Report

2013 Oregon Material Recovery and Waste Generation Rates Report

By: **Environmental Solutions**
Materials Management Program
Oregon Department of Environmental Quality

December 2014

Last Updated: 12/29/2014
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Acknowledgments

The Oregon Department of Environmental Quality's Materials Management Program conducted the 22nd annual Oregon Material Recovery Survey for calendar year 2013. DEQ extends its appreciation to industry representatives, collection service providers, and landfill administrators and staff for providing recovery and disposal data for 2013 and working with DEQ staff to complete this report. The survey team also thanks DEQ personnel who contributed to the accuracy and integrity of the information contained in this report:

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This report provides one of the most complete and accurate collections of disposal and recycling data in the country.

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Executive Summary

This is the Oregon Department of Environmental Quality's 22nd annual report on municipal[1] post-consumer (residential and commercial) material recovery and waste generation in Oregon. DEQ analyzed detailed annual survey and disposal reports to compute recovery and waste reduction amounts for 2013 and estimated energy savings and greenhouse gas benefits from that waste recovery.

Energy savings and greenhouse gas reduction

When using recovered materials, industry can create new products with significantly less energy and lower greenhouse gas emissions compared to using virgin materials.

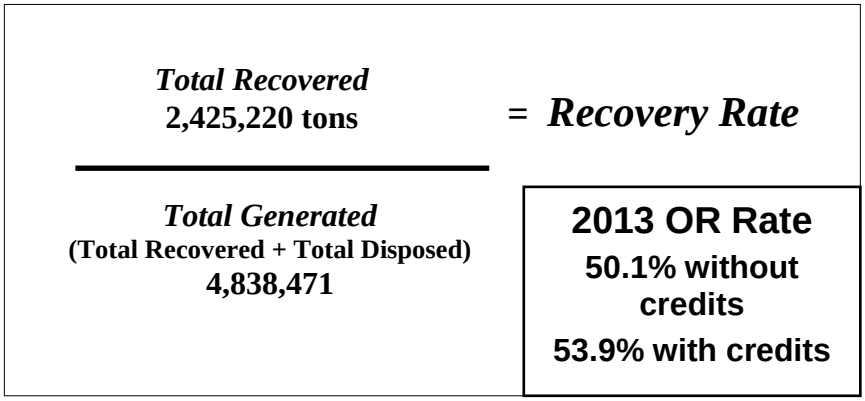
Energy savings in 2013 from recycling and energy recovery totaled approximately 30.6 trillion British thermal units – the equivalent of 267 million gallons of gasoline, or roughly 3.4 percent of total energy used (2013) by all sectors of Oregon's economy.

Greenhouse gas reductions in 2013 from recycling, composting and energy recovery totaled approximately three million metric tons of carbon dioxide equivalents – equal to tailpipe emissions from 690,000 "average" passenger cars, or roughly 4.5 percent of all greenhouse gas emissions statewide (2013.)

Reducing the generation of waste in the first place can achieve even-greater greenhouse gas and energy benefits. Reduction in waste generation likely indicates a reduction in production and use of materials, and a corresponding reduction in emission associated with all stages of the life cycle of material.

2013 statewide recovery, disposal and generation

Oregonians recovered 2,425,220 tons, or 53.9 percent, of the municipal post-consumer waste generated in Oregon in 2013 - the highest recovery rate since this survey began in 1992. This was an increase from the 53.4 percent recovery rate reported for 2012, and the fourth straight year Oregon met its 50 percent recovery goal. Most of this increase was due to increased organics recovery (including yard debris, food waste, animal waste and wood waste). Recovery of paint, plastics and tires also increased, while electronics, glass and metals recovery decreased.



A total of 2,413,251 tons of municipal post-consumer waste was disposed in Oregon in 2013, down 0.4 percent from 2012. Per capita disposal decreased 1.3 percent to 1,232 pounds per person. This is the lowest per capita disposal rate in the 22 years that this survey has been conducted, and is 18.6 percent below the per capita disposal rate for 1992.

[1] Municipal post-consumer waste includes residential and business material recycled, composted, burned for energy recovery, and disposed materials. It excludes industrial materials.

Waste generation is the sum of tons disposed and tons recovered. In 2013, it totaled 4,838,471 tons, a 0.4 percent increase over 2012. This equates to 2,469 pounds per person for 2013, a 0.5 percent decrease from per capita generation in 2012. With these slight changes, the state narrowly missed the state's waste generation goal of no increase in total generation but met the goal of no increase in per capita generation. Nevertheless, the state continued a five-year trend of no or negligible increases in total or per capita waste generation, in sharp contrast to much of the 1990s and early 2000s, when waste generation rose steeply.

Individual wastesheds

Oregon has 35 individual wastesheds, each with its own recovery rate and goal. These include 33 counties, one municipality, and the Portland Metro tri-county area. Thirteen wastesheds increased their recovery rates in 2013, and rates in 27 wastesheds remained above their 2009 recovery rate goals.

Materials recovered in 2013:

The following are the major categories of materials recovered and their percentages by weight of all material recovered in 2013. DEQ does not calculate recovery rates by material, except when current waste composition data is available.

Metals – 21 percent
Yard debris – 20 percent
Wood waste – 17 percent
Cardboard – 15 percent
Other paper – 12 percent
Glass – 5 percent
Plastics – 2 percent
Food waste – 2 percent
Electronics – 1 percent
Other – 5 percent

Of the material recovered, 66 percent was recycled, 20 percent composted, and 14 percent burned for energy recovery.

Conclusion

The energy savings and greenhouse gas reductions from materials recovered for recycling, composting and energy recovery in 2013 were significant. Energy savings were roughly 3.3 percent of Oregon's total 2013 energy use, and greenhouse gas emissions reductions were estimated at 4.5 percent of net statewide emissions from all sources in 2013. The benefits of reducing the generation of waste in the first place are even greater.

Oregon increased its recovery rate of municipal post-consumer waste from 53.4 percent in 2012 to a record-high 53.9 percent in 2013, and for the fourth year met its 50 percent recovery goal. Disposal declined in 2013 by 0.4 percent. Per capita disposal of waste generated in Oregon was 18.6 percent less in 2013 than it was in 1992.

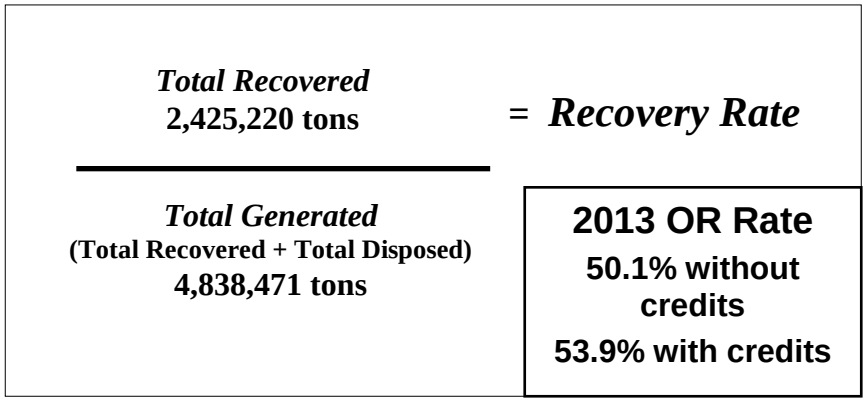
Total generation increased by 0.3 percent, while per capita decreased by 0.5 percent; narrowly missing the state goals of no increase in either measure. Per capita waste generation in 2013 is still about 19 percent lower than it was at its peak in 2006.

Waste generation peaked in 2006, but fell rapidly in 2008-09 and continues to remain well below pre-recession highs, likely indicating that Oregonians are still buying and consuming less.

Nevertheless, per-capita waste generation will need to continue to decrease in future years to hold waste generation steady as Oregon's population increases.

Introduction and Purpose

This report describes results and methodology for Oregon's 2013 Material Recovery and Waste Generation Survey. Each year, the Oregon Department of Environmental Quality compiles data on municipal post-consumer waste recovery. DEQ sends a survey to all collection service providers and private recycling companies that handle materials for recycling, composting and energy recovery. Survey data are combined with data gathered from quarterly and annual disposal site reporting forms. Together, recovery and disposal numbers make up the amount of waste generated by Oregonians each year.



DEQ uses this information to determine energy savings and greenhouse gas reductions, two important environmental benefits from material recovery. DEQ also uses it to calculate material recovery rates and waste generation. The recovery rate is the percentage of the total waste generated in Oregon that is recycled, composted or recovered for energy. Waste generation is the amount of waste recovered plus the amount of waste disposed. Recovery, disposal and generation data, as well as recovery rates, are calculated both for the state and for each of Oregon's 35 individual wastesheds.

Individual wastesheds also use this information to implement and improve their waste prevention and material recovery programs.

This is the 22nd year that DEQ has used the survey to gather this data. The 1991 Oregon Legislature enacted requirements for this annual survey and set goals for the recycling rate. The state goal is 50 percent recovery of municipal solid waste generation by 2009 (and beyond). Goals for individual wastesheds for 2009 ranged from 10 percent for Lake County to 64 percent for the Portland Metro area. In addition, the 2001 Oregon Legislature established the following waste generation goals for the state:

- For the calendar year 2005 and subsequent years, no annual increase in per capita municipal solid waste generation; and
- For the calendar year 2009 and subsequent years, no annual increase in total municipal solid waste generation.

Requirement to Report

Oregon law requires that all publicly and privately operated recycling and material recovery operations complete a Material Recovery Survey form. This includes landfills, local recycling collectors, private recycling collection companies and depots, transfer stations, material recovery facilities, composters, local governments and any other operation that handles post-consumer recoverable materials. Because of the difficulty of separating post-consumer scrap metal from commercial and industrial scrap metal, those companies handling scrap metal are not required to report on privately obtained post-consumer scrap metal, but many do report on a voluntary basis.

The survey requires that companies report all recyclable materials they handle, including amount collected, county of origin, the company they received any transfers from, and where the materials were marketed.

Oregon law further requires DEQ to keep confidential the information reported by private recyclers. This includes customer lists and specific amounts and types of materials collected or marketed by individual companies. Only aggregated information may be released to the public.

Materials Included in the Analysis

Oregon's analysis of the environmental benefits from material recovery and the recovery rates includes only post-consumer materials generated in Oregon for recycling, composting or energy recovery. Waste from manufacturing and industrial processes (pre-consumer materials), reconditioned and reused materials, inert materials such as brick and concrete, and waste originating out of state (but handled in Oregon) are excluded. Some scrap metals, including discarded vehicles or parts of vehicles and metal derived from major demolition activities handled by scrap metal dealers, are also excluded. Scrap metal collected at disposal sites by collection service providers, at community recycling depots or through municipally sponsored collections events counts as recovered material.

The first Material Recovery Survey for the 1992 calendar year included 30 types of materials. Since then, some new materials have been added and other materials consolidated, so that the 2013 survey now contains 33 materials. The major materials for 2013 are:

- **Cardboard**
- **Other Paper** – Paper fiber (combined high-grade paper, newsprint and mixed waste paper).
- **Plastic** – Rigid plastic containers, plastic film, other plastics and composite plastic (including carpet pad).
- **Glass** – Container glass and other glass such as windowpanes and ceramics.
- **Electronics**
- **Wood Waste**
- **Metals** – Tinned cans, aluminum and other scrap metals
- **Yard Debris**
- **Food Waste** – Residential and commercial food waste
- **Other –** Tires, used motor oil, batteries of all types, gypsum, asphalt roofing materials, textiles and paint/solvents, and animal waste.

Energy Savings and Greenhouse Gas Reduction

DEQ uses information from the Material Recovery Survey to estimate energy savings resulting from recycling and counting energy recovery, as well as reductions in greenhouse gases associated with recycling, composting and counting energy recovery.

Energy

When recycled materials replace virgin feedstock in manufacturing, energy savings are significant. Making aluminum from old beverage containers uses 93 percent less energy than making aluminum from bauxite. Newsprint made from old newspapers requires 46 percent less energy than making newsprint from wood. While the energy conservation benefits of recycling have long been recognized, quantifying these estimates can be difficult. The U.S. Environmental Protection Agency developed a model to estimate the amount of per-ton energy savings for recycling for a wide variety of materials. [1]

For 2013, DEQ applied the estimates from EPA's model to tons recycled and counting tons recovered for energy (composting is not included.) Material categories from Oregon's survey do not perfectly align with the material categories in EPA's model, so some assumptions were made in classifying materials. Additionally, EPA's model is based on national averages, which may not be representative of Oregon's recycling and energy recovery markets. Regardless, the use of EPA's model allows for a rough estimate of the energy saved from materials recycled and recovered for energy by Oregonians. Energy recovery includes the conversion of certain wastes to energy via processes such as thermal conversion to electricity, direct combustion for heat, and pyrolysis of waste plastics into synthetic fuels. DEQ estimates that recycling by Oregon households and businesses in 2013 (counting only wastes generated in Oregon, not those generated elsewhere and shipped to Oregon for recycling) led to energy savings of approximately 30.6 trillion British thermal units. The energy produced by energy recovery saved an estimated additional 2.8 trillion BTUs.

To put the energy savings number into context, based on U.S. energy information statistics, total energy use in Oregon across all sectors (transportation, electricity, heating, industry) in 2013 was 253 million BTUs per capita. If per-capita use remained constant through 2013, then the energy savings from recycling and counting energy recovery equates to a 3.4 percent offset of total energy use. This can also be expressed as equivalent to approximately 267 million gallons of gasoline saved in 2013. These comparisons are not perfect. Many of Oregon's recyclable materials are exported to other states or countries, so the energy conservation benefits occur elsewhere. The actual energy saved by recycling includes a mix of not only gasoline and other liquid fossil fuels, but also coal, hydroelectric, nuclear and wood. Nonetheless, the energy savings from recycling and, to a lesser extent, energy recovery in Oregon, are significant.

Greenhouse Gases

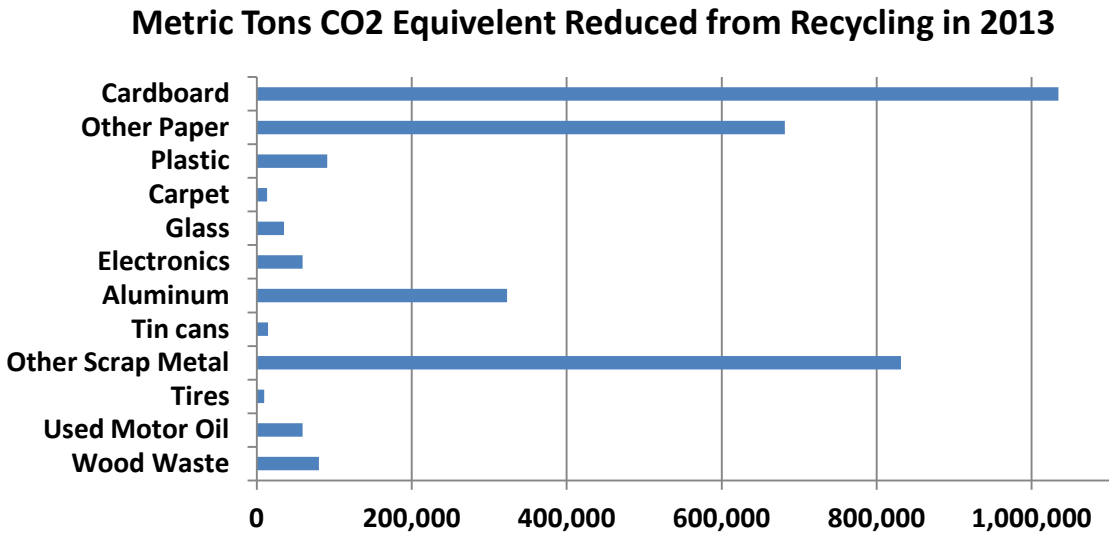
EPA also publishes greenhouse emission factors allowing for estimation of greenhouse gas benefits due to recycling, composting and counting energy recovery. These calculations are relatively involved and use emissions inventory work started in 2004 on behalf of the Governor's

[1] The methodology for obtaining these estimates has changed several times since 2005. Comparisons should not be made between the results for 2013 and previous years.

Advisory Group on Global Warming and updated periodically. The greenhouse gas benefits include a variety of emissions, carbon sinks and emission offsets, which vary by material, management method and the disposal site if the materials were not recovered. Major categories of sinks and offsets include increased carbon storage in forests when recycled paper displaces wood fiber, reductions in fossil fuel use due to the energy savings of recycling, and reductions in methane emissions at landfills.

Net greenhouse gas reductions associated with materials recycled, composted and burned for energy in 2013 are estimated at three million metric tons of carbon dioxide equivalents. This includes only materials that are counted in the Material Recovery Survey and excludes any materials generated in other states and shipped to Oregon for handling. An interesting effect of using EPA's published emission factors and Oregon landfill data for comparison is that composting yard debris is shown to add, rather than reduce, greenhouse gas emissions. This is a small amount, and other benefits of composting outweigh this shortfall. Further, EPA's emission factors for yard debris composting vs. landfilling are believed to contain significant uncertainty, and are the topic of considerable discussion and research.

Net greenhouse gas emissions for Oregon in 2013 (based on an average of 2008 to 2010 per-capita emissions and applying that average to Oregon's 2013 population), using conventional accounting principles, are projected at 66.9 million metric tons of carbon dioxide equivalents. Thus, recycling, composting and counting energy recovery provide a greenhouse gas offset or "credit" corresponding to 4.5 percent of net statewide emissions (from all sources). Most of the benefit is a result of recycling activities, as opposed to composting or energy recovery. In fact, composting and energy recovery, in total, are believed to slightly increase overall emissions of greenhouse gases.



Comparing recovery-related greenhouse gas reductions (3.1 million metric tons) with statewide emissions (66.9 million metric tons) is potentially misleading because the emission reductions from materials recycled and composted in 2013 occur over multiple years, while the estimated emissions of 66.9 million metric tons are "same-year" (2013) emissions. The reductions are spread over multiple years because they include avoided methane emissions from slow decay in landfills, as well as an increase in long-term carbon sequestration in forests and agricultural soils treated with compost. However, just as some of the greenhouse gas benefit from recycling and composting in 2013 will actually occur in subsequent years, some of the greenhouse gas benefit counted for previous years actually occurred in 2013.

Another way to look at the greenhouse gas reductions is to express emission reductions in terms of average cars. Using data from the EPA, Oregon Department of Transportation and Oregon Department of Energy, DEQ estimates that three million metric tons of carbon dioxide equivalents is comparable to the greenhouse gas benefit of eliminating tailpipe emissions from approximately 690,000 “average” passenger cars (out of the state’s stock of approximately 3.3 million registered passenger vehicles). As with energy savings, the greenhouse gas benefit of recycling is significant. Not generating waste in the first place likely produces even greater greenhouse gas and energy benefits; but these are not estimated here.

Recovery Rates

The recovery rate is the percentage of total waste generation that is recovered. DEQ calculates both the statewide recovery rate and a recovery rate for each of the 35 individual wastesheds in the state. Individual wasteshed recovery rates include credits wastesheds claim for certain waste prevention and recovery programs that would otherwise not be counted. Part of those credits, which amounts to nearly four percent and is explained below, is also factored into the state recovery rate.

2013 Statewide Recovery Rate

In 2013, the state recovered 2,425,220 tons of material. Including credits, this represented 53.9 percent of the municipal post-consumer waste stream (50.1 percent without credits), meeting the statewide goal of 50 percent recovery. This is the highest recovery rate calculated for Oregon since the first survey in 1992. Recovered tons increased 1.3 percent from the previous year surveyed, 2012.

From 1992 through 2005, tons of material recovered increased regularly each year. From 2006 through 2009, recovered tons declined even though recovery rates were fairly flat, as declining consumption of newspapers and magazines, followed by a general decline in consumption from the recession reduced the amount of material available to be recovered. Recovered tons have increased since 2010 as recovery rates have again climbed in recent years.

Oregon State Recovered Tons and Recovery Rates

Year	Tons Recovered	Tons Disposed	Calculated Rate	Total Rate*
1992	839,679	2,263,099	27.1	-
1993	974,685	2,280,513	29.9	-
1994	1,118,912	2,312,669	32.6	-
1995	1,257,204	2,362,146	34.7	-
1996	1,338,259	2,497,170	34.9	-
1997	1,462,114	2,633,017	35.7	-
1998	1,604,985	2,695,903	37.3	-
1999	1,626,271	2,788,699	36.8	-
2000	1,765,817	2,778,463	38.9	-
2001	1,999,085	2,635,072	43.1	46.8
2002	2,029,261	2,723,365	42.7	46.3
2003	2,116,880	2,796,787	43.1	46.8
2004	2,317,064[1]	2,923,462	44.2	48.0
2005	2,523,367[1]	3,026,457	45.5	49.2
2006	2,494,050[1]	3,235,828	43.5	47.3
2007	2,437,569[1]	3,248,126	42.9	46.6
2008	2,326,146[1]	2,890,503	44.6	48.2
2009	2,082,631[1]	2,586,721	44.6	48.3
2010	2,163,957[1]	2,523,808	46.2	49.9
2011	2,306,124[1]	2,437,767	48.6	52.3
2012	2,394,047[1]	2,422,883	49.7	53.4
2013	2,425,220	2,413,251	50.1	53.9

***** These rates are including the addition of credit allowances enacted by the 2001 Legislature

[1] These tonnage figures are corrected from earlier published values

A total of 2,413,251 tons of municipal post-consumer waste were disposed in Oregon in 2013, down 0.4 percent from 2012. This is lower than any disposal tonnage since 1995. Per-capita disposal decreased 1.3 percent to 1,232 pounds per person, the lowest amount since material recovery data collection began in 1992. This is 18.6 percent lower than the 1992 figure of 1,513 pounds per person.

Total tons disposed added to total tons recovered equaled 4,838,471 tons of total waste generated in 2013 (see Waste Generation). Total generation rose by 0.4 percent; and per-capita generation decreased by 0.5 percent from 2012 levels.

Waste recovery increased (+31,173 tons) faster than disposal dropped (-9,632 tons), resulting in the increase in generation (+21,541 tons). This is in sharp contrast to the yearly increases in both disposal and recovery during most of the period between 1992 and 2006. Waste generation was nearly one million tons less in 2013 than it was at its peak in 2006. This is a drop of almost 16 percent in waste generation between 2006 and 2013, or more than 20 percent if measured on a per-capita basis.

How DEQ Calculates the Statewide Recovery Rate

DEQ combines information about quantities of material collected from privately-operated recycling and material recovery facilities with recovery information from collection service providers and disposal site collections. This determines the total weight of material recovered.

Next, it adds the total weight of material recovered to the total weight of material disposed, obtained from disposal site reports. This sum is the total weight of material generated. The total weight of material recovered is divided by the total weight generated. This results in the calculated recovery rate.

In 2001, the Oregon Legislature changed the method of calculating the total recovery rate for the state to include part of the two percent reuse and residential composting credits (but not waste prevention credits) earned by wastesheds. This statutory change requires a more complex series of calculations[2] to determine that part of the wasteshed credit amounts that are added the calculated state recovery rate to obtain the total statewide recovery rate.

How DEQ Calculates Individual Wasteshed Recovery Rates

The total weight of material recovered is allocated to the wasteshed of origin. Direct collectors of materials are the primary and best information source for the collected materials' wasteshed of origin. When information from direct collectors is not available, or when a survey respondent does not know the wasteshed of origin for the collected materials, the markets' and end users' estimates are the secondary method used to allocate material back to wastesheds. Material is allocated back to wastesheds based on population in rare cases when survey respondents and market information is insufficient.

DEQ also allocates the total weight of material disposed to the wasteshed of origin. For each wasteshed, total weight of material disposed is added to total weight of materials recovered to ascertain the amount of waste generated in the wasteshed. The total weight of material recovered is divided by the total weight generated to determine the calculated recovery rate for each wasteshed.

Since 1997, individual wastesheds have been allowed to claim recovery credits for waste prevention, reuse and residential composting. Each wasteshed must apply for credits as part of its annual Opportunity to Recycle Report submitted to DEQ. DEQ reviews credit applications to determine whether credits qualify under statutory criteria. A wasteshed may claim up to three two percent recovery rate credits, one credit each for reuse, waste prevention and residential composting programs. These credits are added to the calculated recovery rate to obtain the total recovery rate (for example, 40 percent calculated recovery rate + four percent credits = 44 percent total recovery rate)[3]. DEQ uses the total recovery rate to determine whether a wasteshed is achieving its recovery goal.

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[2] The statewide total recovery rate is derived by first estimating what is called “adjusted recovery” for each wasteshed. The calculation of adjusted recovery involves calculating the tonnage that would be recovered if the two percent credits earned for reuse and residential composting were included in each wasteshed’s calculated recovery rate, holding disposal tonnage as a constant. For wastesheds where no two percent credits were obtained, adjusted recovery is equal to calculated recovery. For wastesheds with recovery credits, adjusted recovery is higher than calculated recovery because adjusted recovery includes the tonnage attributed to reuse and residential backyard composting.

To obtain the statewide total recovery rate, the adjusted recoveries for all wastesheds are summed together to equal a statewide adjusted recovery amount. This is then added to the actual statewide disposal tonnage to get a new estimate of waste generation (adjusted generation). The statewide total recovery rate is then calculated by dividing the adjusted recovery by the adjusted generation.

[3] Recovery rate credits for individual wastesheds are handled differently in determining the statewide recovery rate. (See Footnote 3.)

Eighteen Wastesheds Receiving Recovery Credits in 2013							
Baker	2%	Jackson	6%	Metro	6%	Union	6%
Benton	6%	Lane	6%	Morrow	2%	Wasco	6%
Deschutes	6%	Lincoln	2%	Polk	2%	Yamhill	6%
Douglas	6%	Linn	6%	Sherman	6%		
Hood River	6%	Marion	6%	Tillamook	4%		

Marion County Adjustment

As home to the state's only municipal waste-to-energy incinerator, Marion County's recovery and disposal tonnages are revised each year to include certain wastes burned for energy as recovered, as directed by the 2001 Legislature. For 2013, the five materials that could be counted toward the recovery rate when burned for energy were wood, yard debris, used motor oil, fuels and plastics. In 2013, 12,095.85 tons of these materials burned for energy in the county's incinerator were counted as recovered instead of disposed. DEQ obtained this tonnage by multiplying the quantity of non-industrial, in-county, counting solid waste processed at the facility by the percentage that those six materials make up of Marion County's municipal solid waste disposal stream[4]. Marion County also recovered 7,862.32 tons of scrap metal from the incinerator ash. DEQ subtracted the scrap metal tonnage from the Marion County disposed tons so that the same tons would not be counted as being both disposed and recycled.

Wasteshed Recovery Rates

Oregon has 35 individual wastesheds, each with its own recovery rate and goal. Thirteen wastesheds increased their recovery rates in 2013, and rates in 27 wastesheds remained above their 2009 recovery rate goals

The Survey Report Tables listed on page 23 of this report show 2013 recovery rates for each wasteshed (Table 1), tons of materials recovered in 2013 by wasteshed (Table 2), and tons of solid waste disposed by wasteshed in 2013 (Table 3).

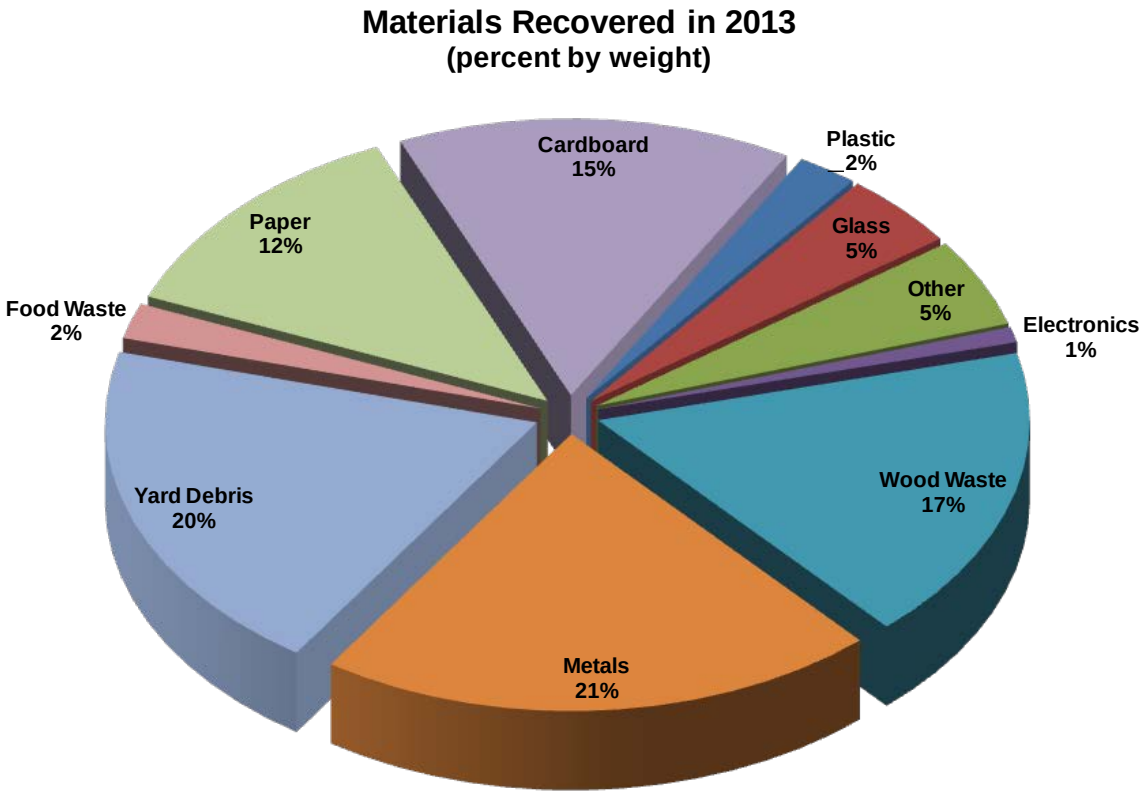
For a historical look at recovery, disposal and generation data in Oregon, see Survey Report Tables 4, 5, 6 and 7, which provide the recovery rates, recovered material tons, disposal tons, and tons of solid waste generated each year since the Material Recovery Survey began in 1992.

[4] The percentages are from the 2009-10 Marion County waste composition study.

Materials Recovered

Oregon's material recovery rate for 2013 includes materials that were recycled, composted (including yard debris, food waste and some wood waste), and burned for energy (including tires, fuels, oil-based paint, used oil, wood waste and some yard debris). Sixty-six percent of the material recovered was recycled, 20 percent was composted and 14 percent was burned for energy.

The chart below shows major categories of materials recovered in 2013 and the percentage of total recovery (by weight) for each category. Specific materials included in these categories are listed on page 7.



The following describes changes in amounts of materials recovered in 2013:

Metals. The total amount of recovered metals, after decreasing six percent in 2012, decreased by another six percent in 2013.

Paper (including cardboard). Last year, paper fibers showed a ten percent increase from 2011 to 2012. This year, paper fibers increased 0.7 percent in recovered tons from 2012.

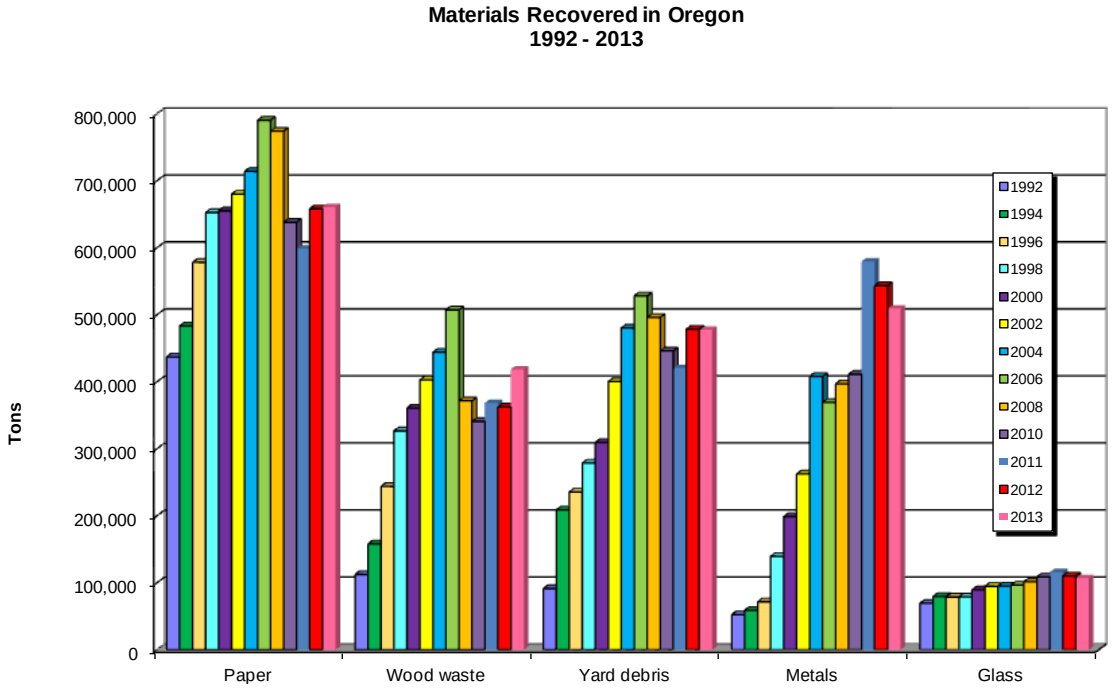
Plastic. Total plastics recycling decreased slightly by four percent in 2013. Most of the decline was in "other rigid plastic," probably related to import restrictions imposed by China in 2013 on dirty mixed plastics.

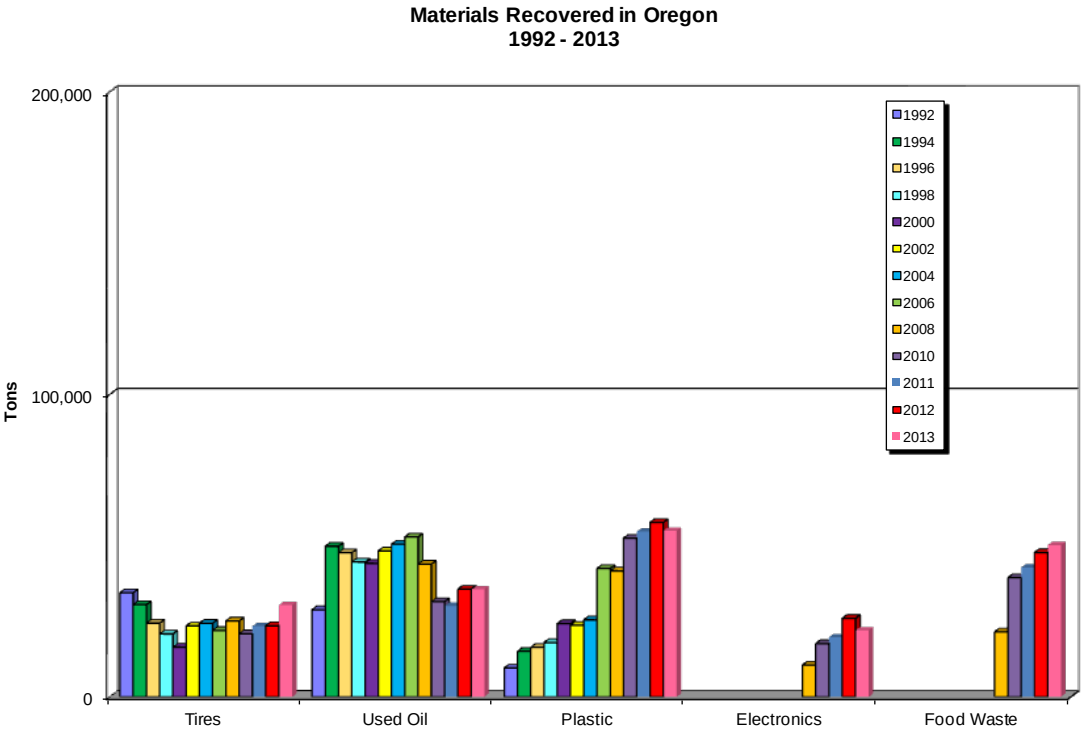
Glass. Glass recovery decreased 0.5 percent in 2013.

Electronics. This material showed a 15 percent decrease in total tons recovered in 2013. The decrease is likely attributable to lighter weight electronic devices and possibly fewer collections over the year.

Organics. Overall organics (which includes wood waste, yard debris, food waste and animal waste/grease) total recovery increased by seven percent in 2013; including a five percent increase in food waste recovery.

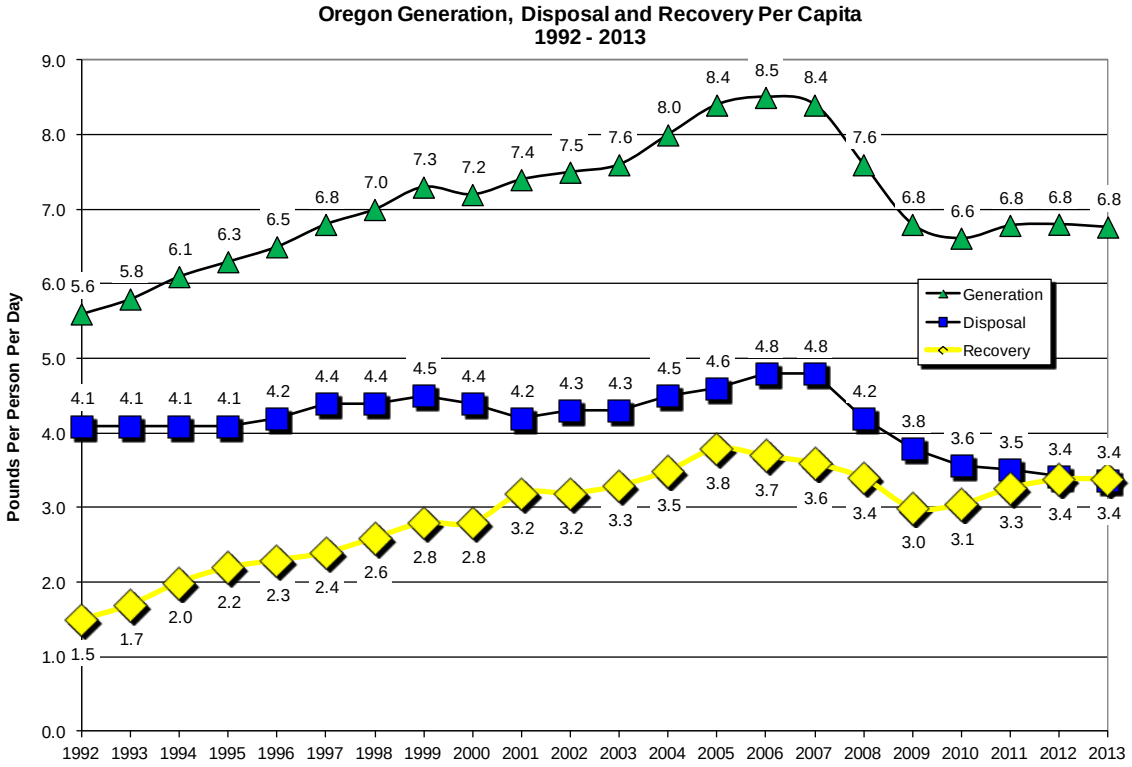
The following charts compare the materials recovered by year over the past 22 years.





Waste Generation

The total amount of municipal solid waste generated (materials recovered plus waste disposed) in Oregon remained nearly constant from 2009 to 2013. Oregon generated 4,838,471 tons of municipal solid waste in 2013, an increase of 0.4 percent over 2012. This equates to per- capita generation of 2,469 pounds per person (6.8 pounds per day), a slight 0.5 percent decrease from 2,483 pounds per person (6.8 pounds per day) in 2012. The state narrowly missed the state's goal for no increase in total generation, but met the goal for no increase in per-capita generation. However, total waste generation in 2013 continued to be nearly one million tons less than at its peak in 2006. This is a drop of nearly 16 percent in total waste generation between 2006 and 2013, or more than a 20 percent drop in the per-capita amount.



Generation is a crude measure of consumption, and for many materials, the environmental impacts of production (the corollary of consumption) are many times higher than the impacts of disposal. For example, recent EPA analysis suggests that roughly 40 percent of the country's greenhouse gas emissions are associated with the production and transportation of goods. The leveling off of waste generation in 2007, the decline in 2008 and 2009 and only slight increases in 2010 through 2013 likely indicate a reduction in use of materials. Reduction in use would, in turn, likely result in a reduction of greenhouse gas emissions associated with all stages of the life cycle of materials. Many other adverse environmental impacts associated with materials likely also decreased.

The following table shows the disposition of the municipal solid waste generated in Oregon in 2013.

Disposition of Waste Generated in Oregon in 2013	
Disposition	**Percent by weight**
Disposed*	49.9
Recycled	33.1
Composted	9.9
Recovered for Energy*	7.1

*For the Marion County's waste-to-energy facility only the portion of waste that counts toward the county's and state's recovery rates is included here in "recovered for energy" (see Marion County Adjustments on page 13). Other wastes burned at the facility are counted here as disposed.

Conclusion

The energy savings and greenhouse gas reductions from materials recovered for recycling, composting and energy recovery in 2013 were significant. Energy savings were comparable to 267 million gallons of gasoline or roughly 3.3 percent of Oregon's total 2013 energy use. Reductions in greenhouse gas emissions were estimated at three million metric tons of CO2 equivalents or 4.6 percent of net statewide emissions from all sources in 2013. Recycling produced most of these benefits.

Reducing the generation of waste in the first place can achieve ever-greater greenhouse gas and energy benefits than material recovery. Reduction in waste generation likely indicates a reduction in production and use of materials, and a corresponding reduction in emissions associated with all stages of a material's life cycle.

Oregon recovered 2,425,220 tons of material for recycling, composting and energy recovery, achieving a 53.9 percent recovery rate including credits (50.1 percent without credits) in 2013. This is the highest recovery rate since this survey began in 1992 and the fourth straight year Oregon met its 50 percent recovery goal.

A total of 2,413,257 tons of municipal post-consumer waste was disposed in Oregon in 2013, down 0.4 percent from 2012. Per-capita disposal also decreased, and now is 19 percent lower than it was in 1992.

Total tons disposed added to total tons recovered equaled 4,838,471 tons of total waste generated in Oregon in 2013. Total generation increased by 0.4 percent, while per capita decreased by 0.5 percent; narrowly missing the state goals of no increase in either measure. Still, the amount of waste generated in 2013 was nearly one million tons or nearly 16 percent less than the waste generated in the peak year of 2006.

Waste generation peaked in 2006, but fell rapidly in 2008-2009, and continues to remain well below pre-recession highs, likely indicating that Oregonians are still buying and consuming less. Nevertheless, per-capita waste generation will need to continue to decrease in future years to hold waste generation steady as Oregon's population increases.

Adjustments to Reports from Previous Years

DEQ continues to review and use survey data even after publishing the final report each year. Occasionally, we encounter and correct errors in previously reported results. Thus, tonnages published in this report for previous years may not match the tonnages originally reported for that year.

DEQ made the following adjustments for the 2013 report:

- An error in food waste reporting discovered by DEQ showed a large amount of food waste was double counted in the 2011 and 2012 reports. The food waste was counted both by the composting facility and by the recycling collectors.
- More accurate reporting identified corrections needed in tonnages for used oil, antifreeze, solvents and used oil filters in 2011 and 2012.

DEQ corrected data in previous years, for the following reasons:

- An error in reporting was discovered by one of the recycling processors; a large amount of newspaper was double counted in the previously published 2004 results. The paper was counted both at the processing facility and at the paper mill.
- An enforcement action carried out by Metro showed that most of the brick reported as being recycled by one facility was falsely reported. DEQ subsequently decided that brick more closely resembled other inert materials such as cement and asphalt. Since these are not counted toward the recovery rate, brick was removed from all previous recovery tonnages.
- New information showed that corrections needed to be made to tonnages for roofing and non-container glass in 2003 and 2004, as well as other minor adjustments in other categories.
- Field visits showed that some plastic for 2005 had been reported as ‘Plastic Other’ and that this material was actually ‘Rigid Plastic Containers.’ The 2005 numbers have been adjusted for this change, along with a few other minor adjustments.
- Field visits and continued investigation showed that previously reported ‘Wood Waste’ collections for 2006 were actually collected in three years – 2004, 2005 and 2006. These years are now correct.
- The 2006 and 2007 plastics numbers were adjusted between grades of “Rigid Plastic Containers,” “Plastic Other,” and “Plastic Film.” This may have led to small changes in the recovered tonnages for these materials.
- Investigation of disposal numbers at two landfills led to deductions in the amount of SW disposed – these were really Industrial Waste, non-counting for the purposes of this survey.
- Some changes were made in 2006 and 2007 to disposition of materials. Changes were made to composted, burned for energy recovery and disposed amounts.
- Adjustments were made to the 2007 collection amounts, correctly identifying the wasteshed of origin.
- For 2006 and 2007, some non-counting slaughterhouse material was deleted from the recovered tonnage.
- Sawdust material from manufacturing was deleted for 2006 and 2007.
- Beginning with 2006, material previously identified as “CD – Construction and Demolition” was separated out into individual materials.

- Textiles previously counted were determined to be re-used, which does not count for recovery. 2006, 2007, 2010 and 2011 recovered tonnage was decreased.
- Some gypsum sent for disposal was included in the 2006 and 2007 tonnage – this was removed.
- Bottle bill materials, container glass and aluminum had better reporting for 2009, and DEQ made some adjustments to those materials for 2008.
- Municipal solid wastes from another landfill were determined to be industrial and were deleted from the 2007 and 2008 counting tonnages.
- Minor disposal adjustments were made to two wastesheds for 2006 data with incorrectly reported county of origin.
- Yard debris numbers contained a large double counting for the Metro region – the correction caused a decrease in recovered tons
- Some roofing material was deleted - it was determined to be industrial material
- Added in disposal tonnages for 2009 and 2010 for material sent out of state for disposal.
- Corrected the disposition methods for food waste and yard debris in 2011.
- Fixed the disposal tonnages originally recorded for the incorrect wasteshed in 2011.

2013 Survey Report Tables

Links to the data tables one through nine used for this report.

Table 1: Wasteshed Recovery Rates, 2013

Table 2: Amount Recovered in 2013 by Wasteshed

Table 3: Solid Waste Disposed in 2013 by Wasteshed

Table 4: Oregon Calculated Recovery Rates by Wasteshed, 1992-2013

Table 5: Oregon Amount Recovered by Wasteshed, 1992-2013

Table 6: Oregon Solid Waste Disposed by Wasteshed, 1992-2013

Table 7: Oregon Solid Waste Generated by Wasteshed, 1992-2013

Table 8: Oregon Materials Recovered, 1992-2013

Table 9: Disposition of Recovered Materials, 2013

Appendix I: Methodology

Data Sources

In 2013, DEQ collected recycling and disposal data from:

- 230 private companies handling recycled materials, including buy-back centers, intermediate processors, material recovery facilities, yard debris composting facilities, beer and soft drink distributors, and end users
- 165 collection service providers
- 9 scrap metal dealers
- 38 disposal sites or waste exporters handling municipal and construction and demolition wastes.

Data Collection and Management

Recyclers and collection service providers who directly collect material in each county were surveyed. However, since it is not practical to identify and survey each individual generator of recyclable materials (such as all the retail stores in the state), DEQ also surveyed material processors and end users. Survey recipients were asked to return the completed surveys to DEQ by Feb. 28, 2014. Metro and local government officials reviewed metro-area and individual county wasteshed collection service provider forms for completeness and accuracy before forwarding them to DEQ. As soon as DEQ received the survey information, its staff checked data for completeness and, in many instances, verified information by calling the survey respondent. Once approved, DEQ entered the data into a database and performed a number of quality control checks The two most important checks were:

Comparing information from different sources. For example, often collectors report sending more material to recyclers (or end users) than the recyclers report receiving. This issue is usually resolved by calling the receiving recycler or both the recycler and the collector to determine the source of the discrepancy. When a discrepancy cannot be resolved by talking to the involved recyclers and collectors, information provided by the end user is used in most cases.

Examining per-capita recycling calculations for unlikely results. For example, occasionally more material is reported as recovered than would be expected in a county, based on estimates using population. DEQ resolves this issue by determining which survey respondents reported collecting or handling the material for the county in question, looking for unlikely results in their reports, and calling the involved recyclers and collectors. Problems in units of measurement used sometimes cause these anomalies.

Quality of Data

DEQ has collected recovery and waste generation rate data for 22 years. Many entities who report have set up their own record-keeping mechanisms to help them provide complete, accurate and timely data. However, each year DEQ staff encounter problems with reported data that need to be resolved. For example, the 2013 surveys included instances of food waste being improperly reported resulting in double counting tonnage from composting facilities. Other errors in reporting include composted materials and material burned for energy reported as recycled. Some reporters provided more accurate data on materials they have traditionally handled due to new staff and updating reporting tactics. Other companies did not include data for all facilities they operate or failed to submit a survey form.

Double Counting of Materials

The processing and handling chain for each recyclable material is varied and complex – it can involve multiple companies handling the same material. In addition, DEQ determines recovery rates for individual wastesheds as well as the state as a whole. The potential for double counting of materials in this process is a major challenge. For example, companies collecting materials, processors who purchase the materials from the collectors, and markets and end users of materials are all surveyed and report on the same materials.

Having information on where each collector or recycler sells their material allows DEQ to eliminate the double counting of that material. DEQ's database can track materials transferred from collector to recycler, collector to collector, or recycler to recycler, accounting for each material a company sold to an intermediate processor, while at the same time keeping track of the county of origin for that material. Thus, no matter where a material is ultimately recycled, composted or burned for energy, DEQ can give proper credit to the wasteshed of origin.

Commingled Collection

Many areas of Oregon collected commingled recyclable materials. A dual stream system is used – glass is kept separate from the other mixed materials. This material is sent to processors or material recovery facilities. DEQ asked these entities to complete an additional commingled survey form. The added information describes individual materials that are sorted out of the commingled collection material mix.

DEQ combines the received commingled amounts into one type – Commingled All. The material recovery facility receipt and sorting data is used to apply back to the companies that collect and transfer commingled materials to the recovery facilities. Individual materials sorted from the Commingled All collections are allocated back to the collecting wasteshed. These allocations are based on sorting estimates for individual materials. All areas sending materials to one processor receive the same sorting percentage allocation, which may not exactly match the actual collections percentages of their commingled mix. The sorted data integrity is "homogenized" and so a bit weakened. To further complicate material tracking, some commingled materials now pass through a transfer operation in between the collection service provider and material recovery facility. The difficulty in identifying specific materials in mixes is an unfortunate outcome of collecting and transferring recyclables in commingled packs. However, the volume of collected materials is greatly increased by this collection method.

Disposal Data

Information on disposal tonnage comes from annual or quarterly reports filed with DEQ by disposal sites for fee collection purposes. Disposal sites report counting waste by county and DEQ uses this amount to calculate the recovery rate. "Counting" waste includes municipal solid waste as well as construction and demolition wastes such as wood waste, asphalt roofing, carpet pad, upholstery foam and gypsum wallboard. Also included in the counting disposal tonnage is animal waste and grease and tires. The following non-counting waste is excluded from this survey: industrial waste from manufacturing processes; sewage sludge; asbestos; petroleum-contaminated soil; and inert waste (full loads only) such as rock and gravel, dirt, concrete, brick and asphalt paving.

Appendix II: Respondents to the 2013 Material Recovery Survey

PRIVATE RECYCLING
Survey Respondents

1010 TOWING & RECYCLING
Brookings, OR

A&P RECYCLING
The Dalles, OR

ACCESS INFORMATION MANAGEMENT
Eugene, OR

ADVANCED M & D SALES
Portland, OR

AGILYX
Beaverton, OR

AGRIPLAS INC
Keizer, OR

ALLIED ENVIRONMENTAL SERVICES LLC
Medford, OR

ALLWOOD RECYCLING
Fairview, OR

AMERICAN RAG AND METAL
Portland, OR

ARMSTRONG WORLD IND INC
St Helens, OR

ASH GROVE CEMENT
Durkee, OR

ASTORIA LIONS CLUB
Astoria, OR

ASTORIA WAREHOUSING
Astoria, OR

BAKER COMMODITIES
Seattle, WA

BAR 7A TRUCKING
Redmond, OR

BATTERY SYSTEMS OF MEDFORD
Medford, OR

BEAVER BARK, INC
Scappoose, OR

BEND METRO PARKS & RECREATION DIST
Bend, OR

BERG MILL
Los Angeles, CA

BEST BUY IN TOWN
Hillsboro, OR

BIO-MASS-ONE, LP
White City, OR

BRING RECYCLING
Eugene, OR

BUREAU OF LAND MANAGEMENT
Vale, OR

CALBAG METALS CO
Portland, OR

CAROTHERS TIRE
Hillsboro, OR

CHERRY CITY METALS
Salem, OR

CINTAS DOCUMENT MANAGEMENT
Portland, OR

CITY OF COTTAGE GROVE
Cottage Grove, OR

CITY OF EUGENE
Eugene, OR

CITY OF FLORENCE
Florence, OR

CITY OF GRANTS PASS
Grants Pass, OR

CITY OF KLAMATH FALLS
Klamath Falls, OR

CITY OF PORTLAND
Portland, OR

CITY OF THE DALLES
The Dalles, OR

CITY RECYCLE, LLC
Portland, OR

CLACKAMAS COMPOST
Tualatin, OR

CLATSOP DISTRIBUTING CO
Astoria, OR

CLAYTON WARD CO
Kennewick, WA

CLAYTON WARD CO
Salem, OR

CLEAN IT UP MARK
Portland, OR

COLUMBIA COUNTY SOLID WASTE
St. Helens, OR

COLUMBIA GORGE PRESS
Hood River, OR

COLUMBIA RECYCLING PDX
Portland, OR

COMPUTER DRIVE CONNECTION
Cornelius, OR

CONAGRA FOODS
Boardman, OR

CORE RECYCLING (CITY OF ROSES)
Portland, OR

CTG LLC DBA SHINGLE SALVAGERS NW
Milwaukie, OR

D & R DIETRICH & SONS, INC
Vancouver, WA

D.A.D.S. RECYCLING
Vernonia, OR

DAISHOWA AMERICA (NIPPON IND)
Port Angeles, WA

DARLING INTERNATIONAL
Boise, ID

DARLING INTERNATIONAL
Tacoma, WA

DENNIS CARLIN HAULING
Woodburn, OR

DENTON PLASTICS INC
Portland, OR

DIRT HUGGER
The Dalles, OR

ECHANIS DISTRIBUTING CO
Ontario, OR

ECOSORT
Eugene, OR

ECS REFINING LLC
Medford, OR

EG METALS INC
Hillsboro, OR

EMERALD SERVICES
Tacoma, WA

ENVIRONMENTAL FIBERS INTERNATIONAL
Portland, OR

ENVIRONMENTAL PROTECTION SERVICES INC
Brooks, OR

ENVIRONMENTALLY CONSCIOUS RECYCLING
Portland, OR

EPSON
Hillsboro, OR

ERICKSONS SENTRY MARKET
Burns, OR

EUGENE MISSION
Eugene, OR

EXIDE TECHNOLOGIES
Portland, OR

FAR WEST FIBERS
Portland, OR

FRED MEYER
Clackamas, OR

FRED MEYER
Portland, OR

FREE GEEK
Portland, OR

FULL SAIL BREWERY
Hood River, OR

GARDNER ENTERPRISES INC
John Day, OR

GARTEN FOUNDATION
Salem, OR

GARY GRUNER CHEVROLET
Madras, OR

GEORGIA PACIFIC CORP
Halsey, OR

GEORGIA PACIFIC CORP
Toledo, OR

GODFREY & YEAGER EXCAVATING
Coos Bay, OR

GOODWILL INDUSTRIES
Eugene, OR

GOODWILL INDUSTRIES
Portland, OR

GORGE SECURITY SHRED
Hood River, OR

GOSPEL RESCUE MISSION
Grants Pass, OR

GRAF PAPER SALVAGE
Portland, OR

GREENWAY RECYCLING
Portland, OR

GRIMMS FUEL CO
Tualatin, OR

HANKE'S RECYCLING
Portland, OR

HI-SCHOOL PHARMACY
Vancouver, WA

HILTON FUEL
Central Point, OR

HINES NURSERY
Forest Grove, OR

HOOD RIVER COUNTY
Hood River, OR

HOOD RIVER LIONS
Hood River, OR

HOOKER CREEK CO
Bend, OR

INTERNATIONAL PAPER
Beaverton, OR

INTERSTATE PLASTICS
Vancouver, WA

IRAS SALES & SERVICE
Madras, OR

IRON MOUNTAIN
Portland, OR

ITREX LLC
Central Point, OR

JEFFERSON AVENUE RECYCLERS
LaGrande, OR

JOHNSON CONTROLS
Canby, OR

K&S RECOVERY
Aloha, OR

K&S RECYCLING INC
West Linn, OR

KB RECYCLING
Canby, OR

KE MCKAYS
Gold Beach, OR

KINGSLEY AIR FIELD
Klamath Falls, OR

KIWANIS CLUB
Tillamook, OR

KLAMATH RECYCLING
Klamath Falls, OR

KNEZ BUILDING MATERIALS
Clackamas, OR

LAKESIDE RECLAMATION
Beaverton, OR

LANE FOREST PRODUCTS
Eugene, OR

LAURELWOOD FARMS
Gearhart, OR

LES SCHWAB WAREHOUSE CENTER
Prineville, OR

LIFESPAN TECHNOLOGY RECYCLING
Denver, CO

MANZANITA GROCERY AND DELI
Manzanita, OR

MARION RESOURCE FACILITY
Brooks, OR

MARKET OF CHOICE
Eugene, OR

MCFARLANES BARK INC
Milwaukie, OR

MCGOVERN METALS
Roseburg, OR

MCKENZIE RECYCLING
Eugene, OR

MERLIN PLASTICS
Delta, BC

METRO
Portland, OR

MORROW COUNTY PUBLIC WORKS
Lexington, OR

MYERS CONTAINER CORPORATION
Portland, OR

NATURES NEEDS
North Plains, OR

NEXT STEP RECYCLING
Eugene, OR

NORTHWEST POLYMERS
Molalla, OR

NORTHWEST WOOD AND FIBRE RECOVERY INC
Troutdale, OR

NW GREENLANDS
McMinnville, OR

NW GREENLANDS – COMPOST OREGON
Salem, OR

OIL RE-REFINING INC
Portland, OR

ON TO TECHNOLOGY
Bend, OR

OREGON BEVERAGE RECYCLING CO-OP
Portland, OR

OREGON COMPUTER RECYCLING, INC
Warrenton, OR

OREGON PALLET
Salem, OR

OREGON RECYCLING SYSTEMS
Portland, OR

OWENS ILLINOIS GLASS CONTAINER INC
Portland, OR

OWYHEE DISTRIBUTING CO INC
Nyssa, OR

P & E DISTRIBUTING CO
Baker City, OR

PACIFIC DISC INC (PACIFIC RUBBER)
Toledo, OR

PAINT CARE
Clackamas, OR

PALLET DOCTOR
Cornelius, OR

PAPER CHASE RECYCLING
Portland, OR

PENDLETON BOTTLING CO
Pendleton, OR

PEPSI COLA BOTTLING CO
Klamath Falls, OR

PEPSI COLA BOTTLING CO
La Grande, OR

PEPSI COLA BOTTLING CO
The Dalles, OR

PHILIP SERVICES CORPORATION
Kent, WA

POLK COUNTY
Dallas, OR

PORT OF BROOKINGS
Brookings, OR

PORTLAND HABILITATION CENTER INC
Portland, OR

PRIDE
Sherwood, OR

PRINCES AUTOMOTIVE
Madras, OR

QUALITY COMPOST
Milton-Freewater, OR

QUANTUM RESOURCES
Beaverton, OR

RB RECYCLING
Portland, OR

RB RUBBER
McMinnville, OR

REACH INC
Klamath Falls, OR

RECALL
Kent, WA

RECHARGEABLE BATTERY RECYCLING CORP
Atlanta, GA

RECOLOGY OREGON MATERIAL RECOVERY
Portland, OR

RECYCLE AMERICA
Troutdale, OR

REKLAIM TECHNOLOGIES
Boardman, OR

RESCO PLASTICS INC
Coos Bay, OR

RETRONICS
Portland, OR

REXIUS FOREST BY-PRODUCTS
Eugene, OR

RIDGELINE RECYCLING
White City, OR

RIMROCK RECYCLING
Burns, OR

RITE AID
Wilsonville, OR

ROCKTENN
Portland, OR

ROGUE MATERIAL RECOVERY
Central Point, OR

ROSAUER'S SUPER MARKET
Hood River, OR

S & H LOGGING
Tualatin, OR

SAFETY KLEEN
Elgin, IL

SAFEWAY DISTRIBUTION CENTER
Clackamas, OR

SCHNITZER INDUSTRIES
Portland, OR

SEAPORT INTERNATIONAL
Issaquah, WA

SOUTHERN OREGON ASPIRE
Grants Pass, OR

SOUTHERN OREGON COMPOST
Grants Pass, OR

SOUTHERN OREGON GOODWILL
Medford, OR

SP NEWSPRINT CO
Newberg, OR

SP RECYCLING CORP
Clackamas, OR

ST VINCENT DEPAUL
Eugene, OR

STAPLES
Framingham, MA

STRATEGIC MATERIALS, INC
San Leandro, CA

STRONG METALS LLC
Tillamook, OR

STRUT
The Dalles, OR

SUPERVALU/ ALBERTSONS DIST CENTER
Portland, OR

SUPERVALU
Tacoma, WA

TAYLORMADE PRODUCTS INC
Scappoose, OR

TECHNOLOGY CONSERVATION GROUP INC
Portland, OR

THERMO FLUIDS INC
Clackamas, OR

TILLAMOOK COUNTY CREAMERY ASSOCIATION
Tillamook, OR

TIRE DISPOSAL
Molalla, OR

TIRE DISPOSAL & RECOVERY (KRIDER)
Prineville, OR

TIRE DISPOSAL & RECYCLING INC
Portland, OR

TOTAL RECLAIM INC (ECOLIGHTS NW)
Seattle, WA

TRAIL'S END RECOVERY
Warrenton, OR

TREX COMPANY
Winchester, VA

TUALATIN VALLEY WASTE RECOVERY
Hillsboro, OR

UNIFIED WESTERN GROCERS
Milwaukie, OR

UNIVERSAL RECYCLING TECHNOLOGY
Portland, OR

VEOLIA ES ENVIRONMENTAL
Vancouver, WA

WALLA WALLA RECYCLING
Walla Walla, WA

WAL-MART STORES
Bentonville, AR

WASTE CONTROL RECYCLING
Kelso, WA

WASTE MANAGEMENT LAMP TRACKER
Phoenix, AZ

WASTE RECOVERY WEST
Portland, OR

WASTE XPRESS
Portland, OR

WEST UNION GARDENS
Hillsboro, OR

WEST VANCOUVER MATERIAL RECOVERY FAC
Vancouver, WA

WESTERN OREGON UNIVERSITY
Monmouth, OR

WESTERN PULP PRODUCTS
Corvallis, OR

WESTERN RECYCLING
Boise, ID

WHITE CITY METALS AND SUPPLY
White City, OR

WHITE CITY RECYCLERS
Eagle Point, OR

WILLAMETTE LANDSCAPE SUPPLY COMPOST FACILITY
Salem, OR

WILLAMETTE RESOURCES
Wilsonville, OR

WINCO
Woodburn, OR

WOOD WASTE MANAGEMENT
Portland, OR

WOODCO FUEL
Aloha, OR

WRIGHT CHEVROLET
Fossil, OR

YAMHILL CO SOLID WASTE MANAGEMENT
McMinnville, OR

YAQUINA RECYCLING
Newport, OR

SCRAP METAL
Survey Respondents

BURCHAMS METALS
Albany, OR

DAVIS RS RECYCLING STATION
Clackamas, OR

HAMILTON METALS
Klamath Falls, OR

METRO METALS NORTHWEST
Portland, OR

PACIFIC RECYCLING
Eugene, OR

RBBG, INC
Parkdale, OR

RIVERGATE - CALBAG LLC
Portland, OR

SWIFT & MCCORMICK
Redmond, OR

WINTERS SALVAGE
Tigard, OR

COLLECTION SERVICE PROVIDER
Survey Respondents

BAKER SANITARY SERVICE
Baker City, OR

BEAVER HILL INCINERATOR & DISPOSAL SITE
Coquille, OR

BEND GARBAGE & RECYCLING CO
Bend, OR

BRANDTS SANITARY SERVICE
Monmouth, OR

C & B SANITARY SERVICE
Burns, OR

CART'M
Manzanita, OR

CASCADE RECYCLING COMPANY
Bend, OR

CENTRAL COAST DISPOSAL
Florence, OR

CITY OF CANNON BEACH
Cannon Beach, OR

CITY OF ELGIN
Elgin, OR

CITY OF HAINES
Haines, OR

CITY OF JUNCTION CITY
Junction City, OR

CITY OF LONG CREEK
Long Creek, OR

CITY OF MILTON FREEWATER
Milton Freewater, OR

CITY SANITARY SERVICE
Tillamook, OR

CLARKS DISPOSAL
John Day, OR

COBURG SANITARY SERVICE, INC
Coburg, OR

CONDON TRANSFER STATION
Condon, OR

CONFEDERATED TRIBES OF THE WARM SPRINGS
Warm Springs, OR

COOS BAY SANITARY SERVICE
Coos Bay, OR

COTTAGE GROVE GARBAGE SERVICE, INC
Cottage Grove, OR

COUNTRYSIDE DISPOSAL SERVICE
Junction City, OR

CROOK COUNTY LANDFILL
Prineville, OR

CROOKED RIVER SANITARY
Terrebonne, OR

CURRY TRANSFER & RECYCLING
Brookings, OR

D & O GARBAGE SERVICE INC
Salem, OR

DESCHUTES RECYCLING
Bend, OR

DESCHUTES TRANSFER CO
Bend, OR

DON G AVERILL RECYCLING INC
Tillamook, OR

DOUGLAS COUNTY PUBLIC WORKS DEPARTMENT
Roseburg, OR

ECOSYSTEMS TRANSFER & RECYCLING
Veneta, OR

ENVIRONMENTAL WASTE SYSTEMS INC
St. Helens, OR

EUGENE DROP BOX
Eugene, OR

FINLEY BUTTES LANDFILL
Boardman, OR

HIGH COUNTRY DISPOSAL
Redmond, OR

HOLLIDAY ENTERPRISES
Prineville, OR

HOOD RIVER GARBAGE, RECYCLE & TRANSFER
Hood River, OR

HORIZON PROJECT INC
Milton Freewater, OR

HUMBERT REFUSE & RECYCLING (RAHN'S)
Milton Freewater, OR

JEFFERSON COUNTY PUBLIC WORKS DEPARTMENT
Madras, OR

JOSEPHINE COUNTY RECYCLING & TRANSFER
Grants Pass, OR

KLAMATH COUNTY SOLID WASTE MANAGEMENT
Klamath Falls, OR

KLAMATH DISPOSAL
Klamath Falls, OR

KNOTT LANDFILL
Bend, OR

LAKE COUNTY ROAD DEPARTMENT
Lakeview, OR

LAKEVIEW SANITATION
Lakeview, OR

LANE APEX DISPOSAL
Eugene, OR

LANE COUNTY SOLID WASTE DIVISION
Eugene, OR

LES SANITARY SERVICE
Coos Bay, OR

LORENS SANITATION SERVICE
Keizer, OR

MADRAS SANITARY SERVICE
Madras, OR

MALHEUR COUNTY ENVIRONMENTAL HEALTH
Vale, OR

MARION COUNTY PUBLIC WORKS - ENV SERV
Salem, OR

MARION RECYCLING CENTER INC
Salem, OR

MCKENZIE DISPOSAL SERVICE LLC
Walterville, OR

MEL'S SANITARY SERVICE
Tygh Valley, OR

MID OREGON RECYCLING
Bend, OR

NESTUCCA VALLEY SANITARY
Hebo, OR

NORTH BEND SANITATION
North Bend, OR

NORTH LINCOLN SANITARY SERVICE
Lincoln City, OR

NORTH MARION RECYCLING & DISPOSAL
Keizer, OR

OAKRIDGE SANI-HAUL INC
Oakridge, OR

ONTARIO SANITARY SERVICE INC
Ontario, OR

OREGON WASTE SYSTEMS INC
Arlington, OR

PACIFIC SANITATION
Salem, OR

PENDLETON SANITARY SERVICE, INC
Pendleton, OR

PINE VALLEY RECYCLING COMMITTEE
Baker City, OR

R-SANITARY SERVICE
Garibaldi, OR

RECOLOGY ASHLAND SANITARY SERVICE
Ashland, OR

RECOLOGY WESTERN OREGON
Astoria, OR

RECOLOGY WESTERN OREGON
McMinnville, OR

REGIONAL DISPOSAL CO
Seattle, WA

REPUBLIC SERVICES – ALBANY
Albany, OR

REPUBLIC SERVICES – CORVALLIS
Corvallis, OR

REPUBLIC SERVICES – DALLAS
Dallas, OR

REPUBLIC SERVICES – SALEM
Salem, OR

REPUBLIC SERVICES – GRANTS PASS
Grants Pass, OR

REPUBLIC SERVICES MARION COUNTY
Woodburn, OR

ROGUE DISPOSAL & RECYCLING, INC
Central Point, OR

ROSEBURG DISPOSAL CO
Roseburg, OR

ROYAL REFUSE SERVICE
Eugene, OR

RYAN MILLER & SONS DISPOSAL SERVICE
Heppner, OR

S & S DISPOSAL
Nyssa, OR

SANIPAC INC
Eugene, OR

SANITARY DISPOSAL INC
Hermiston, OR

SOURCE RECYCLING
Albany, OR

SOUTH LINCOLN RECYCLING CENTER
Waldport, OR

SOUTH UMPQUA DISPOSAL SERVICE
Myrtle Creek, OR

SOUTHERN OREGON SANITATION INC
Grants Pass, OR

STAR GARBAGE SERVICE
Eugene, OR

SUBURBAN GARBAGE SERVICE
Salem, OR

SUNRISE ENTERPRISES
Roseburg, OR

SUTHERLIN SANITARY SERVICE
Sutherlin, OR

SWEET HOME SANITATION SERVICE
Sweet Home, OR

THE DALLES DISPOSAL SERVICE
The Dalles, OR

THOMPSONS SANITARY SERVICE
Newport, OR

TOLEDO RECYCLING AND TRANSFER
Toledo, OR

TRIBAL ENVIRONMENTAL RECOVERY FACILITY
Pendleton, OR

VALLEY LANDFILLS INC
Corvallis, OR

VALLEY RECYCLING AND DISPOSAL, INC
Salem, OR

WADSWORTH GARBAGE DISPOSAL SERVICE
Coquille, OR

WALLOWA COUNTY PUBLIC WORKS
Enterprise, OR

WASCO COUNTY LANDFILL
The Dalles, OR

WASTE MANAGEMENT – NEWBERG
Newberg, OR

WASTE MANAGEMENT OF COLUMBIA COUNTY
St. Helens, OR

WASTE PRO (CITY GARBAGE SERVICE)
La Grande, OR

WEST COAST RECYCLING AND TRANSFER
Coos Bay, OR

WHEELER COUNTY COURT
Fossil, OR

WILDERNESS GARBAGE & RECYCLING SERVICE
La Pine, OR

WINSTON SANITARY SERVICE
Winston, OR

METRO COLLECTION SERVICE PROVIDER
Survey Respondents

ALOHA GARBAGE CO
Aloha, OR

ARROW SANITARY (WASTE CONNECTIONS)
Portland, OR

BLISS SANITARY SERVICE
Boring, OR

CANBY DISPOSAL CO
Canby, OR

CITY OF ROSES DISPOSAL & RECYCLING
Portland, OR

CITY SANITARY SERVICE
Portland, OR

CLACKAMAS GARBAGE CO
Milwaukie, OR

CLOUDBURST RECYCLING
Portland, OR

CORNELIUS DISPOSAL SERVICE
Cornelius, OR

DEINES, MEL SANITARY SERVICE INC
Milwaukie, OR

DEYOUNG SANITARY SERVICE
Portland, OR

ECKERT SANITARY SERVICE INC
Portland, OR

ELMERS SANITARY SERVICE
Portland, OR

FLANNERY'S DROP BOX SERVICE
Fairview, OR

GARBARINO DISPOSAL SERVICE INC
North Plains, OR

GLADSTONE DISPOSAL CO INC
Oregon City, OR

GRESHAM SANITARY SERVICE INC
Gresham, OR

GRUETTER SANITARY SERVICE
Portland, OR

HEIBERG GARBAGE SERVICE
Portland, OR

HILLSBORO GARBAGE DISPOSAL
Hillsboro, OR

HOFFMANN SANITATION
Portland, OR

HOMEFORWARD HOUSING AUTHORITY OF PORTLAND
Portland, OR

HOODVIEW DISPOSAL & RECYCLING
Canby, OR

LEHL DISPOSAL INC
Canby, OR

MOLALLA SANITARY
Oregon City, OR

MULTNOMAH COUNTY DROP BOX SERVICE
Portland, OR

OREGON CITY GARBAGE CO
Oregon City, OR

PAPASADERO JF & SONS
Portland, OR

PORTLAND DISPOSAL & RECYCLING
Portland, OR

PRIDE DISPOSAL
Sherwood, OR

RECOLOGY PORTLAND INC (AGG)
Portland, OR

RENU RECYCLING SERVICES
Milwaukie, OR

REPUBLIC SERVICES – CLACKAMAS/WASHINGTON
Wilsonville, OR

REPUBLIC SERVICES = LAKE OSWEGO
Sherwood, OR

REPUBLIC SERVICES – PORTLAND
Portland, OR

RIVER CITY ENVIRONMENTAL
Portland, OR

ROCKWOOD SOLID WASTE INC
Gresham, OR

SANDY TRANSFER STATION
Sandy, OR

SUNSET GARBAGE COLLECTION INC
Portland, OR

SWATCO SANITARY SERVICE
Banks, OR

TRASHCO
Portland, OR

TWELVE MILE DISPOSAL SERVICE
Corbett, OR

VALLEY WEST REFUSE DISPOSAL INC
Aloha, OR

WACKER DAVE SANITARY
Boring, OR

WALKER GARBAGE SERVICE
Portland, OR

WASHINGTON COUNTY DROP BOX
Hillsboro, OR

WASTE MANAGEMENT INC
Portland, OR

WASTE MANAGEMENT OF WASHINGTON COUNTY
Portland, OR

WEISENFLUH SANITARY SERVICE
Portland, OR

WEITZELS GARBAGE SERVICE & RECYCLING
Portland, OR

WEST LINN REFUSE & RECYCLING INC
Canby, OR

WEST SLOPE GARBAGE SERVICE
Portland, OR

WICHITA SANITARY SERVICE
Gladstone, OR

WOODFEATHERS, INC
Beaverton, OR

DISPOSAL SITE
Survey Respondents

ANT FLAT LANDFILL
Enterprise, OR

BAKER SANITARY LANDFILL
Baker City, OR

BROWNS ISLAND DEMOLITION LANDFILL
Salem, OR

BURNS/HINES
Burns, OR

CHEMULT DISPOSAL SITE
Klamath Falls, OR

COFFIN BUTTE SANITARY LANDFILL
Corvallis, OR

COLUMBIA RIDGE LANDFILL & RECYCLING
Arlington, OR

CROOK COUNTY LANDFILL
Prineville, OR

DELTA SAND & GRAVEL DEMOLITION LANDFILL
Eugene, OR

DIAMOND DISPOSAL SITE
Burns, OR

DREWSEY DISPOSAL SITE
Burns, OR

DRY CREEK DISPOSAL SITE
Medford, OR

ENERGY RECOVERY FACILITY
Salem, OR

FIELDS DISPOSAL SITE
Burns, OR

FINLEY BUTTES LANDFILL
Boardman, OR

FRENCHGLEN DISPOSAL SITE
Burns, OR

HAINES LANDFILL
Haines, OR

HILLSBORO LANDFILL
Hillsboro, OR

HUMBERT SANITARY LANDFILL
Milton-Freewater, OR

JOE NEY DISPOSAL SITE
Coquille, OR

KLAMATH FALLS LANDFILL
Klamath Falls, OR

KNOTT LANDFILL
Bend, OR

LAKE COUNTY ROAD DEPARTMENT
Lakeview, OR

LYTLE BOULEVARD LANDFILL
Vale, OR

MILTON-FREEWATER LANDFILL
Milton-Freewater, OR

ONTARIO SANITARY SERVICE INC
Ontario, OR

PRAIRIE CITY LANDFILL
Prairie City, OR

REGIONAL DISPOSAL COMPANY
Seattle, WA

REGIONAL TIRE RECOVERY AND DISPOSAL
Prineville, OR

RILEY DISPOSAL SITE
Burns, OR

RIVERBEND SANITARY LANDFILL
McMinnville, OR

ROSEBURG LANDFILL
Roseburg, OR

SALEM AIRPORT DISPOSAL SITE
Salem, OR

SHORT MOUNTAIN LANDFILL
Eugene, OR

WASCO COUNTY LANDFILL
The Dalles, OR