



# Office of Program Policy Analysis And Government Accountability

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Director

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## REVIEW OF SOLID WASTE MANAGEMENT LANDFILL REGULATIONS

### REPORT ABSTRACT

- Landfill regulation and the Department of Environmental Protection's enforcement activities have improved since our last review in 1989.<sup>1</sup> Although all unlined landfills have been closed, most of these sites pose a continuing threat to ground water.

### PURPOSE OF REVIEW

In this review, we evaluated the Solid Waste Management Program.<sup>2</sup> Specifically, we addressed the following questions:

- To what extent has the Department addressed problems identified in our 1989 review? and
- How is the Department addressing the threat to ground water from closed, unlined landfills?

### THE 1989 REPORT

In 1989 the Office of Program Policy Analysis and Government Accountability (then the Program Audit Division of the Office of the Auditor General) conducted a performance audit of the Solid Waste Management Program which is now administered by the Department of Environmental Protection. The audit identified widespread noncompliance with rules governing the operation of solid waste facilities and

untimely enforcement efforts. The specific findings were:

- The Department's ability to detect ground water quality standards violations resulting from landfills was limited because landfill operators did not always comply with monitoring requirements and the Department did not routinely assess the quality of monitoring data.
- The Department's enforcement efforts did not always result in the timely correction of solid waste rule violations. As a consequence the environmental risks associated with solid waste facilities can increase.

### BACKGROUND

Staff allocated to the Solid Waste Management Program by the Department total 64 full-time equivalent positions, 22 in the Tallahassee Solid Waste Section and 42 in the Department's districts. Additional Department staff spend part of their time working on solid waste management issues. For example, the Office of General Counsel assigns attorneys to work on solid waste enforcement cases.

According to Department expenditure data, the Solid Waste Management Program's expenditures for fiscal year 1994-95 total approximately \$2.9 million. In addition, \$46.9 million was passed through the program to local governments in the form of aid for solid waste management programs. Program funding (\$2.9 million) came from several sources including the Solid Waste Management Trust Fund (approximately 69%), general revenue (4%), and other trust funds (27%).

<sup>1</sup> Report No. 11198, Performance Audit of the Solid Waste Management Program Administered by the Department of Environmental Regulation, dated April 5, 1989. The Department of Environmental Regulation is now the Department of Environmental Protection.

<sup>2</sup> Solid waste is garbage, rubbish, refuse, special waste, or other discarded material including solid, liquid, semisolid, or contained gaseous material and certain sludges.

## FINDINGS

*Landfill regulation and Department enforcement actions have generally improved since our 1989 review.*

### **Stronger Environmental Standards for Landfills.**

Legislative changes to landfill laws have significantly strengthened environmental protection. In 1988, the Legislature passed the Resource Recovery and Management Act creating the Solid Waste Management Program and making several changes in landfill construction, operations, closure, and long-term care (Ch. 403, Section IV, F.S.).<sup>3</sup> The most significant change established landfill liner requirements to prevent the flow of contaminated water into the ground. The legislation required unlined landfill areas to stop accepting solid waste and begin closing proceedings. Landfills constructed or expanded after 1988 have to meet the new standards requiring landfill liners. Due to these changes the Department promulgated new rules that include regulations for the construction, operation, closure, and long-term care of solid waste landfill facilities.

### **Increased Compliance With Monitoring and Reporting Requirements.**

In addition to improved operating standards, landfill compliance with ground water monitoring and reporting requirements have increased. Ground water monitoring is the principal means of detecting contamination at solid waste disposal sites. The Department requires periodic sampling of ground water for a variety of contaminants. The results of these tests are forwarded to the Department. Our 1989 report found 83% of the landfills reviewed did not have an approved ground water monitoring plan or did not monitor ground water in accordance with their plan. All district staff we interviewed told us that current landfill facilities comply with reporting requirements regarding ground water monitoring. We also reviewed 59 of the Department's enforcement files and found no evidence of noncompliance with reporting requirements.

**Improved Enforcement Efforts.** The level of Department enforcement actions to correct solid waste violations has also improved. We reviewed a random sample of 59 of the 180 solid waste landfill enforcement cases active at the time of our review. Landfill operators have completed or are in the process of completing required actions to correct solid waste rule violations in 54 of the 59 (92%) cases. This is an improvement from our prior review when the Department had little success in closing unpermitted landfills or compelling landfill owners to address ground water contamination problems.<sup>4</sup>

### **Reliability of Ground Water Quality Monitoring Data Remains Questionable.**

The lack of confirmed reliability of the self-reported ground water quality monitoring data continues to be a problem. The Solid Waste Management Program did not have any controls to assess the accuracy of data. Until recently, staff did not routinely assess the quality of the self-reported compliance monitoring data submitted by facilities. Consequently, it was possible that errors in sampling procedures or falsification could compromise data reliability. Program staff have indicated they recognize the importance of monitoring data and the need for data verification and, subsequent to our fieldwork, have begun inspecting field sampling procedures. We reviewed the results of one recent field inspection of ground water sampling. While the facility operators have taken corrective actions, several problems were noted with the sampling procedures that compromised sample integrity. This result illustrates the importance and need for some data verification.

### **Recommendation:**

- We recommend that the Department develop a system of controls to assess the handling, processing, and reporting of ground water samples. This could be accomplished within the scope of the current compliance inspections.

<sup>3</sup> Fieldwork for our 1989 review was conducted primarily in concurrence with the passage of the new legislation. Consequently, our review occurred prior to any reasonable time frame for implementing changes due to the new legislation.

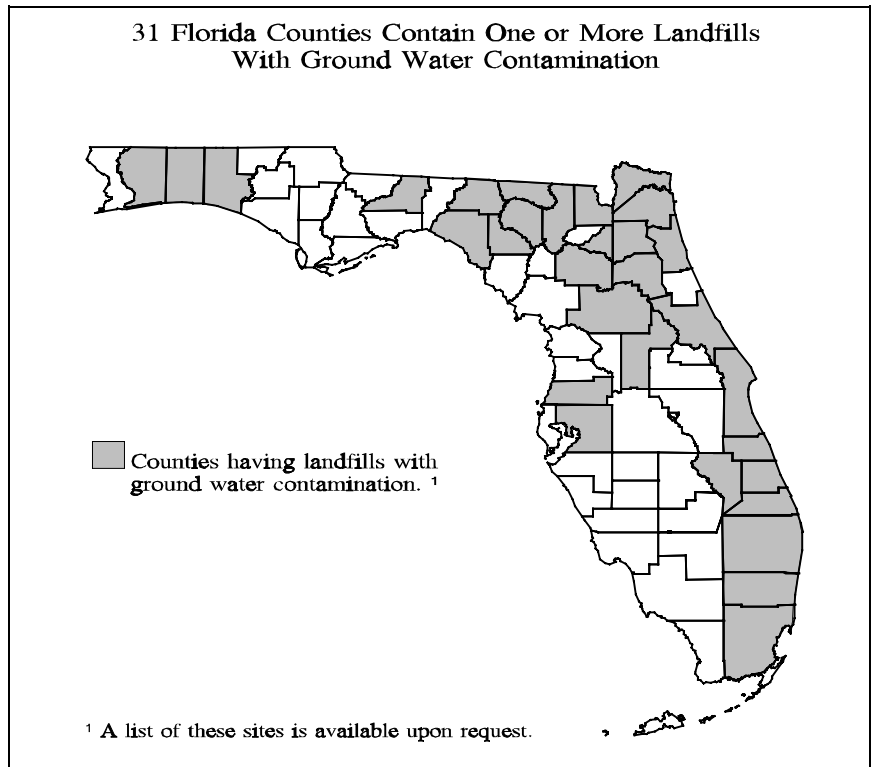
<sup>4</sup> The 1989 report examined 29 active enforcement files for landfills managed by local governments. Eighteen of the 29 cases (62%) involved the operation of landfills without a valid permit and additionally 18 of the 29 cases (62%) involved ground water contamination.

*Although current standards provide improved environmental protection, closed unlined landfills pose a continuing threat to ground water.*

Closed, unlined landfills pose a continuing threat to ground water as unlined landfills eventually leak. There are approximately 245 closed, unlined landfills, 146 of which do not have ground water monitoring. Lack of monitoring at these sites makes it difficult for the Department to identify contamination promptly. Clean-up of some of these closed landfills may pose a financial liability for the state. As of September 1995 there were 45 closed unlined landfills in 31 counties with confirmed ground water contamination. (See Exhibit 1.)

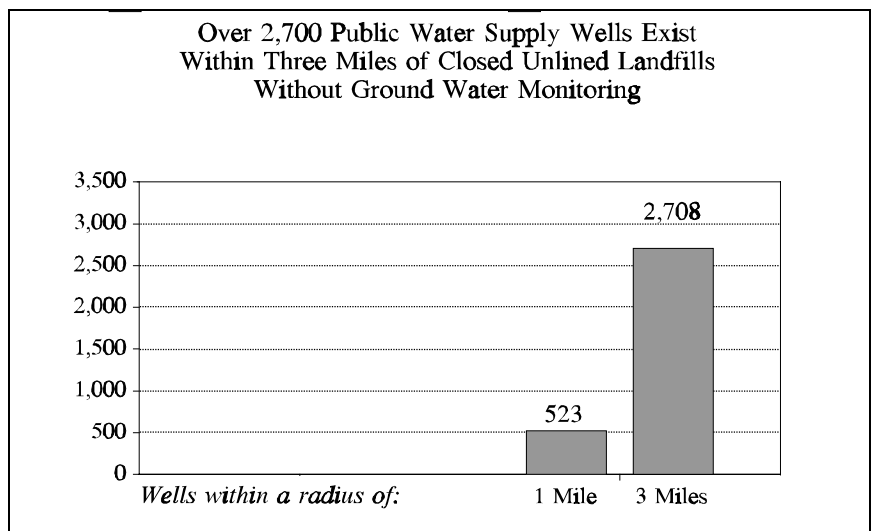
**Increased Risk of Contamination to Ground Water and Public Water Supplies.** The high probability that unlined landfills will eventually leak increases the risk of contamination of ground water and public water supplies. A number of public and private water supply wells are situated in proximity to these sites. Of the 146 known unlined closed landfill sites without ground water monitoring, there are 523 public water supply wells within a one-mile radius and over 2,700 within a three-mile radius and an unknown number of private water supply wells.<sup>5</sup> Additional risks result from the potential for hazardous waste to be part of the contamination.<sup>6</sup> Hazardous waste was not separated from the waste stream until 1980.

**Exhibit 1**



Source: Department of Environmental Protection.

**Exhibit 2**



Source: Department of Environmental Protection.

<sup>5</sup> Most plumes of contaminated ground water from landfills are less than 2 miles long with the longest a little over 3.4 miles. Ninety percent of the plumes are less than 1.5 miles in length.

<sup>6</sup> Hazardous waste is waste with physical, chemical, or infectious characteristics that may cause or significantly contribute to an increase in mortality or pose a threat to human health or the environment when improperly stored, treated, or disposed of.

**Potential Financial Liability.** Unlined landfills also present a potential financial liability to the state. The Department estimates typical landfill closure costs at about \$75,000 per acre plus costs for ground water corrective actions, if needed. Estimated closure and ground water corrective action at the nine Superfund landfill sites range from \$1.2 to \$7.3 million. The two state-funded landfill sites cost \$286,000 and \$3.3 million. Fortunately, most sites do not require ground water remediation as contamination usually does not migrate outside the site property boundary. However, the state may have to pay for the clean up of some of these sites for owners who have abandoned the sites or do not have the financial resources to monitor or clean up the sites.

The Department's program staff and scientists agree that all unlined landfills will eventually leak. However, staff believes the potential risks posed by these sites is manageable as the contaminant concentrations are controllable using current technologies. Staff do agree that a risk assessment of the potential hazards posed by unlined landfills would be beneficial. This would allow the Department to target and monitor those sites most likely to pose threats to public water supplies.

**Recommendation**

We recommend the Department develop a predictive model for targeting the closed unlined landfills that pose a risk to ground water or public water supplies. This should consider various risk factors such as the age of the landfill, the types of waste it received, its proximity to water supply wells, the hydrology of the site, and others.

Sites with high risks should be monitored to ensure ground water contamination is not occurring. Landowners of these sites are responsible for installing wells and monitoring for contamination. Where the responsible party is unable to monitor for contamination the Department should place the site on its official site investigation list. If the responsible

party is unwilling to comply with paying for the installation of wells and ground water monitoring the Department should begin enforcement action.

**AGENCY RESPONSE**

The Secretary of the Department of Environmental Protection, in her written report, concurred with the findings of this audit. The Secretary agreed that the integrity of ground water monitoring data was important and pledged to continue ongoing efforts to ensure high quality data. Additionally, it was agreed that old unlined landfills may pose a threat to the environment but the Department must balance existing resource limitations and statutory mandates before starting any new initiatives in this area.

This project was conducted in accordance with applicable evaluation standards. Copies of this report may be obtained by telephone (904/488-1023), by FAX (904/487-3804), in person (Claude Pepper Building, Room 312, 111 W. Madison St.), or by mail (OPPAGA Report Production, P.O. Box 1735, Tallahassee, FL 32302).

Web site: <http://www.state.fl.us/oppaga/>

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