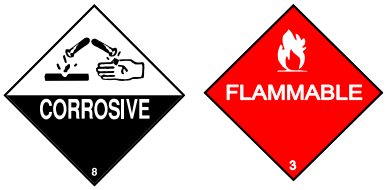
The first significant movement of waste across Washington State boundaries started in 1991. In mid-1991, the City of Seattle started long-hauling waste to the Columbia Ridge Landfill in Arlington, Oregon. In late 1991, the Roosevelt Regional Landfill began operating in Klickitat County, Washington, accepting waste from British Columbia, Idaho, and California. Map 5.D identifies the sources and amounts of waste that were imported and exported in 2005.

As can be seen in Figure 5.9, Washington exports have been much higher than imports since 1991. With the loss of the California contract at Roosevelt Regional Landfill, waste imports dropped from a high of 307,850 in 1998, to 214,858 tons in 2005. Exported waste amounts increased in 2005, with almost nine times as much waste being exported to Oregon's landfills (Columbia Ridge, Wasco, and Finley Buttes) as is imported to Washington for incineration or disposal.

Figure 5.9
Trend of Imported/Exported Solid Waste



Chapter VI
Moderate Risk Waste Management



The term "moderate risk waste" (MRW) was created by revisions to Washington State's 1986 Hazardous Waste Management Act (RCW 70.105). MRW is a combination of household hazardous waste (HHW) and conditionally exempt small quantity generator (CESQG) waste. HHW is waste created in the home, while CESQG is small quantities of business or non-household waste. Both HHW and CESQG waste are exempt from hazardous waste regulations.

- *Total MRW collection in 2005 was over 32 million pounds.*
- *The average amount of HHW disposed of per participant was 76.09 pounds, and per capita was 2.68 pounds.*
- *Over 3.5 % of Washington residents used a fixed facility or collection event to remove hazardous waste from their household, about nine percent of all households.*
- *The counties that collected the most CESQG waste per capita were Yakima, San Juan, Whatcom, Cowlitz, and Chelan.*
- *The counties that collected the most used oil per capita were Mason, Garfield, Island, Stevens, Skamania, and Yakima.*
- *The ten categories of collected waste that increased the most from 2004 are Reactives, Pesticide/Poison Solids, Other, Flammable Liquid Poison (aerosols), Chlorinated Solvents, CRTs, Electronics, Oil w/ PCB's, Oil w/ chlorides, and Bases (aerosols).*
- *84% of all HHW collected was recycled, reused, or used for energy recovery.*

MRW collections started in the early 1980's primarily as HHW-only events, also known as "round-ups."

These events usually happened once or twice a year. In the late 1980's permanent collection facilities, now known as fixed facilities, began to replace the collection events in order to fulfill the need for year-round collection. In addition, collection facilities have further developed with mobile units, satellite facilities, and tailgate events. These efforts resulted in a larger number of customers served, decreased costs, and increased reuse and recycling of MRW.

It should be noted the data in this chapter are only a portion of the MRW waste stream. The MRW data presented here is reported through local governments. *Chapter V Solid Waste Generation, Disposal and Recycling in Washington State* includes additional data statewide.

Funding

Washington State's *chapter 70.105D RCW, Hazardous Waste Cleanup - Model Toxics Control Act* provides a large part of the funding for public MRW programs, carried out through the Coordinated Prevention Grant program. Many jurisdictions use funds to plan and carry out local MRW programs.

In 1985, the Legislature amended the *Hazardous Waste Management Act, chapter 70.105 RCW*, to require local governments, or a combination of neighboring local governments, to prepare plans to manage moderate risk waste (MRW). By 1991, all local governments had submitted local hazardous waste plans. Every local hazardous waste plan includes parts on MRW public education, MRW enforcement, household hazardous waste (HHW) collection, and technical and disposal assistance to conditionally exempt small quantity generators (CESQGs).

Annual Reporting

Ecology requires local programs to submit MRW report forms annually. For the past few years, Ecology has requested annual reports be submitted by March for the previous calendar year collections. The information received from local programs through the MRW annual reports provides Ecology with data on MRW infrastructure, collection trends, costs, and waste types received at collection events and fixed facilities. Ecology translates this data into the information contained in this chapter and designs it to be specifically useful to those who operate or work MRW programs within Washington State.

Accuracy of Data Collection

Ecology created and sends out a standard reporting form to all MRW programs. The reported data can vary depending on a program's collection process and how data is reported and interpreted. All programs must provide individual MRW reports.

2004 – Some reporting errors have been identified since the 2004 report numbers were published. The 2004 HHW numbers and consequently the overall MRW number for 2004 have changed dramatically. One facility over reported the total amount of latex paint collected by 3 million pounds. Another facility reported the total amount of HHW that came to its facility from all sources (versus the facilities county of residence) in 2004. This same facility, because of this reporting confusion and a contract change, saw its HHW number go from 4,068,503 pounds collected in 2004 to 4,395 pounds collected in 2005. The actual number for 2004 is impossible to know for what was collected in the county it resides. These two reporting anomalies account for upwards of 7 million pounds over reported in 2004 in the HHW and overall MRW categories.[26]

2005 - Columbia County did not report their used oil collections so the number from the previous year was carried over.

[26] See Table 6.2 for a year by year breakdown of HHW, CESQG, and overall MRW pounds collected back to 1999. By accounting for the reporting confusion mentioned above, the numbers are more in line with overall collection trends and explain the large jump seen from 2003 to 2004.

Lincoln County has limited quantities and has stored their MRW. They have just submitted HHW quantities, participation numbers, and costs from the past three years. This data was averaged over the time period to establish the numbers for 2005. In addition, Klickitat County's participation numbers seem high but the county could not confirm this for us.

One facility in King County reported all CESQG waste received at its facility from all Washington State counties it services for CESQG collections. These numbers were easily backed out of the King County total based on other annual reports submitted to Ecology.

Year 2005 Data

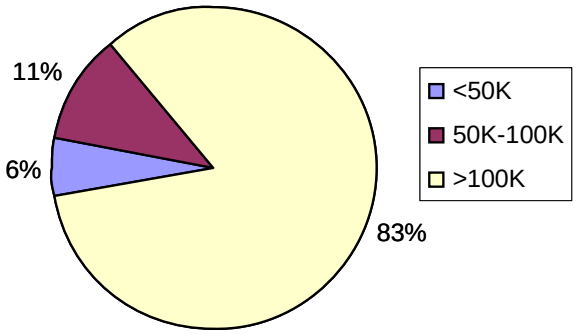
This year's report focuses on 2005 data with some comparisons to previous years' data. To provide useful information for individual programs, data is presented in categories by county size.

Figure 6.1 and Table 6.1 indicates a distinction between counties with a population of less than 50 thousand, of 50 to 100 thousand, and of more than 100 thousand.

In Washington State there are 42 programs that manage MRW. These programs include all 39 counties. Agencies located in King County produce four reports:

- King County Waste Mobile and Used Oil Collection System
- Seattle Solid Waste Utility (HHW)
- Port of Seattle (HHW)
- Seattle City Light (CESQG)

Figure 6.1
Percent of State Population by County Size



Many HHW collection systems are approaching stability. Permanent fixed facilities now service most of the state. Only Chelan, Clallam, Douglas, Ferry, Garfield, Grant, Skamania, and Wahkiakum counties do not have fixed facilities. San Juan County had a fixed facility, but had to close in June 2005. Garfield residents use the facility in Asotin County and Cowlitz County conducts a mobile unit in Wahkiakum County. Clallam, Chelan, Douglas, Grant, and Skamania counties conduct collection events but may convert to fixed facilities in the future. The City of Port Angeles opened a new facility early in 2007, to serve Clallam County residents. Also, Stevens County is planning on adding another facility and Mason County is looking to expand its current facility.

Collection services for CESQGs continue to expand statewide. For 2005, 19 fixed facilities and 4 collection events were providing collection services for CESQGs.

Table 6.1
Individual County Population by Size

<50K	
Adams	17,000
Asotin	20,900
Columbia	4,100
Douglas	34,700
Ferry	7,400
Garfield	2,400
Jefferson	27,600
Kittitas	36,600
Klickitat	19,500
Lincoln	10,100
Okanogan	39,600
Pacific	21,300
Pend Oreille	12,200
San Juan	15,500
Skamania	10,300
Stevens	41,200
Wahkiakum	3,900
Whitman	42,400
<50K total	**366,700**

50K-100K	
Chelan	69,200
Clallam	66,800
Cowlitz	95,900
Franklin	60,500
Grant	79,100
Grays Harbor	69,800
Island	76,000
Lewis	71,600
Mason	51,900
Walla Walla	57,500
50K-100K total	**698,300**

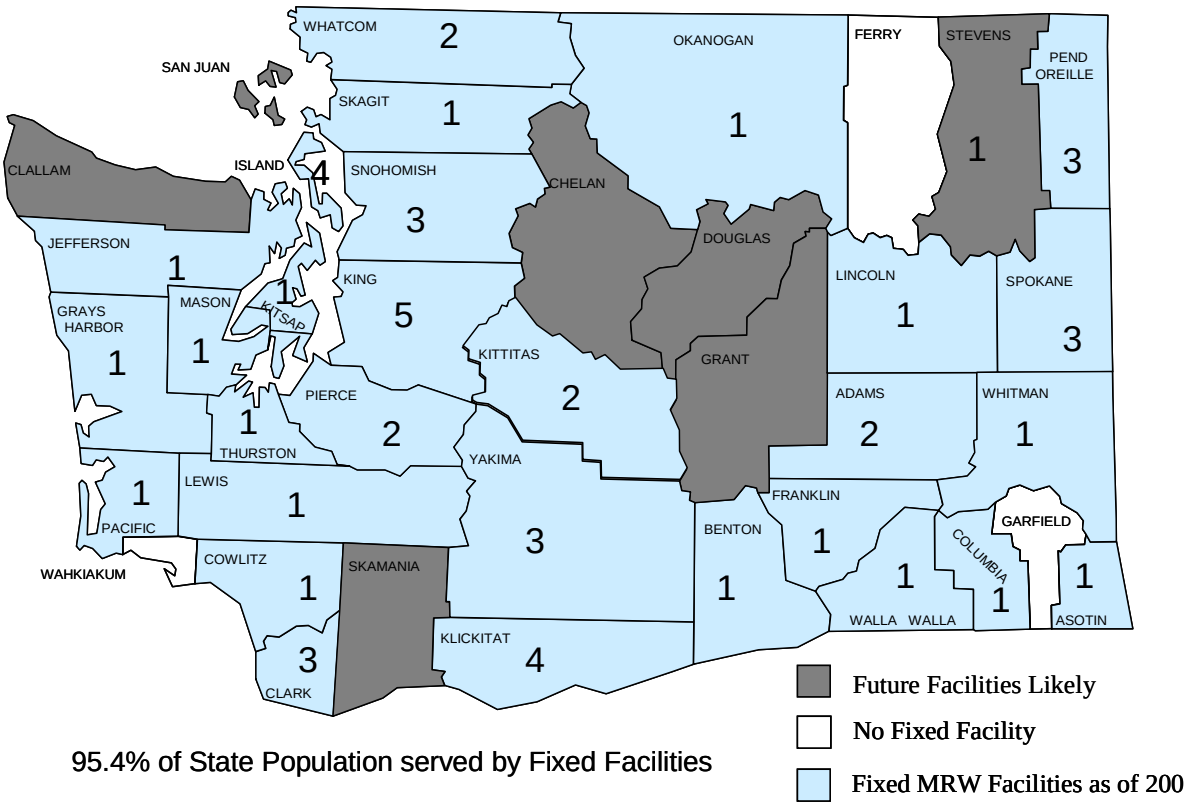
>100K	
Benton	158,100
Clark	391,500
King *	1,235,300
Kitsap	240,400
Pierce	755,900
Skagit	110,900
Snohomish	655,800
Spokane	436,300
Thurston	224,100
Whatcom	180,800
Yakima	229,300
Seattle *	573,000
>100K total	**5,191,400**

*** King excludes Seattle**

State Total 6,256,400

Figure 6.2 shows which counties have permanent facilities, the number of facilities in each county, and which counties are likely to develop a permanent facility in the future.

Figure 6.2
54 MRW Facilities as of 2005



95.4% of State Population served by Fixed Facilities

MRW Collected

As shown in Table 6.2, Washington collected approximately 14.7 million pounds of HHW, 11.3 million pounds of used oil (UO) from collection sites (includes antifreeze and oil filters), and 6.3 million pounds of CESQG waste, for a total of over 32 million pounds of MRW during 2005. Most significant is the increase of CESQG waste collected. This is largely due to more focused efforts at collecting CESQG wastes by the King County Local Hazardous Waste Program and Tacoma/Pierce County Health Department. In general, the increases seen in collection totals are attributed to increased collections at the Phillip Services (Kent Facility) in King County and the Emerald Services facility in Pierce County.

Table 6.2
Total Pounds per Waste Category
Years 1999 - 2005

Collection Year	HHW lbs (no UO)	Used Oil lbs	CESQG lbs	Total MRW lbs
1999	9.9M	9.3M	637K	20.4M
2000	10.5M	8.3M	1.1M	19.8M
2001	15.6M	11.3M	1.0M	27.9M
2002	13.5M	9.2M	1.4M	24.1M
2003	16.0M	11.7M	1.3M	29.0M
2004	15.3M*	12.4M	2.4M	30.1M*
2005	14.7M	11.3M	6.3M	32.3M

* An estimated 7 million pounds of HHW was over reported in 2004. These numbers reflect a change from 2004 data reported in last year's report.

Collection by Waste Category and Type

As shown in Table 6.3, the dominant types of MRW collected in 2005 were non-contaminated used oil, latex and oil-based paint, lead-acid batteries, antifreeze, and flammable liquids. These totals include used oil and antifreeze from all collection sites. These six specific waste types accounted for 74 percent of the estimated 32 million pounds of MRW collected in 2005.

Table 6.3
Six Most Dominant MRW Waste Types Collected in 2005

Waste Type	Total Lbs.
Non-Contaminated Used Oil	10,715,376
Latex Paint	4,392,771
Oil-based Paint	3,272,514
Lead-Acid Batteries	1,954,582
Antifreeze	1,885,479
Flammable Liquids	1,715,235
TOTAL	**23,935,957**

Table 6.4 provides summary information on total pounds of MRW collected from HHW and CESQG categories by waste types.

Table 6.4
Total Pounds of MRW Collected by Waste Category

WASTE TYPE	HHW	CESQG	TOTAL
Acids	166,027.50	18,057.00	184,084.50
Acids (aerosol cans)	109.00	0.00	109.00
Antifreeze	602,547.00	925,570.00	1,528,117.00
Antifreeze Off-site*	0.00	357,362.00	357,362.00
Bases	163,249.00	13,559.00	176,808.00
Bases, Aerosols	3,978.00	0.00	3,978.00
Batteries (lead acid)	1,936,453.00	18,129.00	1,954,582.00
Batteries (small lead acid)	9,229.00	11,405.00	20,634.00
Batteries (dry cell)	251,656.00	6,171.00	257,827.00
Batteries (nicad/NIMH/lithium	26,186.00	6,219.00	32,405.00
Electronics	604,737.00	40,742.00	645,479.00
CRT's	704,243.00	84,175.00	788,418.00
Chlorinated Solvents	8,264.00	11,862.00	20,126.00
Flammable Solids	36,647.00	24,135.00	60,782.00
Flammable Liquids	886,607.50	828,628.00	1,715,235.50
Flammable Liquids, Aerosols	21,914.00	4,199.60	26,113.60
Flammable Liquids Poison	102,238.00	3,620.00	105,858.00
Flammable Liquid Poison, Aerosols	21,483.00	3,994.00	25,477.00
Flammable Gas (butane/propane)	185,791.00	30,474	216,265.00
Flammable Gas Poison	2,260.00	11.00	2,271.00
Flammable Gas Poison, Aerosols	61,594.00	3,807.00	65,401.00
Latex Paint	4,308,970.60	103,801.20	4,412,771.80
Latex Paint, Contaminated	877,995.00	20,942.00	898,937.00
Mercury (pure)	669.00	598.50	1,267.50
Mercury (switches)	42.33	15.11	57.44
Mercury (fluorescent lamps)	2.13	1.68	3.81
Oil-Based Paint	3,064,407.10	208,107.20	3,272,514.30
Oil-Based Paint, Contaminated	14,692.00	34,270.00	48,962.00
Oil Contaminated	91,700.00	86,855.00	178,555.00
Oil Filters	56,757.40	46,479.00	103,236.40
Oil Filters Off-site*	0.00	61,692.00	61,692.00
Oil Filters Crushed	379.00	19,727.00	20,106.00
Oil Non-Contaminated	1,602,574.00	257,599.00	1,860,173.00

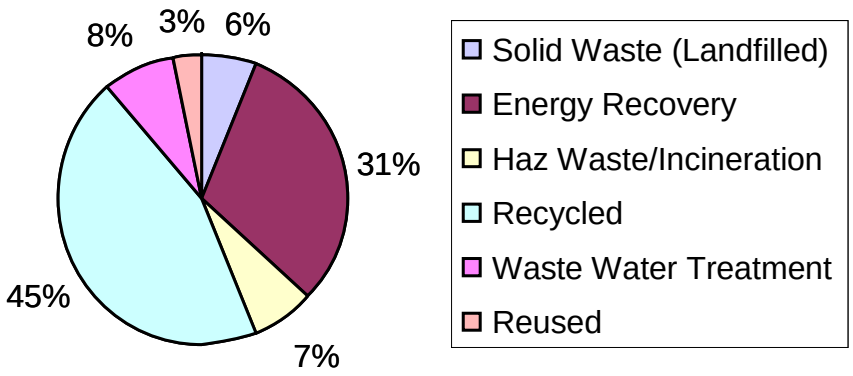
WASTE TYPE	HHW	CESQG	TOTAL
Oil Non-Contaminated Off-site *	0.00	8,855,203.00	8,855,203.00
Oil with Chlorides	2,820.00	338.00	3,158.00
Oil with PCBs	10,044.00	10,843.00	20,887.00
Other Dangerous Waste	240,058.60	3,475,652.00	3,715,710.60
Organic Peroxides	1,279.00	542.00	1,821.00
Oxidizers	53,231.60	717.00	53,948.60
Pesticide / Poison Liquid	336,701.80	10,529.00	347,230.80
Pesticide / Poison Solid	237,898.90	8,582.00	246,480.90
Reactives	60,557.00	201.00	60,758.00
MRW TOTAL	**16,755,992.46**	**15,594,814.29**	**32,350,806.75**

* Used oil collection sites other than a collection facility or event

Disposition of MRW Waste

MRW is generally well managed. Most MRW is recycled or used for energy recovery. Very little is safe for solid waste disposal and seven percent of all MRW is disposed of at a hazardous waste landfill or incinerator. See Figure 6.3 for final disposition of MRW between recycled, reused, energy recovery, hazardous waste landfill or incineration, solid waste landfill, and disposal through a waste water treatment plant.

Figure 6.3
MRW Final Disposition



MRW Data

Table 6.5 shows various data by county. This information can be used to evaluate efficiencies within each county by comparing percentage of participants per housing units and costs and HHW pounds per participant. Housing units are the number of households in each county. This data is used instead of per capita because participants typically represent a household.

Table 6.5
Various Data by County

COUNTY	HOUSING UNITS	HHW Participants	% Participant / Housing Units	HHW Cost / Participant	HHW lbs / Participant	HHW Total lbs	HHW, SQG, & Used Oil Total lbs
Adams	6,211	362	5.8%	$46.96	22.21	8,040.02	59,833.02
Asotin	9,509	1,065	11.2%	$57.63	90.82	96,720.08	103,275.58
Benton	62,897	5,921	9.4%	$31.85	77.52	458,994.02	505,779.84
Chelan	32,467	710	2.2%	$123.43	115.62	82,090.00	193,080.01
Clallam	33,048	993	3%	$91.90	103.16	102,436.00	302,227.00
Clark	156,219	11,931	7.6%	$28.17	106.43	1,269,838.09	1,435,817.09
Columbia	2,134	9	.4%	$82.33	92.67	834.00	8974.00*
Cowlitz	41,160	1,585	3.9%	$51.93	159.46	252,742.00	679,127.00
Douglas	14,047	433	3.1%	$63.38	153.78	66,586.00	126,930.00
Ferry	3,977	24	.6%	$22.50	29.29	703.00	2,224.00
Franklin	20,313	123	.6%	$35.72	178.84	21,996.90	194,246.90
Garfield	1,303	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin	Inc. w/ Asotin
Grant	31,453	649	2.1%	$93.72	207.70	134,795.16	156,672.16
Grays Harbor	34,088	1,624	4.8%	$101.77	66.18	107,474.70	304,188.71
Island	36,204	2,594	7.2%	$67.96	161.38	418,630.16	648,261.18
Jefferson	15,644	1,104	7.1%	$57.82	37.18	41,042.32	112,087.34
King	509,127	53,072	10.3%	$61.80	75.54	4,008,965.58	9,849,267.90
Seattle	285,532	17,159	6%	$71.21	76.70	1,315,921.00	1,315,921.00
Kitsap	99,298	6,837	6.9%	$114.21	98.58	673,980.47	1,179,406.33
Kittitas	18,156	769	4.2%	$78.79	92.92	71,455.00	208,483.00
Klickitat	9,504	8,888	93.5%	$3.97	8.72	77,526.00	121,999.00
Lewis	32,013	1,665	5.2%	$47.34	111	184,742.18	348,060.18
Lincoln	5,581	200	3.6%	$20.45	25.33	5,065.00	9,164.67^
Mason	28,107	4,159	14.8%	$26.57	23.40	97,310.02	899,801.02

COUNTY	HOUSING UNITS	HHW Participants	% Participant / Housing Units	HHW Cost / Participant	HHW lbs / Participant	HHW Total lbs	HHW, SQG, & Used Oil Total lbs
Okanogan	20,177	205	1%	$181.84	91.17	18,690.00	56,208.00
Pacific	14,608	165	1.1%	CNR	110.38	18,212.00	90,406.00
Pend Oreille	7,144	2,000	28%	$55.31	33.07	66,140.20	66,140.20
Pierce	305,957	10,152	3.3%	$45.91	70.85	719,310.10	2,597,991.28
San Juan	10,970	271	2.5%	$232.19	219.15	59,389.58	105,150.58
Skagit	46,450	3,450	7.4%	$24.20	89.22	307,793.14	394,815.14
Skamania	5,084	207	4.1%	$76.02	94.50	19,560.00	66,520.00
Snohomish	262,424	18,278	7%	$22.18	108.58	1,984,554.80	3,390,666.97
Spokane	186,670	38,390	20.6%	$6.02	51.21	1,966,082.66	2,657,972.60
Stevens	18,907	424	2.2%	$86.98	182.75	77,486.10	306,796.10
Thurston	96,310	10,615	11%	$57.13	114.22	1,212,424.37	1,612,053.44
Wahkiakum	1,931	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz	Inc. w/ Cowlitz
Walla Walla	22,566	1,930	8.6%	$68.01	51.47	99,340.00	167,869.00
Whatcom	82,742	6,151	7.4%	$34.00	49.46	304,198.06	497,681.44
Whitman	17,704	3,294	18.6%	$12.46	11.04	36,370.50	59,393.50
Yakima	82,748	1,609	1.9%	$183.44	173.03	278,411.31	1,516,315.77
STATEWIDE	**2,670,384**	**219,017**	**8.20%**	**N/A**	**76.09**	**16,665,850.52**	**32,350,806.75**

* Used Oil Total from previous year used
^ County submitted totals from last three years, so the 3 year average was used to determine the 2005 number.

Household Hazardous Waste (HHW)

Participants per Housing Unit

Counties that exhibit 10 percent or higher participants per housing unit are either performing excellent public education to encourage the use of facilities or events, have very convenient locations for their collection facilities, or both. The participation number and rate for Klickitat County seems high but the county could not confirm this for us.

Cost per Participant

This statistic is hard to compare because of the many variables in program costs. Some programs record every cost, whether direct or indirect. Others record only the disposal and basic operation costs. Larger counties have the advantage of efficiency of scale both in quantities received and in disposition options. Also, there are differences in service levels of the basic program, accounting differences, and errors. This data does, however, provide an idea of what is possible and an incentive to contact those counties that appear to operate efficiently.

HHW Pounds per Participant

The average pounds collected statewide per participant for HHW was just over 76. Table 6.6 shows the top five counties with the highest collections of HHW in pounds per capita (not participant) for 2003, 2004, and 2005. It is noteworthy that in 2004 both King and Snohomish counties have large collection numbers per capita. In 2004 Pacific County collected 292,093 pounds of HHW with only 180 participants, which comes to an average of 1,623 pounds per participant, or 13.75 pounds per capita. This number seems high, and Ecology could not verify it.

Table 6.6
High Collections of HHW (no Used Oil Sites) Pounds per Capita by County in 2003-2005

HHW 2003		
County	**Size**	**Lbs./ Capita**
Thurston	>100K	**17.65**
Kittitas	<50K	**12.18**
Whatcom	>100K	**5.21**
Klickitat	<50K	**4.51**
Cowlitz/ Skagit	>50K & >100K	**4.44**

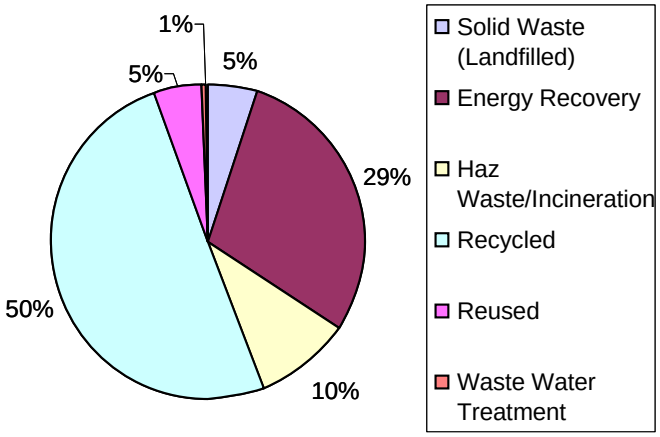
HHW 2004		
County	**Size**	**Lbs./ Capita**
Pacific	<50K	**13.75**
King	<100K	**9.39**
Kittitas	<50K	**6.49**
Snohomish	<100K	**6.20**
Asotin	<50K	**4.45**

HHW 2005		
County	**Size**	**Lbs./ Capita**
Island	50-100K	**5.51**
Pend Oreille	<50K	**5.42**
Thurston	>100 K	**5.41**
Asotin	<50K	**4.63**
Spokane	>100 K	**4.51**

HHW Disposition

Figure 6.4 shows the final disposition of all HHW collected throughout Washington State.

Figure 6.4
HHW Final Disposition



Conditionally Exempt Small Quantity Generator (CESQG)

Twenty-two local MRW programs collect CESQG waste from the public. Counties that sponsor CESQG waste collections are:

Asotin	Grant	Jefferson	Thurston
Benton	Grays Harbor	King	Whatcom
Chelan	Island	Lewis	Yakima
Clallam	Jefferson	Okanogan	
Clark	King	San Juan	
Cowlitz	Kitsap	Skagit	
Douglas	Kittitas	Snohomish	

Yakima County was responsible for over 49 percent of the total statewide volume of publicly collected CESQG waste. This is largely due to Yakima County's policy of not charging businesses to dispose of or recycle their waste. This does not take into account the amounts of CESQG waste collected privately.

Also included in CESQG waste totals for year 2005 are data from Emerald and Philip Services (private collections). These types of collections by-pass the public system with each company servicing small businesses directly. Emerald Services primarily serves Pierce County and Philip Services primarily serves King, Pierce, and Clark counties. Factoring in the privately collected totals from Emerald and Phillip Services, King and Pierce counties

would move to the top of the below list of the top five counties collecting CESQG waste per capita.

The top five counties that collected the most CESQG material per capita were:

Yakima **San Juan** **Whatcom** **Cowlitz** **Chelan**

As shown in Table 6.7 (discounting the waste type "Other"), the dominant four types of CESQG waste collected in 2005 were antifreeze, flammable liquids, used oil (non-contaminated), and oil-based paint.

Table 6.7
CESQG by Waste Type Collected in 2005 (top 25 types)

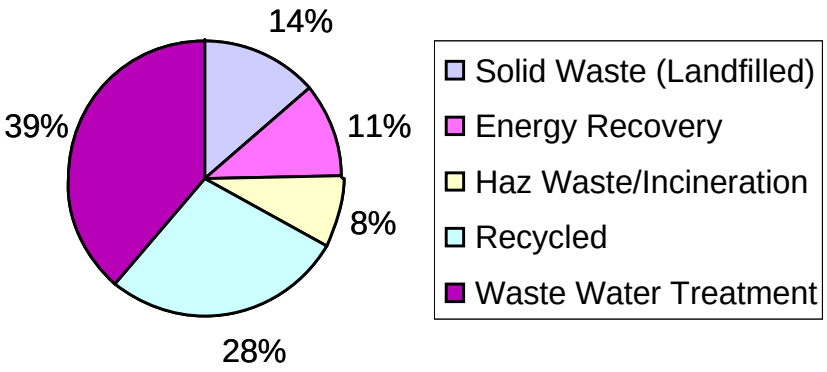
Waste Type	Total lbs. CESQG
Antifreeze	925,570
Flammable Liquids	828,628
Used Oil (non-contaminated)	257,599
Oil-based Paint	208,107
Latex Paint	103,801
Used Oil (contaminated)	86,855
CRT's	84,175
Oil Filters	46,479
Electronics	40,742
Oil-based Paint (contaminated)	34,270
Flammable Gas (butane/propane)	30,474
Flammable Solids	24,135
Latex Paint (contaminated)	20,942

Waste Type	Total lbs. CESQG
Oil Filters (crushed)	19,727
Batteries (lead acid)	18,129
Acids	18,057
Bases	13,559
Chlorinated Solvents	11,862
Batteries (small lead acid)	11,405
PCB oils	10,843
Pesticide Poison Liquid	10,529
Pesticide Poison Solid	8,582
Batteries (nicad/NIMH/lithium)	6,219
Batteries (dry cell)	6,171
Flammable Liquids (aerosols)	4,199
All Other	3,489,498
TOTALS	**6,320,557**

CESQG Disposition

Thirty-nine percent of all CESQG moderate risk waste was either recycled or used for energy recovery. See Figure 6.5 for the complete disposition of CESQG wastes. The biggest difference between final dispositions of HHW and CESQG wastes lie in the amount of waste sent to a waste water treatment plant. Another thirty-nine percent was treated and disposed of through a waste water treatment plant, while one percent of HHW was disposed of via the same method. This number increased significantly from previous years due to the 2.5 million pounds of "other MRW waste" disposed of via a water treatment plant processed through Phillip Services Kent Facility.

Figure 6.5
CESQG Final Disposition



Used Oil Sites

In 2005, facilities and collection sites reported collecting a total of 10,893,931 pounds of used oil (contaminated – 2% and non-contaminated – 98%). Used oil collection by county population is starting to show consistency with the top producers over the last few years. Table 6.8 lists the six counties with the highest collections in pounds per capita by county size for 2003, 2004, and 2005.

Table 6.8
Used–Oil High Collection Counties
Pounds per capita by county size collected at facilities and used oil collection sites

Used Oil Sites - 2003		
County	**Size**	**Lbs./ Capita**
Columbia	<50K	17.6
Mason	50K-100K	11.9
Skamania	<50K	5.6
San Juan	<50K	4.9
Stevens	<50K	3.8
Pacific	<50K	3.8

Used Oil Sites - 2004		
County	**Size**	**Lbs./ Capita**
Mason	50K-100K	**13.0**
Yakima	>100K	**4.9**
Skamania	<50K	**4.7**
Kittitas	50K-100K	**4.2**
Stevens	<50K	**4.0**
Cowlitz	50K-100K	**3.6**

Used Oil Sites - 2005		
County	**Size**	**Lbs./ Capita**
Mason	50K-100K	**13.83**
Garfield	<50K	**8.33**
Island	50K-100K	**5.36**
Stevens	<50K	**5.34**
Skamania	<50K	**4.56**
Yakima	>100K	**4.16**

Statewide Level of Service

The Washington State Office of Financial Management reported that as of 2005, Washington State had an estimated 2,670,384 housing units[27]. MRW Annual Reports indicated there were 219,017 participants. The actual number of households served is larger due to the fact that most used oil sites do not record or report numbers of participants. (Spokane is the

[27] This information was downloaded from Web site http://ww.ofm.wa.gov/

exception.) The actual number of households served is also larger because some participants counted at events or by facilities bring HHW from multiple households.

One way to estimate the approximate number of households served is to add 10 percent to the participant values. This method gives an estimate of 240,918 participants served in 2005. This number represents 9 percent of all households in Washington State. Table 6.9 shows the percent of participants served statewide since 2001.

Table 6.9
Percent of Participants Served Statewide

Year	Percent Participants Served
2001	6.1
2002	6.8
2003	8.9
2004	8.9
2005	9.0

Trends in Collection

As fixed facilities continue to gain popularity, the number of collection events is decreasing. Some programs are eliminating collection events altogether or using hybrid mobile collection systems. Reasons for this shift include:

- Increased cost of collection events per amount of waste collected.
- Fixed facilities providing a sense of permanence and normality to the collection of MRW.
- Increased operation efficiencies with fixed facilities (including the option of having an efficient location to conduct a collection service for CESQGs).

New Waste Streams

MRW collection programs are well established statewide. Although the 2005 annual reports did not identify any new waste types, "Other Dangerous Waste" has grown to the fourth largest waste type. This indicates a need to identify what wastes are not fitting into the established categories of the report. New waste types may be identified and added to future annual reports.

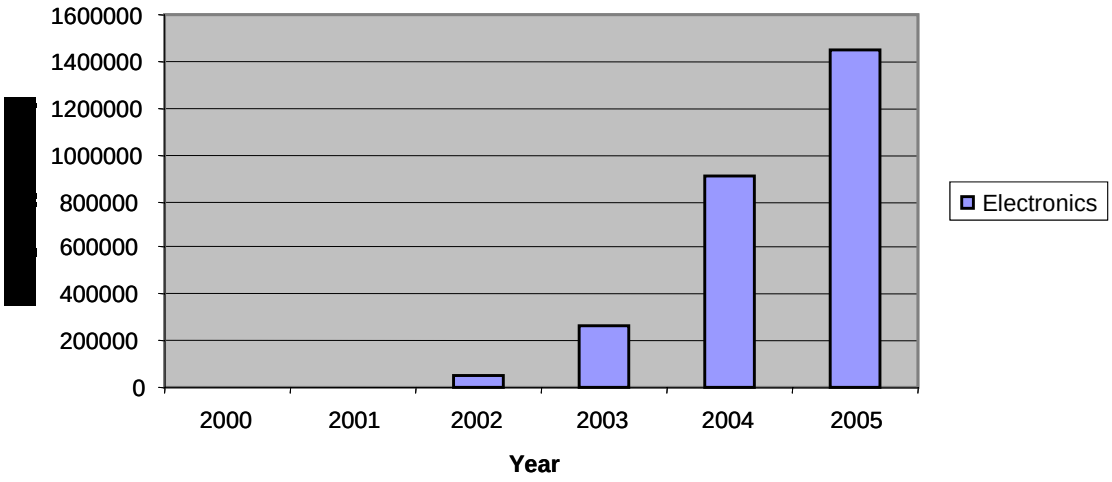
Used electronics continues to be an area of concern. Components in a number of electrical and electronic products contain one or more of the following substances: mercury, lead, cadmium, embedded batteries, and polychlorinated biphenyls (PCBs).

Improved technology leads to better electronic products. And as more people can afford to obtain these popular products, disposal of the leftovers, as well as their components, becomes a concern for Ecology and local solid waste managers. For example, in the European Union an

estimated four percent of their municipal solid waste stream is electronics, other electrical devices, and appliances, as of 1999.

Ecology began collecting data on this waste stream in 2001, and in one year (2002 vs. 2003) it more than doubled. In 2004 it has more than tripled over 2003 totals. 2005 saw a 59 percent increase over 2004 collections (see Figure 6.6). As in 2004, the 2005 report shows a significant shift of electronic and CRT collection; more comes from households versus businesses, as reported in 2003. We expect this waste stream to increase as the public becomes more aware of this waste type. Also, the recently passed electronics recycling bill should ease the burden of this high volume/high cost waste for local governments once it is up and operating by January 2009. (See *Chapter I Issues Facing Solid Waste* for more details about the electronics recycling bill.)

Figure 6.6
Electronics Collection Trends
(HHW, CESQG and Collection Events)



Appendix A
Municipal Solid Waste (MSW) Generation, Recycling & Disposal

The discussion of the solid waste generation, disposal, recycling and diversion totals in Chapter V includes **all** types of waste disposed of, composted materials, source-separated materials burned for energy, and non-municipal solid waste (MSW) diverted from disposal. The following discussion is of the more "traditional" recycling, disposal and generation numbers that are made up of **only the municipal solid waste stream**.

In 1989, the Legislature amended the *Solid Waste Management Act* (chapter 70.95 RCW). The law set a state recycling goal of 50 percent, to be achieved by 1995. The 50 percent rate set by the legislature refers to the MSW recycling rate. To determine this rate, and assure that it is consistent and comparable with past years, Ecology has measured a very specific part of the solid waste stream since 1986. It is roughly the part of the waste stream defined as municipal solid waste (MSW) by the Environmental Protection Agency.[28]

The law also states that recycling should be at least as affordable and convenient to citizens as garbage disposal. In response, local governments began putting in place various forms of recycling. These efforts ranged from drop boxes to curbside collection of a variety of recyclable materials.

In 2005, there were 164 cities and county unincorporated areas offering curbside collection of recyclable materials such as glass, paper, and metals. At the same time, 122 of those cities and county unincorporated areas (74 percent of those 164) offered curbside collection of yard waste. The availability of recycling collection programs in the commercial sector (both publicly and privately operated) is also increasing, and the amount of materials these programs collect far outweighs what is collected in the residential sector.

Despite all the efforts citizens, government, and industry have made, the state did not reach the 50 percent goal by 1995. In 2002, the Legislature amended the law, giving the state until 2007 to reach the goal. The legislators also set a state goal to establish programs to eliminate yard waste in landfills by 2012.

In 1999, Ecology began to expand what it measures to include materials outside of the state's definition of municipal recycling, with the "solid waste diversion" measure (see Chapter V for a complete discussion on solid waste diversion). However, Ecology continues to measure progress on the narrower MSW recycling, since this is as an important area for municipal

[28] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes durable goods, nondurable goods, containers and packaging, food wastes, and yard trimmings. It does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition, and landclearing debris disposed of at municipal solid waste landfills and incinerators.

governments and industry assessing progress on programs that are targeted toward changing residents and businesses disposal practices.

MSW recycling is measured by identifying the MSW materials recycled and dividing that by the total MSW generation (recycling plus disposal). Landfills and incinerators are requested to report MSW separately, by county of origin, which makes arriving at the denominator relatively simple. Landfills are not required, however, to report the contents of the MSW. This information would have to be arrived at through a sampling study, or waste composition study. Using updated waste composition data, Ecology would be able to determine individual material recycling rates. This information would be useful in local and state planning, as well as useful for industry.

Recycling Rates for MSW

Each year since 1986, Ecology has conducted a survey to measure the statewide recycling rate for municipal solid waste. Information comes from local governments, haulers, recyclers, brokers, and other handlers of materials from the recyclable portion[29] of the waste stream.

From 1986 to 1993, the measured statewide recycling rate increased from 15 percent to 38 percent. This increase had been fairly steady, with a slight dip in 1991. In 1994 the measured recycling rate remained steady at 38 percent. In 1995, the recycling rate resumed its climb to 39 percent, and in 1996 the rate dropped to 38 percent. The 1997 recycling rate dropped again to 33 percent as a result of poor paper fiber market in Asia and a continued glut in the metals market. (See Table A.1 for MSW recycling rates for 1986-2005.)

[29] The recyclable portion of the waste stream is municipal solid waste as defined by the Environmental Protection Agency in the *Characterization of Municipal Solid Waste in The United States: 1996 Update*. This includes durable goods, nondurable goods, containers and packaging, food wastes, and yard trimmings. It does not include industrial waste, inert debris, asbestos, biosolids, petroleum contaminated soils, or construction, demolition, and landclearing debris disposed of at municipal solid waste landfills and incinerators.

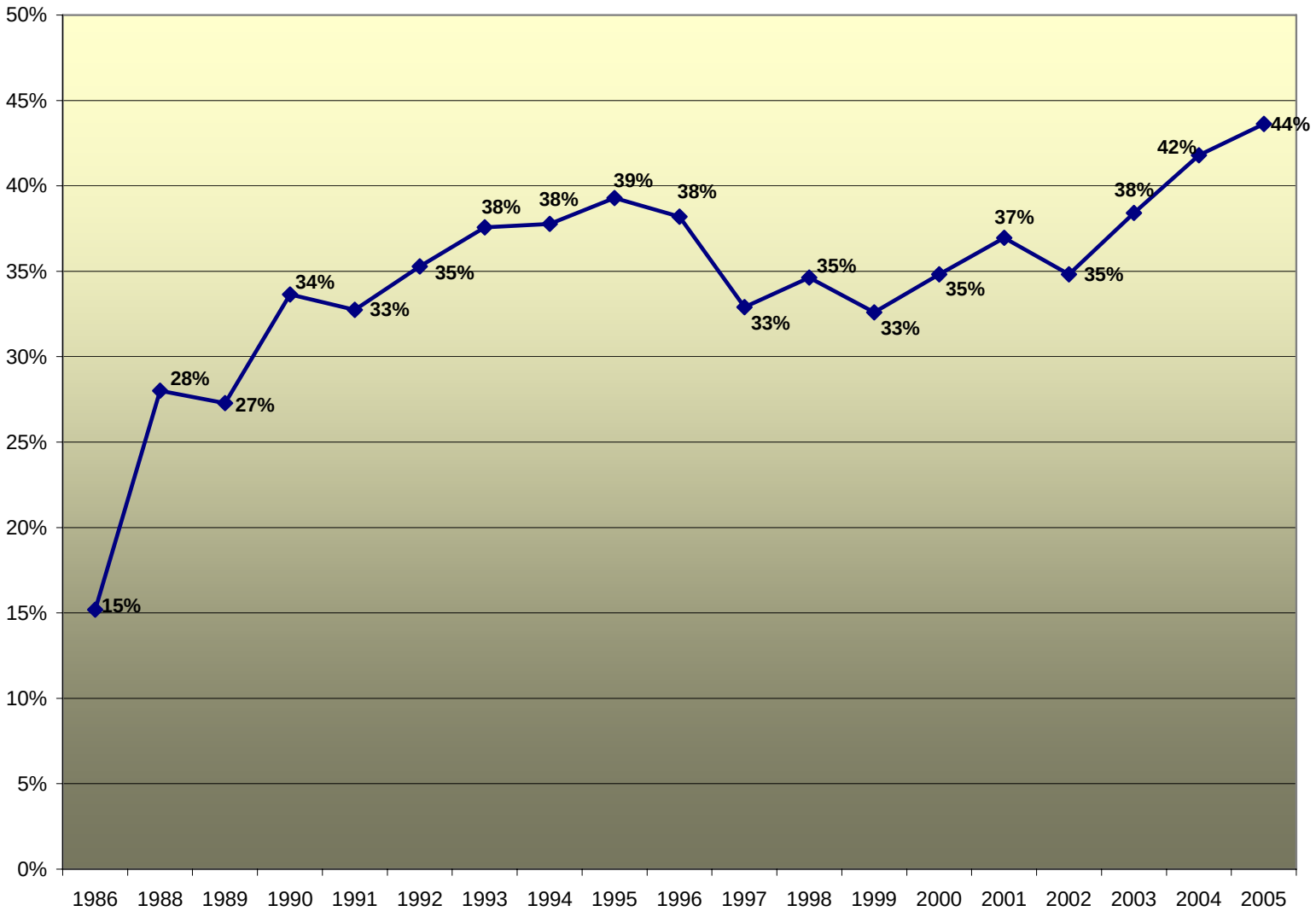
Table A.1 MSW Recycling Rates 1986 to 2005	
Year	**MSW Recycling Rate**
1986	
1988	28%
1989	27%
1990	34%
1991	33%
1992	35%
1993	38%
1994	38%
1995	39%
1996	38%
1997	33%
1998	35%
1999	33%
2000	35%
2001	37%
2002	35%
2003	38%
2004	42%
2005	44%

The poor paper and metal market trend continued in 1998, but improved enough to raise Washington's recycling rate to 35 percent. Although markets improved in 1999, the tonnage disposed of increased enough to drop the recycling rate to 33 percent. Markets continued to improve in 2000, raising the recycling rate again to 35 percent. Although markets for most materials fell in 2001, the increased activity and better reporting for key materials brought the rate to 37 percent. Drops in the market conditions for papers, glass and yard debris, combined with low reporting for food waste and a difference in how wood waste categories are calculated, brought the rate down to 35 percent for 2002.

In 2003, the reporting requirements for recycling facilities changed. These changes resulted in better reporting of recyclables since then. Also, the market demand for ferrous and nonferrous metals was high during 2003, which aided in bringing the recycling rate up to 38 percent. With the continued strong reporting of recyclables collected along with market increases for metals, paper and yard debris, the MSW recycling rate hit 42 percent in 2004, and continued to climb to its current 44 percent in 2005. (See Figure A.1) Detailed data on materials recovery since 1986 can be found at http://www.ecy.wa.gov/programs/swfa/solidwastedata/.

The *Beyond Waste* website also provides quantitative information on specific wastes such as organics, construction & demolition and MRW: http://www.ecy.wa.gov/beyondwaste/.

Figure A.1
Washington State MSW Recycling Rate - 1986 to 2005



In 2006, 84.1 percent of the state's population now has access to curbside recycling services, which are intended to be as convenient as disposal. Most of the people who do not have curbside services do have access to drop-box recycling. The state's population is growing, with almost 800 thousand new people since 1995. Ecology believes that newcomers to the state may not participate as much in recycling because they missed the waste reduction and recycling outreach programs Ecology and the counties ran in the early 1990s. Studies also indicate that without ongoing education and advertising, people tend to forget the recycling message.

How often curbside programs pick up recycling also has an important effect on how much they collect. The City of Seattle attributes a drop in the tons recovered on their curbside programs in 2000 and 2001, partly to the change in collection from weekly to biweekly. As more cities shift to less frequent collection as an efficiency measure, we may see a decline in tonnage collected on these programs. Extra efforts in education could increase participation and offset that possible decline in recycling tonnage.

Many curbside programs in the state are changing to commingled or single-stream systems in an effort to reduce costs and increase collection of recyclables. This trend became more evident in 2003, as new sorting facilities and procedures went into operation. Some evidence suggests that the convenience of not having to sort recyclables leads to more residents taking part. In most cases, programs that changed to commingled collection also increased the range of materials collected. Compared to source-separated collection programs, the single-stream programs are collecting about 10 percent more material. However, this is producing mixed results where end markets are concerned. Reports from mills are showing that the contamination from these programs can be great enough to reduce the usable amount of material by up to 15 percent. Ecology, in conjunction with local governments, has outlined the issue in "Single Stream Versus Source Separation: Considerations Document for Local Government."[30]

Measurement Methodology

See Chapter V for a complete discussion of measurement methodology as it pertains to recycling and diversion.

Results – 2005 MSW Recycling

To consistently compare results from year to year, Ecology includes the same materials it has used since 1986 in the calculation of the MSW recycling rate. These materials are those originating from the MSW stream, as Ecology defined it when designing the recycling survey in the mid-1980s. Table A.2 provides tonnage figures for each material that figured into the MSW recycling rate from 2001 to 2005.

[30] 2004: This document is available by contacting Emma Johnson of Ecology's northwest regional office, at (425) 649-7266, or by e-mail ejoh461@ecy.wa.gov.

Table A.2
MSW Recycled Tonnage Reported
MSW Recycling Rates31 2002-2005

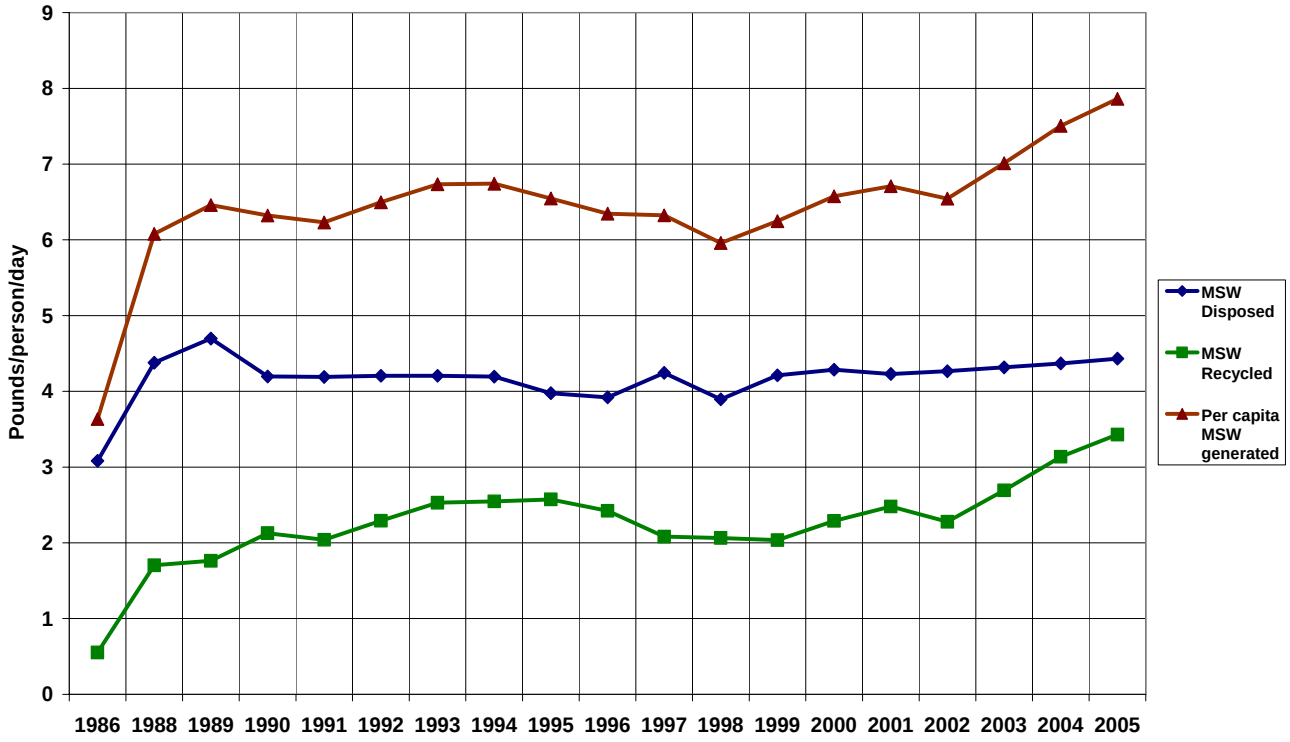
Recycled Materials Reported (MSW)	2002	2003	2004	2005
Computers & Parts	1,414	3,587	6,568	**8,534**
Container Glass	64,937	74,126	81,405	**82,773**
Corrugated Paper	417,534	430,750	535,662	**565,698**
Ferrous Metals	432,778[32]	709,881	866,641	**974,535**
Fluorescent Light Bulbs	417	772	732	**729**
Food Waste	70,904	100,755	126,257	**125,390**
Gypsum	51,089	76,946	35,648[33]	**56,618**
HDPE Plastics	6,029	8,485	7,991	**9,319**
High-Grade Paper	62,312	59,502	70,210	**58,661**
LDPE Plastics	9,775	17,925	10,604	**16,209**
Milk Cartons/Drink Boxes-Tetra	26	1,789	8	**4,529**
Mixed Paper	206,051	219,111	230,934	**322,732**
Newspaper	187,585	215,882	261,306	**259,157**
Nonferrous Metals	61,240	114,604	99,317	**122,490**
Other Recyclable Plastics	949	3,482	7,783	**7,247**
Other Rubber Materials	166	5	12	**0**
PET Plastics	5,886	6,060	6,748	**8,534**
Photographic Films	517	530	522	**487**
Textiles (Rags, Clothing, etc.)	9,440	15,497	28,927	**28,750**
Tin Cans	9,417	9,492	10,082	**12,133**
Tires	27,102	27,753	37,568[34]	**53,777**
Used Oil	43,367	56,344	104,211	**111,692**
Vehicle Batteries	12,158	18,780	25,518	**28,903**
White Goods	43,833	53,353	56,920	**47,302**
Wood	394,261[35]	208,920	257,495	**351,855**
Yard Debris	380,882	546,487	646,674	**643,376**
Total MSW Recycled	**2,512,788**	**2,998,428**	**3,531,753**	**3,916,872**
Total MSW Disposed[36]	**4,703,879**	**4,805,202**	**4,917,870**	**5,060,502**
Total MSW Generated	**7,216,667**	**7,803,630**	**8,449,623**	**8,977,374**
MSW Recycling Rate	**35%**	**38%**	**42%**	**44%**

[31] Detail may not add due to rounding.
[32] Increase can be attributed to greater reporting from recyclers.
[33] Decrease can be attributed to a drop in reporting for this material.
[34] Includes recycled and retreaded tires.
[35] Decrease can be attributed to breaking down into more detailed categories of uses of wood (i.e., wood burned for energy recovery is tracked, but not included with MSW recycled - see diversion numbers below for wood burned for energy recovery.)
[36] The amount of MSW disposed of represents only the quantity defined "recyclable portion" of the waste stream from municipal and commercial sources. It excludes the following waste types reported from landfills and incinerators: demolition, industrial, inert, wood, ash, sludge, asbestos, contaminated soils, tires, medical, and other.

Individual Waste Generation (MSW)

Each person contributes to the MSW stream through recycling and disposal of his or her household wastes. The figures below present only an average of the total contributions of all residents. Some people may actually contribute much more waste than others do. However, the picture tends to be more tangible when described in individual or "per-person" terms. Figure A.2 shows an average of how each person in the state contributes to the **MSW stream**. (See Chapter V for a discussion of the overall waste generation numbers.) In 2005, each resident of the state generated 7.86 pounds of municipal solid waste per day, an all-time high for Washington; 4.43 pounds were disposed of and 3.43 pounds were recovered for recycling (see Table A.3).

Figure A.2
Pounds MSW Disposed, Recycled, and Generated Per Person/Day
1986-2005



Washington residents create, recycle, and dispose of about two pounds of MSW per person above the national averages. This larger disposal number can be accounted for by the fact that Washington has a larger amount of yard and wood waste than the national average as well as a different method of measuring ferrous metals. Along with review by county recycling coordinators and end-use information on recovered materials, comparing per capita numbers to other states' averages provides a check for Washington's recycling numbers.

Table A.3
Pounds MSW Disposed, Recycled and Generated Per Person/Day[37]
1994-2005

MSW	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Disposed	4.19	3.98	3.92	4.24	3.90	4.21	4.29	4.23	4.27	4.32	4.37	**4.43**
Recycled	2.55	2.57	2.42	2.08	2.06	2.04	2.29	2.48	2.28	2.69	3.14	**3.43**
Generated	6.74	6.55	6.35	6.32	5.96	6.25	6.58	6.71	6.55	7.01	7.51	**7.86**

[37] See waste generation chapter for per capita numbers that include diversion and all waste types.