



The Florida Legislature

OFFICE OF PROGRAM POLICY ANALYSIS AND
GOVERNMENT ACCOUNTABILITY



SUNSET MEMORANDUM

Report No. 07-S31

Department of Environmental Protection, Division of Waste Management Options for Legislative Consideration

February 15, 2008

Summary

To support the Sunset Review process, the Legislature directed OPPAGA to assess waste management activities conducted by the Department of Environmental Protection's Division of Waste Management. This memo provides information about the division's purpose, organization, responsibilities, resources, and performance.

OPPAGA assessed eight policy options for legislative consideration. These options include retaining all of the Division of Waste Management's current functions (Option 1); eliminating or reducing funding for petroleum tank cleanup projects (Option 2); consolidating Department of Environmental Protection Storage Tank Regulation and Department of Agriculture and Consumer Services Petroleum Inspection Programs (Option 3); decreasing the number of annual petroleum tank inspections (Option 4); establishing a self-certification program for all regulated tanks (Option 5); discontinuing recycling programs (Option 6); pursuing alternative waste reduction strategies (Option 7); and increasing state procurement of recycled products (Option 8). The memo discusses the advantages and disadvantages of each option.

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Purpose, Organization, and Responsibilities

The Department of Environmental Protection's Division of Waste Management implements state and federal laws relating to recycling, pollution prevention, and solid and hazardous waste management. The division also regulates and registers aboveground and underground pollutant storage systems, including petroleum tanks. Using private contractors, the division cleans up sites contaminated with petroleum products, dry-cleaning solvents, or other hazardous wastes. The ultimate goal of waste cleanup is to provide safe, efficient, and timely clean up of contaminated sites to help ensure public safety.

The division's waste control activities help to ensure that regulated entities comply with state and federal environmental laws and programs. This is achieved through permitting, compliance verification, enforcement, inspections, investigations, assessments, and review of technical documents. The goal of these activities is to reduce the amount of waste generated or spilled, thereby reducing the number of sites requiring cleanup.

The division has three bureaus: Solid and Hazardous Waste, Waste Cleanup, and Petroleum Storage Systems.

- **The Bureau of Solid and Hazardous Waste** manages, permits and regulates solid waste and hazardous waste. The bureau is responsible for implementing Florida's solid waste program, which includes permitting, compliance and enforcement activities for hazardous waste treatment, storage, and land disposal facilities. In addition, the bureau is responsible for monitoring and reporting on recycling and waste reduction programs across the state, and it provides pollution prevention assistance to businesses and local governments through outreach, technical assistance, education, training, and regulatory integration.
- **The Bureau of Waste Cleanup** is responsible for activities related to the cleanup of sites contaminated by hazardous waste including designated brownfield areas (former industrial sites) and dry-cleaning solvents. The bureau coordinates with the U.S. Environmental Protection Agency during cleanup of federal Superfund sites. In addition, it investigates ground water contamination and provides scientific and technical assistance to support recommendations used in department enforcement actions. The bureau also provides site screening services, well replacement, phase-one environmental assessments, and environmental sampling support for other department programs.
- **The Bureau of Petroleum Storage Systems** regulates and oversees inspection of over 48,000 above and underground petroleum storage tank systems. The bureau oversees 39 contracts with local governments, whose staff complete the tank inspections. In addition, the bureau oversees the clean up of sites contaminated by petroleum and petroleum product discharge and administers the petroleum cleanup program.

The division works closely with the department's six regulatory district offices and local governments to ensure statewide compliance with department rules.

Resources

In Fiscal Year 2007-08, the Legislature appropriated \$266,496,373 and 251 positions to the Division of Waste Management and \$11,336,844 and 164 positions to the department’s district offices to carry out waste management activities. The division is funded entirely through trust funds. The trust funds include the Inland Protection Trust Fund, the Permit Fee Trust Fund, the Solid Waste Management Trust Fund, the Water Quality Assurance Trust Fund, and the Grants and Donations Trust Fund. The sources of these funds include storage tank, waste tire and dry cleaner facility registration fees, excise taxes on petroleum products and other pollutants, and federal grants.

Legislative outcome measures demonstrate generally positive results, but statewide recycling goals are not being achieved

The Division of Waste Management’s legislative outcome measures demonstrate generally positive results, with most programs achieving established performance standards. However, the division has experienced ongoing difficulty achieving statewide legislative goals for residential and commercial recycling.

Legislative Performance Measures Show Generally Positive Results. The division achieved established standards for six of its eight legislatively mandated performance measures in Fiscal Year 2006-07 (measures that achieved standards are highlighted in Exhibit 1). Specifically, the division exceeded its compliance measures regarding state regulation of hazardous waste, and it is demonstrating progress cleaning up sites contaminated with petroleum and dry-cleaning solvents. For example, the cumulative percentage of petroleum-contaminated sites with cleanup completed significantly exceeded the legislative standard, with 30% of contaminated sites having completed cleanup compared to the standard of 19%. Similarly, 8% of contaminated dry-cleaning sites have completed cleanup compared to the approved standard of 5%.

**Exhibit 1
The Division Met Standards for Six of Eight Performance Measures in Fiscal Year 2006-07**

| Performance Measures | | Standard | Actual Performance |
|----------------------|--|-------------|--------------------|
| Waste Cleanup | Cumulative percentage of petroleum contaminated sites with cleanup completed | 19% | 30% |
| | Cumulative percentage of dry-cleaning contaminated sites with cleanup completed | 5% | 8% |
| | Cumulative percentage of other contaminated sites with cleanup completed | 52% | 51% |
| Water Control | Percentage of regulated solid and hazardous waste facilities in significant compliance with statutory requirements | 92% | 99% |
| | Percentage of inspected facilities that generate, treat, store or dispose of hazardous waste in significant compliance | 89% | 99% |
| | Percentage of regulated petroleum storage tank facilities in significant compliance with state regulations | 79% | 84% |
| | Percentage of non-government funded contaminated sites with cleanup completed | 45% | 50% |
| | Percentage of municipal solid waste managed by recycling/waste-to-energy/land filling | 27%/13%/60% | 25%/14%/61% |

Source: Florida Department of Environmental Protection.

However, the division reported that it did not meet its goal of cleaning up sites contaminated by substances other than dry cleaning solvents and petroleum products. According to the division, the number of known contaminated sites increases every year as new discoveries are made and accidental discharges occur. The level of effort, complexity, and time for cleanup does not always allow for the rate of site closures to keep pace with the rate of site discoveries.

In addition, the division failed to meet its legislative performance standard for the percentage of solid waste managed by recycling, waste-to-energy, and land filling. The division reported that the percentage of waste recycled did not meet the standard because it is less expensive to dispose of waste in landfills. Moreover, the division reported that recycling rates for materials found in municipal solid waste have declined nationally as well as in Florida, due in part to lower revenues generated from the sale of recyclables.

The Division Continues to Experience Difficulty Achieving Statewide Recycling Goals. Since 1998, the state and most counties have had difficulty meeting the statutorily required 30% waste reduction goal or recovered a significant portion of at least four of the minimum items mentioned in Florida Statutes; these items are aluminum cans, steel cans, plastic bottles, glass bottles, office paper, cardboard, newspaper, and yard trash. The most recently available data from the Department of Environmental Protection indicates that the statewide recycling rate for calendar year 2005 was 26%. Only 15 of Florida's 33 counties with populations over 100,000 met the statutory 30% adjusted waste reduction goal.¹

Recent statewide recycling rates are consistent with those highlighted in prior OPPAGA reports. For example, in 2002 we reported that recycling rates fell below statutory requirements and that greater recycling could potentially save money for state government and private businesses by avoiding waste disposal fee costs.² We determined that several factors contributed to the state's lack of progress in recycling, including that counties generally focused on residential rather than commercial recycling; state agencies did not recycle well; recycling services were often not available for commercial businesses; and local markets were weak for some recyclable materials. Similarly, while our 2004 progress report found that the department had taken steps to increase state agency recycling and encourage recycling in the commercial sector, the effect of these efforts on the overall statewide recycling rate was unclear, given that the rate remained below the statutory standard.³

The Division and Department of Agriculture and Consumer Services both perform petroleum-related regulatory activities

Currently, the state's system for regulating petroleum products and storage tank systems in Florida is fragmented across two state agencies—the Department of Environmental Protection (DEP) and Department of Agriculture and Consumer Services (DOACS). While their specific missions are different, both agencies perform inspections of facilities that store and sell petroleum products, including retail establishments, at a combined cost of approximately \$16 million per year.

¹ A county's unadjusted recycling rate is calculated by dividing the weight of recycled municipal solid waste by the total weight of municipal solid waste. Recycling rates are then adjusted to reflect the statute requirements for special waste. The adjusted recycling rate is determined by first calculating the percentage of special waste recycled. Divide the total weight of special wastes recycled by the total weight of all municipal solid waste. If the result is less than 15%, no adjustment is needed. If the result is greater than or equal to 15%, take the unadjusted recycling rate percent, subtract the percent of special waste recycled, and add 15%. The result will be the adjusted recycling rate.

² *Justification Review: Eliminating Recycling Grants and Raising Recycling Rates Could Save Over \$2.5 Million*, [Report No. 02-15](#), March 2002.

³ *Progress Report: Department Taking Steps to Improve State Agencies' Recycling Efforts, Encouraging Commercial Sector*, [Report No. 04-22](#), March 2004.

DEP Bureau of Petroleum Storage Systems regulates all above and underground storage tank systems to prevent accidental leakage of petroleum and other harmful substances and cleans up sites when contamination occurs. For Fiscal Year 2007-08, the department allocated the bureau approximately \$190,043,041 and 79 full-time equivalent positions to perform these functions.⁴ The bureau manages the Florida Petroleum Cleanup Program, which encompasses the technical oversight, management, and administrative activities necessary to prioritize, assess, and cleanup sites contaminated by discharges of petroleum and petroleum products from stationary petroleum storage systems. To date, the department reported that over 10,293 sites have been cleaned up, and the department is actively working on 6,054 sites.

The bureau also has a storage tank regulation program that helps to ensure adherence to laws and rules for underground and aboveground storage tank systems. All new and replacement storage tank systems must have secondary containment, and all remaining single-wall systems must replace their systems with secondary containment by 2010. The bureau regulates over 48,000 tanks located at 20,757 facilities. Retail facilities comprise 40% of the regulated facilities. The bureau has 39 contracts with local government environmental programs throughout the state to inspect petroleum storage tank systems; state law does not specify a frequency for storage tank inspection, however, the bureau's internal standard is to inspect 80% of regulated facilities with storage tank systems per year, which equates to approximately 16,606 facilities. Inspections include visual reviews of storage tank systems and surrounding containment and file reviews.⁵ In Fiscal Year 2006-07, contracted inspectors conducted approximately 18,456 routine compliance inspections and found 2,892 significant violations.

DOACS Bureau of Petroleum Inspection regularly conducts inspections at retail gas facilities of petroleum distribution systems and collects samples of petroleum products to ensure that consumers receive quality products at a fair measure. For Fiscal Year 2007-08, the department allocated the bureau \$5,546,881 and 86 full-time equivalent positions to perform these functions. In Fiscal Year 2006-07, bureau staff reported conducting 269,966 device and product inspections at 9,173 retail and wholesale petroleum facilities; state law does not require a specific frequency for petroleum inspections, however, the bureau's internal policy is to inspect each facility once every 18 months.^{6,7} Inspections include calibrating tests (i.e., comparing fuel amounts collected from pump to state standards using precision lab equipment), review to ensure proper installations and maintenance of measuring devices and attached equipment, testing for water and debris, and labeling of petroleum dispensers; the bureau conducts price-gouging investigations. In the Fiscal Year 2006-07, more than 99% of the samples bureau inspectors collected and analyzed from statewide retail fuel facilities met standards. The bureau reported handling 4,446 petroleum-related consumer complaints during this period and investigated 78 price-gouging complaints.

In general, the petroleum-related inspection functions of the Department of Environmental Protection and Department of Agriculture and Consumer Services serve the common public purpose of protecting Florida's consumers and visitors. In addition, the two agencies have inspection jurisdiction over some of

⁴ Program staff includes 117 contracted local inspectors that are trained to assess the integrity of petroleum storage tanks.

⁵ Typically, visual inspections includes verification of placard onsite, proper maintenance of tank, secondary containment, and drain valve, verification of manual overfill protection in proper working order and verification of monitoring system. A typical file review involves review of financial responsibility certificate, monthly records, monitoring system checks, cathodic protection system checks, and hydrostatic piping tests.

⁶ The number of inspections varies widely by retail outlet and is a function of the equipment and configuration at each station, including the different types of fuel offered for sale.

⁷ According to the bureau, because of these inspections, 3,187 pumps were taken out of service because of improper calibration and 30,318 correction notices were issued for poorly maintained pumps.

the same facilities (e.g., retail outlets). However, the petroleum-related activities of the two departments have different statutory objectives that require different expertise. DEP’s program ensures that petroleum storage tank systems are not leaking at facilities with underground and aboveground storage tank systems containing pollutants and hazardous substances that could endanger public health, while the DOACS petroleum program focuses on consumer economic protection, helping to ensure high fuel quality and accuracy for dispensers at retail sales facilities.

Options for Legislative Consideration

Exhibit 2 below presents eight options for the Legislature to consider for the Division of Waste Management. These options include retaining all of the Division of Waste Management’s current functions (Option 1); eliminating or reducing funding for petroleum tank cleanup projects (Option 2); consolidating Department of Environmental Protection Storage Tank Regulation and Department of Agriculture and Consumer Services Petroleum Inspection Programs (Option 3); decreasing the number of annual inspections of petroleum tanks (Option 4); establishing a self-certification program for all regulated tanks (Option 5); discontinuing recycling programs (Option 6); pursuing alternative waste reduction strategies (Option 7); and increasing state procurement of recycled products (Option 8). The exhibit also describes the advantages and disadvantages of each option.

**Exhibit 2
 The Legislature Could Consider Several Options to Modify Division of Waste Management Activities**

| Option | Advantages | Disadvantages |
|--|---|---|
| Option 1 – Retain the Division of Waste Management | | |
| Retain the Division of Waste Management and its current functions related to recycling, pollution prevention, solid and hazardous waste management, and cleanup of sites contaminated with petroleum products, dry-cleaning solvents, or other hazardous wastes. | <ul style="list-style-type: none"> ▪ Would help ensure the implementation of state and federal laws relating to recycling, pollution prevention and solid and hazardous waste management ▪ Would help ensure that the state continues to clean up hazardous wastes and inspect facilities to protect public health ▪ Would preserve the established funding mechanism for these activities | <ul style="list-style-type: none"> ▪ The state would continue to incur full costs associated with operating division programs ▪ The current structure may not provide adequate mechanisms for coordinating petroleum-related regulatory activities across agencies |
| Option 2 – Eliminate or Reduce Funding for Petroleum Cleanup Projects | | |
| Discontinue or reduce petroleum tank cleanup funding. Currently, the divisions’ petroleum-related cleanup efforts account for 89.2% of funds appropriated for all cleanup activities. Reductions in cleanup activities could be risk-based, with projects that have the greatest potential for contamination receiving top priority for funds. | <ul style="list-style-type: none"> ▪ Would save up to \$166 million annually, depending upon the size of the reduction ▪ Natural attenuation of petroleum will occur over time without cleanup efforts, with the time for attenuation varying by the severity and location of contamination | <ul style="list-style-type: none"> ▪ Would require the department to further prioritize projects to determine which should receive funding ▪ Would delay cleanup of petroleum tank sites, which could increase the potential for health risks and environmental contamination ▪ Would encounter resistance from environmental, local government, and business stakeholders |

| Option | Advantages | Disadvantages |
|---|---|---|
| Option 3 – Consolidate DEP Storage Tank Regulation and DOACS Petroleum Inspection Programs | | |
| <p>Consolidate the Department of Environmental Protection’s (DEP) storage tank regulation program and the Department of Agriculture and Consumer Services (DOACS) Bureau of Petroleum Inspection under one agency. Under this option, the storage tank regulation and petroleum inspection responsibilities, functions, activities, staff, funding, and equipment of the two agencies would be consolidated under either DEP or DOACS. Placement of these activities with either of the two agencies has advantages and disadvantages, as described below.</p> <p>Criteria for legislative consideration in centralizing petroleum-related regulatory activities should include</p> <ul style="list-style-type: none"> ▪ cost-efficiencies and reductions in administrative and operating costs; ▪ improved coordination of staff and equipment use; ▪ centralized policymaking; and ▪ reduced duplication. | | |
| <p>Department of Environmental Protection</p> | <ul style="list-style-type: none"> ▪ Would help ensure the timely completion of clean-up projects, because DEP cleanup and compliance activities are integrally linked, with inspectors reporting contamination to department staff ▪ Would facilitate the reduction of DOACS inspector positions ▪ Would eliminate some DOACS administrative overhead and travel costs ▪ DEP’s mobile computer system could be used to upload consumer information to the DOACS server ▪ Would consolidate policy and decision making ▪ Would centralize accountability and oversight over petroleum-related regulatory activities ▪ Would eliminate duplication, which occurs primarily when two inspectors visit the same establishment | <ul style="list-style-type: none"> ▪ DEP would have to assume additional tasks at retail facilities, which would increase the amount of time it takes to perform an inspection ▪ If non-compliance were found, the lead agency would have to take enforcement action resulting in an extra trip to the facility and management of an enforcement team; for example, DEP would not investigate price gouging and would therefore have to refer such cases to DOACS for action ▪ DEP mission is not consistent with the full range of DOACS consumer protection goals ▪ May be objections from DOACS ▪ Transition from decentralized to centralized system may be difficult ▪ Could be conflicts from integrating staff from agencies with various statutory missions and goals |
| <p>Department of Agriculture and Consumer Services</p> | <ul style="list-style-type: none"> ▪ Would eliminate need for DEP local contract funding and would facilitate the reduction of local inspectors ▪ Would eliminate some DEP administrative overhead and travel costs ▪ Would consolidate policy and decision making ▪ Would eliminate duplication, which occurs primarily when two inspectors visit the same establishment | <ul style="list-style-type: none"> ▪ DOACS would have to assume additional tasks, such as inspection of all regulated storage tank systems at non-retail facilities (DEP currently regulates 12,731 non-retail facilities) and inspection of tanks containing substances other than petroleum ▪ If non-compliance were found, the lead agency would have to take enforcement action, resulting in an extra trip to the facility and management of an enforcement team; for example, DOACS would not conduct petroleum cleanup activities and would therefore have to refer such cases to DEP for action ▪ DOACS mission is not consistent with the full range of DEP environmental protection goals ▪ DEP contracts for inspection services of over 20,000 facilities, of which only 40% are retail gas facilities; local contractors may lose economies of scale with the elimination of retail facilities and could potentially cancel contracts ▪ Transition from decentralized to centralized system may be difficult due to difficulties in integrating staff from agencies with differing statutory missions and goals |

| Option | Advantages | Disadvantages |
|---|---|--|
| Option 4 – Decrease Inspection Frequency of Petroleum Storage Tank Systems | | |
| <p>Currently, DEP rules require that all regulated storage tank systems have secondary containment systems by January 1, 2010. After this deadline, the Legislature could reduce the number of annual routine inspections of petroleum storage tank systems because there is less risk to human health and the environment with secondary containment systems in place.</p> | <ul style="list-style-type: none"> ▪ Would reduce costs for annual inspections of storage tank systems ▪ After secondary containment deadline there will be a reduced risk of groundwater contamination ▪ Self-monitoring technology may help decrease the number of inspections that need to be performed | <ul style="list-style-type: none"> ▪ If reductions are made before 2010, there could be risk of unreported or unobserved petroleum discharge ▪ Based on current upgrade rates, it is likely that up to 15-20% of the remaining facilities will miss the secondary containment deadline, which will require significant re-inspection and enforcement ▪ Reducing the number of inspections may lead to higher non-compliance rates |
| Option 5 – Establish Self-Certification Program for Regulated Tanks | | |
| <p>Establish a self-certification program for all regulated tanks. The Department of Environmental Protection would certify private inspectors to perform routine inspections of regulated storage tank systems. Facility owners would be responsible for obtaining inspection services and submitting inspection reports to DEP in order to obtain/renew their license. Facility owners would incur the inspection cost. The state would retain some staff to oversee work of private inspectors and conduct re-inspections of some facilities for quality control purposes.</p> | <ul style="list-style-type: none"> ▪ Would reduce the number of state funded inspectors needed, which would decrease costs ▪ The regulated entity would be responsible for obtaining inspection services | <ul style="list-style-type: none"> ▪ Cost of self-certification would ultimately be passed to consumers ▪ Department would have to establish a process for overseeing certified inspectors and for conducting re-inspections ▪ May increase the potential for groundwater contamination if private inspectors fail to identify violations |
| Option 6 – Discontinue Recycling Programs | | |
| <p>Discontinue the two recycling programs described below.</p> <ul style="list-style-type: none"> ▪ Competitive grant program for local governments and non-profit organizations that use innovative processes and technologies for recycling and waste reduction. Grants amounted to \$1,599,500 in Fiscal Year 2006-07. ▪ Consolidated grant program for counties with populations under 100,000 for general solid waste management activities. Grants amounted to \$6,500,000 in Fiscal Year 2006-07. | <ul style="list-style-type: none"> ▪ Would save the state the cost of the recycling programs, which was \$8,099,500 in Fiscal Year 2006-07 ▪ May encourage some larger counties that have available funding to find alternative ways to implement recycling programs | <ul style="list-style-type: none"> ▪ May increase the mismanagement of solid waste, which would increase negative effects on ground and surface waters and threaten public health ▪ May increase public health risks, which ultimately increase state costs ▪ Some large counties and most small counties would discontinue their local recycling programs ▪ Would increase energy consumption as well as emissions of greenhouse gases and water pollutants ▪ Would decrease the supply of raw materials to industry ▪ Would decrease jobs in the recycling sector ¹ ▪ Would thwart the development of greener technologies ▪ Would increase the need for new landfills and incinerators |

| Option | Advantages | Disadvantages |
|--|---|---|
| Option 7 – Pursue Alternative Waste Reduction Strategies | | |
| <p>The Legislature could consider implementing alternative waste reduction programs that focus on reducing the amount of waste generated. These programs could include the following.</p> <ul style="list-style-type: none"> ▪ Increased consumer information: The Legislature could direct DEP to collect data on consumer products and report how much energy and waste they produce so that consumers can make more informed decisions when buying. The department could also be directed to inform consumers and businesses on the benefits of source reduction.² ▪ Variable-rate/unit pricing: The Legislature could direct local governments to implement a per-container fee for waste pick-up, which would charge households for each bag or can of waste they generate rather than a flat rate per month. ▪ Organics recycling: The Legislature could direct local governments to implement programs that divert yard waste from the solid waste stream. In 2005, local governments reported 3.9 million tons of yard trash collected, which accounts for 10.6% of total municipal solid waste. | <ul style="list-style-type: none"> ▪ Would facilitate long-term cost savings through reduction in landfill space and revitalization of recyclables market ▪ Would provide an incentive to consumers and manufacturers to produce less waste ▪ Would reward consumers who produce less waste with lower pick up fees ▪ Pay-as-you-throw would create a direct economic incentive to recycle more and to generate less waste- the less individuals throw away the less they pay ▪ Organics recycling keeps organic waste out of landfills; provides nutrients to soil; reduces the need for fertilizers and pesticides; suppresses certain plant diseases; increases beneficial organisms; protects soil from erosion; assists pollution remediation | <ul style="list-style-type: none"> ▪ Would likely be significant start-up costs associated with any of the initiatives ▪ Pay-as-you-throw may be unfair to certain groups, such as large families, because they produce more trash ▪ Pay-as-you-throw may have enforcement problems such as illegal diversion; however, the U.S. Environmental Protection Agency suggests that it is not as significant a problem once the program is instituted |
| Option 8 – Increase State Procurement of Recycled Products | | |
| <p>The Legislature could consider directing state agencies to substantially increase the procurement of recycled products. The Legislature could direct agencies to increase their purchase of recycled products by 10% to 25% each year, using established or new state term contracts. In addition, local governments could be allowed to purchase recycled products through these contracts.</p> | <ul style="list-style-type: none"> ▪ There is adequate existing statutory authority for state agencies to purchase such products ▪ An increase in state procurement of recycled products has the potential to revitalize the market for recyclables, making recycled products more efficient to produce and cheaper to buy | <ul style="list-style-type: none"> ▪ May increase state costs, as recycled products are often more expensive than their traditional counterparts ▪ Would require an effort by state agencies, especially the Department of Management Services as the primary procurement agency, to more thoroughly research products and services they are about to buy and establish guidelines and procurement policies |

¹ *The Florida Recycling Economic Information Study* (by R.W. Beck, Inc), found that over 32,000 people were employed in some recycling capacity in Florida with 51% of these jobs belonging to the private sector and 49% to local collection and processing. The study finds that the annual wage of a full-time recycling employee was estimated to just over \$28,000.

² Source reduction refers to any change in the design, manufacture, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they become municipal solid waste.

Source: OPPAGA analysis.