

# Closed Landfill Program

2012 Report to the Legislature



Minnesota Pollution Control Agency

December 2012

## Legislative Charge

*Minn. Statutes § 115b.412, subd. 10 Report*

*By December 1 of each year, the commissioner shall report to the environment and natural resources committees and to the appropriate finance committees of the Senate and the House of Representatives on the commissioner's activities under sections 115B.39 to 115B.43 and the commissioner's anticipated activities during future fiscal years.*

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Koochiching County Landfill  
*Courtesy of Harold Slagoski*

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# Executive Summary

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The 1994 Landfill Cleanup Act (LCA) created Minnesota's Closed Landfill Program (CLP). The CLP is an alternative to Superfund for cleaning up and maintaining closed landfills and was the first such program in the nation. The CLP is unique because it is the only program that gives the Minnesota Pollution Control Agency (MPCA) the responsibility to "manage" up to 112 closed, state-permitted, mixed municipal solid waste landfills to mitigate risks to the public and the environment. The CLP manages these sites by:

- Monitoring environmental impacts and site conditions associated with each landfill.
- Determining the risk each landfill poses to public health, safety and the environment.
- Implementing remedial response actions to help reduce site risks.
- Maintaining the landfill properties, the landfill covers, and operating any remedial systems that might be present.
- Managing land issues on the land the CLP is responsible for.
- Working with local governments to incorporate land-use controls at and near the landfills to protect human health and safety, as well as the state's investment involving response actions taken and equipment purchased.
- Measuring how well the CLP is managing the risk at the landfills.

The LCA (Minn. Stat. § 115B.412, subd. 10) requires the MPCA to provide a report to the Minnesota Legislature on the activities of the previous fiscal year (FY) and anticipated future work. This report fulfills the requirement and covers FY 2012 (July 1, 2011 to June 30, 2012) activities.

The report provides detailed information on how the CLP managed the closed landfills in the program during FY 2012. The following pages give an overview of the CLP, discuss program activities that were accomplished in FY 2012, and provide a look ahead to FY 2013.

Program highlights in FY 2012 included:

- Completing or continuing major remedial response actions at nine sites.
- Completing 44 Closed Landfill Use Plans (CLUPs) with local government units.
- Preventing 28.4 million pounds of methane gas from entering the atmosphere.
- Capturing nearly 15.6 million gallons of landfill leachate by removing it from, or preventing it from reaching, the groundwater.
- CLP staff taking over certain operation and maintenance activities that saved about \$139,000 in contractual costs.

The CLP spent \$15,768,907 in contractual and administrative costs in FY 2012 to accomplish these and other activities.

Future CLP work will require additional steps to manage the risks at these sites by upgrading monitoring systems, landfill covers, and gas systems; conducting investigations; monitoring groundwater and landfill gas impacts; managing land issues; and working with local governments to implement appropriate land-use controls to protect the public using land at and near the landfills. Major construction is anticipated in the future at the Flying Cloud Landfill to address significant environmental concerns. It is estimated this construction will cost over \$20 million. This project will complete the known major construction for the CLP, with the exception of the Freeway Landfill, which does not yet have an executed Landfill Cleanup Agreement between the landfill owner and the MPCA.

The Minnesota Legislature transferred \$48 million from the Closed Landfill Investment Fund (money set aside for future post-closure care) to the General Fund to help address the state's budget shortfall during the 2010 legislative session. Legislation requires, however, that \$12 million plus interest be transferred back to the CLIF in each of four fiscal years starting in FY 2014.

# Program Overview

## Purpose

The 1994 LCA created Minnesota's CLP so the state could effectively protect human health, safety and the environment associated with 112 closed, state-permitted, mixed municipal solid waste landfills throughout Minnesota. The program's goals to help achieve this outcome include managing the risks associated with human exposure to landfill contaminants and methane gas and mitigating the degradation of groundwater and surface water. Managing these risks is best accomplished by implementing certain strategies, including (1) understanding the extent and magnitude of contaminant and methane gas impacts, as well as the overall risks, at each site; (2) maintaining the landfills and operating any remediation systems; (3) implementing construction-related response actions to reasonably address contaminant and methane gas migration issues; and (4) working with local governments to manage on-site and nearby land use. Table 1 summarizes the CLP's desired outcome, goals and strategies.

**Table 1: Outcome, goals and strategies of the CLP**

Desired outcome	Goals	Strategies
Protect human health, safety and the environment associated with closed landfills	Manage the risk. Minimize human exposure to contaminants and methane gas. Minimize degradation of groundwater and surface water.	Understand extent and magnitude of contamination and methane gas migration. Clean up and/or control groundwater contamination. Control or reduce methane gas migration. Cooperatively manage land use. Operate and maintain landfills.

The CLP manages the risk to public health and safety in a cyclical fashion referred to as the "Risk Management Cycle." First, site information pertinent to understanding the risks at each landfill is collected (monitoring groundwater, methane gas, nearby land use) and stored in a database. Second, the CLP evaluates the information, identifies the risks at each site and determines each site's numerical risk using a risk-scoring model, and identifies the most practical response actions needed to lower the risk. Third, response actions are implemented based on several factors, including risk-score ranking, available resources (funds, staff), other required site work (operation and maintenance, land surveys, repairs), and other initiatives that are agency and program priorities (e.g., renewable energy). Fourth, the response actions implemented are measured for effectiveness and the monitoring of site conditions is continued.

## How sites enter the closed landfill program

Before landfills are accepted into the CLP, certain requirements as stated in a Landfill Cleanup Agreement or Binding Agreement (BA) – typically executed between landfill owners/operators and the state – must be met. Once these requirements are fulfilled, a Notice of Compliance (NOC) is issued to the owner/operator. At this point, the site enters the program and the state takes over responsibility for the landfill.

Through June 30, 2012, 109 landfill owners/operators had executed a Landfill Cleanup Agreement and received a NOC. Currently, three landfills – Freeway, La Crescent, and Leslie Benson – are qualified for entry into the CLP but have not yet executed a Landfill Cleanup Agreement. The Freeway Landfill is of particular concern, given its rather high risk score and past failed efforts to formally enter the site into the CLP. Freeway Landfill is the only one of the three where major remedial construction is anticipated. Unless new legislation changes landfill entry requirements, the MPCA does not anticipate additional

sites to qualify for the CLP. Figure 1 shows the location of all 112 qualified facilities including the three that currently do not have a Landfill Cleanup Agreement.

The LCA also requires the CLP to reimburse eligible parties for past cleanup costs when sites enter the program. Past reimbursements to landfill owners, operators and responsible parties total \$37,107,759, while reimbursements to the U.S. Environmental Protection Agency (EPA) amount to \$4,014,550. The Freeway Landfill is the only site that remains eligible for reimbursement to the EPA, at a cost of \$17,000, when it enters the program.

## **Removing sites or land from the closed landfill program**

Legislation (Minn. Stat. §115B.412, subd. 8) was passed in 2011 that allows for the removal or delisting of landfills from the CLP and allows for portions of landfill property to be removed from MPCA responsibility when health and safety measures are met and the land is then available for other uses. Eight landfills, where waste was relocated to other landfills and where contamination isn't expected, are currently eligible for delisting consideration. However, the CLP intends to assess these sites to make sure that waste and contamination from the former landfill no longer exist. The CLP anticipates beginning assessments at some sites in FY 2013. One key step in the delisting process will likely include an agreement between the MPCA and the property owner removing the MPCA from having responsibility for any future response actions at the site.

The CLP also anticipates removing portions of other closed landfill property from program responsibility if the MPCA has no reason to take response actions on that land. In these cases, the landfill will remain in the program but some of the land will be excluded. An example of this would be where local governments or private landowners have unique land-use desires on certain property and excluding this property from the program will have no impact on the CLP's ability to care for the landfill facility and to protect public health and safety.

## **Funding**

Funding for the CLP comes from three major sources:

- the Remediation Fund
- general obligation bonds
- settlements from landfill-related insurance coverage

In addition, closed landfills with financial assurance accounts were required to deposit remaining balances into the Remediation Fund to enter the program. Also, the 3M Company provided the CLP \$8 million for perfluorochemicals (PFC)-related remedies at the Washington County Landfill per the 2007 consent agreement it has with the MPCA.

## **Transfers from the Environmental Fund**

The Environmental Fund is used to support many programs at the MPCA including, in part, the CLP. Various sources of revenue are deposited into the Environmental Fund. A portion of this fund is then transferred into the Remediation Fund for use at CLP sites and for other remediation programs.

2011 Minn. Laws, Ch. 2, Art. 1, sec. 3, subd. 7 (First Special Session) requires up to \$42 million to be transferred from the Environmental Fund to the Remediation Fund for the FY 2012–2013 biennium.



Map of Minnesota showing locations of PCB sites. The map is divided into counties, and sites are marked with dots. A legend indicates that blue dots represent 'Sites w/ Binding Agreements' and green dots represent 'Sites w/o Binding Agreements'.

Counties labeled on the map include: Northwest Angle Modified, Sault/Roseau, Karistad, Greenbush, Lake of the Woods, Koochiching County, Portage Modified, Vermillion Dam, Highway 77, Northwoods, Cook Area, Vermillion Modified, Hudson, Hoyt Lakes, East Mesaba, Mokenley, Cotton Area, Lake County, Cook County, Northome, Grand Rapids Area, Iron Range, Hibbing, Floodwood, WLSSD, Brookston, Canton South, Canton County 2, Alkin County, Hickory Grove, Crosby, Fifty Lakes, Cass Co. Oaiken-Ha, Cass Co. Longville, Leech Lake, Pickett, Becker County, Barnesville, Anderson/Sabeka, Northeast Otter, Wadena, Killian, Battle Lake, Kluver, Long Prairie, La Grand, Stevens County, Sauk Centre, Buckers #1, Buckers #2, Land Investors, St. Augusta, Benson, Paynesville, Meeker County, Chippewa County, Yellow Medicine County, Lincoln County, Redwood County, Sibley County, Minnesota Sanitation, Watonwan County, Mankato Hansen, Waseca County, Dodge County, Olmsted County, Winona County, La Crescent, Houston County, Ironwood, Adams, Red Rock, Albert Lea, Faribault County, Jackson County, Murray County, Pipestone County, Rock County, and Big Stone County.

Legend:

- Sites w/ Binding Agreements (Blue dot)
- Sites w/o Binding Agreements (Green dot)

Scale: 0 to 40 miles. North arrow pointing up.

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## General obligation bonds

General obligation bonds are used to fund capital improvements, including the construction of remedial systems and the acquisition of land, at publicly owned CLP sites. Since 1994, the Minnesota Legislature has made a number of authorizations of general obligation bonds for these activities at closed landfills, including an initial authorization of \$90 million in 1994. The 1994 authorization was intended to be available long term to meet the future capital needs of the program. However, in 2000, Minn. Stat. § 16A.642 cancelled all unused bonds more than four years old, regardless of program need or legislative intent. As a result, nearly \$56 million of the original \$90 million was cancelled. All authorizations through FY 2012, together with the cancellations, have resulted in a net authorization of over \$104 million of bonds for use at closed landfills. Through FY 2012, more than \$91 million of general obligation bonds has been spent on construction activities and land acquisitions at 52 sites.



*Sampling with a Geoprobe at Geislers Landfill, Winona County*

## Financial assurance

Minn. R. 7035.2665 requires owners of mixed municipal solid waste landfills remaining in operation after July 1, 1990, to set aside funds to pay for the cost of facility closure, postclosure care, and contingency action. Because several of the landfills that entered the CLP were still in operation as of July 1, 1990, their owners were required to meet these financial assurance rules. As part of the LCA, the owners of these landfills, upon entering the CLP, were required to transfer their financial assurance balances to the MPCA after they had met closure requirements.

From inception of the CLP through FY 2012, the state has received a total of \$15,406,837 in financial assurance payments from owners or operators of 25 closed landfills. Unless legislative changes allow additional sites to qualify for the CLP and transferring remaining financial assurance funds is required, no additional financial assurance dollars are anticipated in the future.

## Insurance recovery

The LCA authorizes the MPCA and the Attorney General's office to seek to recover a fair share of the state's landfill cleanup costs from insurance carriers based upon insurance policies issued to responsible persons who are liable for cleanup costs under the state Superfund law. This would include insurance policyholders who owned or operated the landfills, hauled waste containing hazardous substances to the landfills, or arranged for the disposal of waste containing hazardous substances at the landfills. Under the LCA, the MPCA and Attorney General may negotiate coverage settlements directly with insurance carriers. If a carrier has had an opportunity to settle with the state and fails to do so, the state may sue the carrier directly to recover cleanup costs to the extent of the insurance coverage issued to responsible persons.

The state's settlement efforts concluded in FY 2011. The state, with assistance from the state's Special Attorneys that had been appointed by the Attorney General's office, commenced a total of six lawsuits against 56 insurance companies. Although all settlements have been resolved successfully, some small payments will continue to be credited to the Remediation Fund in the future due to certain insolvent insurance carriers that were party to earlier settlements. However, the CLP does not anticipate that any significant revenue will be generated for the program. In FY 2012, four such payments, totaling \$24,392,



were credited to the Remediation Fund. Of this amount, \$2,333 was credited to the natural resources damages (NRD) account for the NRD portion of the settlements, \$11,030 was transferred to the Closed Landfill Investment Fund, and \$11,030 remained in the Remediation Fund. Through FY 2012, the state's share of all insurance carrier settlement payments totaled \$96.6 million.

Under the LCA, insurance carriers may request that the state's claims for natural resource damages (NRDs) at any of the landfills in the CLP be included in settlements with the state. NRD payments received through June 30, 2012, totaled \$9,400,934. Through its Remediation Fund Grants Program, the Minnesota Department of Natural Resources (DNR) uses NRD recoveries to rehabilitate, restore or acquire natural resources to remedy injuries or losses to natural resources resulting from a release of a hazardous substance. No grants were issued in FY 2012.

### Closed Landfill Investment Fund

In 1999, the Minnesota Legislature established the Closed Landfill Investment Fund (CLIF) for the purpose of setting aside and investing money for future postclosure care of the CLP landfills. The Legislature foresaw the need to plan for a way to fund the state's obligation to care for these landfills in perpetuity. Initially, \$5.1 million was transferred from the former Solid Waste Fund to the CLIF in each of the first four years. In addition, proceeds from settlements with insurance carriers (see **Insurance recovery** section above) were deposited equally in the Remediation Fund and the CLIF. The CLIF cannot be used to fund postclosure care activities until after Fiscal Year 2020. During the 2010 legislative session, however, the Legislature transferred \$48 million from the CLIF to the General Fund to help address the state's budget shortfall. 2010 Minn. Laws, Ch. 1, Art. 6, sec. 5, subd. 6(b) (First Special Session) requires that \$12 million plus interest be transferred back to the CLIF in each of four fiscal years starting in FY 2014. As of June 30, 2012, approximately \$3,526,080 remained in the CLIF.

## Program Activities in Fiscal Year 2012

### Fiscal Year 2012 expenditures

Program expenditures for FY 2012 totaled \$15,768,907. A summary of these expenditures is found in Table 2. Expenditures for each landfill in FY 2012 are itemized in Appendix A.

**Table 2. Closed landfill program expenditures**

Expenditure type	FY 2012	Cumulative
Closed Landfill Program administration and support	\$ 2,182,986	\$ 39,699,087
Remedial response actions*	\$ 9,060,128	\$189,920,106
Operation and maintenance	\$ 4,088,768	\$ 61,267,525
Land management	\$ 361,889	\$ 608,517
CLP legal counsel (Attorney General)	\$ 75,136	\$ 2,468,765
Insurance recovery legal counsel (Attorney General)	\$ 0	\$ 3,220,882
Insurance recovery legal counsel (special attorneys)	\$ 0	\$ 43,030,219
EPA reimbursement	\$ 0	\$ 4,014,550
Responsible party reimbursements	\$ 0	\$ 37,107,759
<b>Total</b>	<b>\$15,768,907</b>	<b>\$381,337,411</b>

Expenditure information is based on MAPS and SWIFT data for the time period July 1, 2011, to June 30, 2012.

\*These activities include both Bond and non-Bond expenditures.

## Collecting site information

Site risks are evaluated by monitoring groundwater, surface water, and landfill gas migration. Currently, the CLP samples nearly 3,000 monitoring points comprised of monitoring wells, gas probes and wells, residential wells, surface waters, piezometers and springs. These data are stored in a database referred to as the “Environmental Data Management System.” Routine inspections are also conducted at each landfill. Site conditions are observed and items needing repair are noted. In addition, any nearby development that is observed is recorded.

## Understanding and evaluating site risks

Site information that is collected is evaluated to help ascertain risks at each site. Minn. Stat. § 115B.40, subd. 2 requires the MPCA to establish and update a priority list for preventing or responding to releases of hazardous substances, pollutants and contaminants or decomposition gases at closed landfills. The CLP uses a scoring model to determine risk at each site. Landfills are scored based on hazards present at each site (monitoring data and field observations), the conditions that exacerbate those hazards (example: subsurface conditions), and the likelihood the public will be exposed to those hazards (distance to wells and buildings, population density). Landfills with high risk scores receive a high ranking or priority.



*Liner Drainage Layer Installation at Koochiching County Landfill*

The CLP updated its risk priority list in January 2012 by rescoring the landfills and identifying response actions that will help reduce the risk scores at sites (see Table 3). The response actions identified ranged from constructing new liners and covers to installing gas vents and implementing CLUPs (see **Local land use controls** below). This list was used, in part, to establish CLP work priorities in FY 2013. For some landfills, remedial response actions had already been completed and the remedies undertaken were simply monitored for remedy effectiveness. For these sites, risk scores are expected to decrease over time. For example, the Washington County Landfill, once ranked number one on the priority list, is ranked number 15 on the January 2012 list after monitoring shows that the remedy implemented has significantly reduced risk.

It is important to point out that not all CLP response actions that are undertaken are necessarily reflected in the risk priority list because not all such response actions, particularly construction activity, is directly risk related. For example, it may be necessary to replace an aging active gas system, leachate-collection system, or equipment or parts — even at landfills that have a low risk score and ranking.

## Response actions taken

Various response actions were taken in FY 2012 to address the risks posed by the closed landfills. These actions included implementing remedial response actions that were focused on reducing risks at the sites and were based on, in part, the risk priority list. Response actions also included operation and maintenance activities at all the landfills.

### Remedial response actions

The CLP takes remedial response actions at landfills to help manage the risks — as well as to lower the risk priority scores — at closed landfills. Remedial response actions taken at closed landfills in FY 2012

**Table 3. Site risk priority list (Top 30) – January 2012**

<b>Priority ranking</b>	<b>Landfill</b>	<b>Risk score</b>	<b>Initial response action completed or needed to lower risk score</b>	<b>Status</b>
1	Hopkins	65390	Construct remedy to relocate waste away from adjacent property; construct new cover and gas wells.	FY 2013
2	Lindala	25190	Partner with LGU to control land uses on/off landfill.	Ongoing
3	Waste Disposal Engineering (WDE)	23735	Install C3 VOC extraction system and monitor effectiveness of PCB extraction system at hazardous waste pit.	FY 2013 / Ongoing
4	Freeway	21140	Relocate waste on constructed lined cell or construct new cover and active gas system with waste in place.	No binding agreement
5	Becker County	15383	Partner with LGU to control land uses on/off landfill.	Ongoing
6	Western Lake Superior Sanitary District (WLSSD)	10820	Monitor effectiveness of waste relocation, upgraded cover, and active gas-extraction system.	Ongoing
7	Korf Bros.	9570	Partner with LGU to control land uses on/off landfill.	Ongoing
8	Dodge County	8875	Partner with LGU to control land uses on/off landfill.	Ongoing
9	Houston County	7103	Feasibility study to address gas concerns; install device to create negative pressure in gas vent.	Completed
10	East Bethel	7066	Partner with LGU to control land uses on/off landfill.	Ongoing
11	Crosby American Properties	6920	Monitor effectiveness of passive gas vent installation near property boundary.	Ongoing
12	Red Rock	6740	Complete groundwater investigation/test pits.	FY 2013
13	Mille Lacs County	6095	Partner with LGU to control land uses on/off landfill.	Ongoing
14	Isanti-Chisago	5406	Partner with LGU to control land uses on/off landfill.	Ongoing
15	Washington County	5365	Monitor effectiveness of relocating waste on triple-lined cells.	Ongoing
16	Flying Cloud	5200	Upgrade cover and active gas system.	FY 2014
17	Carlton County No. 2	5020	Construct new potable wells for adjacent residents. Partner with LGU to control land uses on/off landfill.	Ongoing / Ongoing
18	La Crescent	4910	Install gas probes to monitor possible presence of methane.	No binding agreement
19	Pine Lane	4685	Partner with LGU to control land uses on/off landfill.	Ongoing
20	Bueckers #1	4570	Update/correct current gas data.	Ongoing
21	Maple	4451	Partner with LGU to control land uses on/off landfill.	Ongoing
22	Woodlake	4090	Investigate gas migration on north; install passive gas vents and probes if needed.	FY 2014
23	Kummer	3760	Partner with LGU to control land uses on/off landfill.	FY 2013
24	Ironwood	3690	Enhance groundwater pumpout.	FY 2013
25	Anoka-Ramsey	3684	Partner with LGU to control land uses on/off landfill.	Ongoing
26	Stevens County	3520	Install gas probes near transfer station.	FY 2013
27	Louisville	3302	Partner with LGU to control land uses on/off landfill.	Ongoing
28	Paynesville	3260	Partner with LGU to control land uses on/off landfill.	FY 2013
29	Albert Lea	3141	Monitor effectiveness of waste relocation.	Ongoing
30	Pickett	2761	Partner with LGU to control land uses on/off landfill.	Ongoing

included cover construction, waste consolidation, and installation of active and passive gas systems. Table 4 summarizes these activities and their costs.

The CLP uses contractors to help complete some of these response actions. One contract involves investigation, designing response actions, and providing construction oversight. A second contract is for drilling services.

**Table 4: Remedial response actions in FY 2012**

<b>Landfill</b>	<b>Remedial response action</b>	<b>Expenditures (\$)</b>
Anoka-Ramsey	Ongoing modifications to the groundwater treatment system.	157,433
East Mesaba	Ongoing construction of new cover, passive gas vents, and incorporating relocated waste.	2,694,071
Flying Cloud	Ongoing design of new cover and waste consolidation.	85,131
Hopkins	Initiated design of new cover and active gas system.	40,824
Koochiching County	Ongoing construction of new cover and improved leachate-collection system.	2,223,429
Paynesville	Completed relocation of waste from an adjacent unpermitted dump to the landfill.	311,592
Washington County	Completed construction for relocating waste on site into lined cells; drinking water response actions to address PFCs are ongoing.	2,391,940
WDE	Completed pilot of soil vapor/cryogenic extraction system for the hazardous waste pit and began design of permanent system.	130,758
WLSSD	Completed contract closeout for cover/gas system construction in FY 2011.	1,024,950
<b>Total</b>		<b>\$9,060,128</b>

## Operation and maintenance

The MPCA is responsible for the long-term care of all CLP landfills in perpetuity. Depending on the site, operation and maintenance (O&M) activities include mowing, sampling and analysis, inspections, general repair and maintenance, providing and maintaining alternative water supplies or water-treatment systems, and operation of active gas- and groundwater-treatment systems. Operation and maintenance costs totaled about \$4.1 million in FY 2012. Costs for each site are provided in Appendix A.

Some of the costs shown are for invoices paid in FY 2012 and are not necessarily total project costs. Many of the operation and maintenance (O&M) activities are performed by firms under contract with the state. One contract is for routine operation and maintenance activities, a second is for sampling and analytical services, a third is for mowing the landfills, and a fourth is for leachate collections and disposal.

In FY 2012, the CLP piloted a project where CLP staff took over the O&M activities that had previously been performed by state active remediation contractors. The purpose was to evaluate whether some of the CLP's O&M work could be completed more effectively and at a lower cost if performed by CLP staff. The landfills chosen for this pilot included Cook County, Dakhue, Kummer, and Mille Lacs County landfills, and to a lesser extent, Northeast Ottertail and Isanti-Chisago landfills. The pilot study resulted in a savings to the state of almost \$139,000. The CLP's business plan for O&M takeover estimates a possible savings of about \$275,000 in FY 2013.



*Landfill Buffer at French Lake Landfill, Wright County*

## **Alternative energy opportunities**

The CLP occasionally gets involved with opportunities for alternative energy because of two important resources it has at its landfills: methane gas and open space. Landfill gas can sometimes be used as a boiler fuel or to produce electricity. Open space at some landfills can be conducive for constructing and operating solar energy farms.

While three landfills have been used as sources of electricity, these efforts were short term because of significant decreases in the volume of usable methane over time as well as high maintenance costs. The MPCA and a solar panel contractor entered into a lease agreement in FY 2011 as part of a pilot project at the Olmsted County (Oronoco) Landfill to explore the feasibility of operating solar panels on top of CLP landfills. However, because an agreement between the solar contractor and the electrical provider has not been reached, the solar farm has not been constructed.

## **Local land use controls**

Managing the risks associated with the closed landfills not only involves cleanup and long-term operation and maintenance, but also managing land use on and near the landfills so that persons living or working nearby can do so in a safe manner. Since it is unlikely that a reasonable cleanup effort will eliminate all the risks associated with a landfill, proper management and regulation of land use at and near a closed landfill is an additional important factor in assuring long-term protection from the risks posed by the facility. Future use of property at and around closed landfills needs to be planned carefully and responsibly. Because managing land use is the responsibility of local government units (LGUs), an effective partnership between the CLP and LGUs is critical.

For each landfill, the MPCA is required to develop a Closed Landfill Use Plan (CLUP) in which the MPCA (1) determines the appropriate land uses at the landfill where the MPCA is implementing environmental response actions and (2) provides information about property at or near the landfill that may be affected by groundwater and/or methane gas migration. The purpose of each CLUP is to (1) protect the health and safety of those living on, or occupying land near, the landfill and (2) protect the integrity of the landfill and the MPCA's response action equipment.

Minn. Stat. § 115B.412, subd. 9 requires LGUs to make their local land use plans consistent with the MPCA's CLUP. The CLP will specifically identify land uses it designates for the property described in the Landfill Cleanup Agreement, property with adjacent waste, adjacent buffer property, and adjacent property where response-action equipment is operated. The CLP will identify a "closed landfill management" use over all of the property to reflect the CLPs obligation to take response actions anywhere on the property. The CLP also has a policy to try to incorporate alternative energy uses (solar energy farm, wind energy conversion) where such uses are compatible with site conditions. In addition, the CLP will try to include land uses the landowner or LGU desire for the property. The MPCA will recommend that LGUs adopt a new zoning district — "Closed Landfill Restricted" — and ordinance for these properties that will reflect the land uses it has identified.

Minn. Stat. § 115B.412, subd. 4 (Affected Property Notice) requires the MPCA to provide LGUs with information that describes the types, locations and potential movement of hazardous substances, pollutants and contaminants, or methane gas related to the landfill. LGUs are required to incorporate this information in their land use plans and to notify persons applying for a permit to develop affected property of the existence of this information and, on request, to provide them a copy of the information. In addition, the MPCA will work with LGUs to identify appropriate land-use controls (example: building setbacks) on affected properties outside the landfill that best protect public health and safety.

The CLP considers a CLUP complete when it meets with the LGU to discuss the risks associated with the landfill, potential and appropriate land uses on the landfill property, and land-use controls the LGU should consider to protect public health and safety. In FY 2012, the CLP completed CLUPs at 44 landfills.

Through June 30, 2012, 77 CLUPs had been completed. Implementation of a CLUP is when the LGU amends its zoning ordinance and/or adopts other land-use controls based on the information provided by the MPCA. Through June 30, 2012, LGUs implemented seven CLUPs.

### **Land ownership**

CLP landfills are owned by local governments, the state, or are privately owned. As of June 30, 2012, the MPCA owned 30 landfills totaling 2,203 acres across Minnesota. Acquiring ownership of landfills is done in cases where state ownership provides the best method of controlling access and to help manage the facility. In many cases, the previous owner of the property transferred title to the MPCA upon entry of the site into the CLP. In other cases, the state acquires title to the land when the property goes tax forfeiture. In FY 2012, the CLP acquired 15 acres of the Barnesville Landfill when the City of Barnesville transferred ownership to the MPCA. The CLP is in the process of acquiring title, at no cost, to a number of other landfills in the program.

In addition to the landfill property itself, the MPCA sometimes acquires adjacent property as a buffer to protect public health and safety. As of June 30, 2012, 487 acres of adjacent buffer at 21 sites are under state ownership. In FY 2012, 6.2 acres of land adjacent to the Barnesville Landfill was purchased at a cost of \$17,500 because it contained landfill waste. The CLP also acquired 0.6 acres of tax-forfeited land next to the Isanti-Chisago Landfill for \$1,311 that also had CLP response action equipment on it. In addition, 3.6 acres were purchased for \$750 at the Koochiching Landfill to take certain response actions. The CLP is currently working on acquiring property adjacent to the Hoyt Lakes and Hansen landfills as buffer because landfill waste is on these properties.

Although rare, the CLP occasionally transfers state ownership of land to others when it no longer needs the land for response actions. This can be done through a surplus process or through friendly condemnation. In FY 2012, two acres at the Anoka-Ramsey Landfill were conveyed to the Anoka County Highway Department under a friendly condemnation which resulted in a \$56,000 payment to the state. Appendix B provides a list of closed-landfill property owned by the state at the end of FY 2012.

### **Helping make land available for useful purposes**

As risks at landfills are better understood or are mitigated over time, the CLP realizes that some of the land it has certain responsibilities on (through easements, restrictive covenants, Landfill Cleanup Agreements) isn't critical to meet its obligations. At the same time, local governments sometimes have desires for certain land uses on those same properties. When situations like these arise, the CLP will consider reducing some of the land it is responsible for. The CLP has authority to do this under Minn. Stat. § 115B.412, subd. 8. Although no such reductions occurred in FY 2012, the CLP is working on reducing some of the acreage at several landfills it is responsible for.

Also, there are opportunities for the state to lease the land it owns to others for certain uses, as long as state general obligation bonds were not used for response actions. The CLP currently leases either land or buildings at the Lindenfelser (garage for storage), Olmsted County (aero-modeling club, solar energy farm), and Sun Prairie (cropland) landfills.



*Trenching for Leachate Drain at Koochiching County Landfill*



Contractual costs associated with land-management activities, including property record searches, property boundary surveys, as well as costs for land purchases, totaled \$361,889 in FY 2012. These are broken down by landfill in Appendix A.

## **Measuring progress**

The MPCA staff uses environmental and other indicators to measure the progress of the CLP. Currently, two environmental indicators are measured: (1) the volume of landfill leachate that is removed from, or is collected before it has a chance to impact, groundwater and (2) the amount of landfill gas emissions that are captured and destroyed. Both, if left unabated, have the potential to cause risk to public health and the environment. However, new measures are being considered that may better reflect the program's overall management of risk at the closed landfills.

### **Leachate reduction**

Landfill leachate is the liquid that has percolated through solid waste. This leachate contains extracted, dissolved or suspended materials from the solid waste. Some of the response actions completed at closed landfills have removed leachate from groundwater or have significantly reduced the amount of leachate that could reach the groundwater. Completely eliminating leachate generation at unlined landfills is impossible given current technology, knowledge and economics. However, several activities can be done to reduce the amount of leachate each landfill generates, thereby minimizing the potential impact leachate can have on groundwater. Those activities include relocating poorly covered waste and waste originally placed in or near groundwater, reducing waste footprints, placing impermeable covers over waste, and collecting and treating leachate and contaminated groundwater. In certain situations, although expensive, constructing a bottom liner and relocating the waste on top of that liner can provide the greatest safeguard to protecting public health and the environment. To date, waste placement on a complete or partial bottom liner system has been completed at the Mille Lacs County, Washington County, and Winona County landfills.

Improved or synthetic covers greatly reduce the infiltration of precipitation into the waste, thereby reducing the volume of leachate produced. The CLP has implemented cover enhancements at more than 50 closed landfills since inception of the program. The CLP also re-contours landfill surfaces, establishes vegetative growth on landfill covers, and constructs holding basins to further reduce the amount of surface water likely to come into contact with waste and form leachate. The CLP also operates 10 leachate-collection systems and six groundwater-collection systems at 16 sites. These systems prevented an estimated 15.6 million gallons of leachate from reaching, or remaining in, the groundwater in FY 2012 (see Table 5).

### **Landfill gas reduction**

Landfill gas, primarily methane, is a concern with closed landfills because (1) it can migrate off site and become an explosive hazard and (2) it is a greenhouse gas. Methane is generated as landfill waste decomposes and needs to be managed because it accumulates beneath the landfill cover and can migrate beyond the cover. Currently, most landfills in the CLP have some type of passive or active gas-extraction system that helps alleviate methane buildup and migration.

It is not currently possible to completely eliminate landfill gas escaping to the environment. However, installation of active gas-collection systems at larger sites can significantly reduce landfill gas emissions

**Table 5. Volume of leachate prevented from reaching or remaining in groundwater in FY 2012**

Landfill	Type of system	Volume pumped (gallons)	% Leachate	Leachate (gallons)
Albert Lea	Leachate collection	498,000	100	498,000
Anoka–Ramsey	Groundwater treatment	88,616,262	1	886,163
Becker County	Groundwater treatment	175,797,197	1	1,757,972
Cook County	Leachate collection	287,000	100	287,000
East Bethel	Groundwater treatment	40,602,723	1	406,027
Isanti–Chisago	Groundwater treatment	15,372,865	1	153,729
Ironwood	Groundwater treatment	5,109,810	1	51,098
Koochiching County	Leachate collection	2,052,500	10	205,250
Mille Lacs County	Leachate collection	47,000	100	47,000
Northeast Otter Tail County	Leachate collection	23,859	100	23,859
Olmsted County	Leachate collection	654,000	100	654,000
Washington County	Leachate collection	3,487,999	100	3,487,999
WDE	Groundwater treatment	48,562,260	4	1,942,490
Winona County	Leachate collection	210,000	100	210,000
WLSSD	Leachate collection	222,148,400	2	4,442,968
Woodlake	Leachate collection	519,328	100	519,328
<b>TOTAL</b>				<b>15,572,883</b>

directly to the atmosphere. In FY 2012, 21 landfills had active gas-extraction systems or flares in operation. In addition, the solar-powered, single-vent flare at the Kummer Landfill that destroys methane is unique. Installation of these solar vent flares are being considered at other passively vented landfills in FY 2013.

Active landfill gas-extraction systems and flares provide the following beneficial uses:

- reduction in methane migration and vegetative loss
- overall reduction in greenhouse gases
- reduction of volatile organic compounds that would otherwise migrate to groundwater
- gas-to-energy use

In FY 2012, over 28 million pounds of methane were destroyed by the gas-extraction systems at CLP landfills (see Table 6). This is a significant increase over the FY 2011 total, and is due primarily to the installation of new flares at the WLSSD and Washington County landfills. Since 2000, these systems have prevented about 314 million pounds of methane (2.99 million metric tons of carbon dioxide equivalents) from entering the atmosphere. Stack test results from recent studies show about 99.9 percent destruction of methane and other contaminants in the CLP's enclosed flares.



*Burning the Oak Savannah at Anoka-Ramsey Landfill, Anoka County*

### Future measurements

Additional environmental and program measurements are being considered for the future. For example, using its GIS database, the CLP can create maps showing the groundwater and methane gas impacts at each landfill and can now track changes in acreage of each landfill's groundwater plume, as well as the groundwater and methane gas areas of concern. In addition, the CLP is considering tracking the amount

**Table 6. Methane destroyed by gas-extraction and gas to-energy systems in FY 2012**

<b>Landfill</b>	<b>Gas flow (cfm)</b>	<b>% Methane in landfill gas</b>	<b>Operation hours</b>	<b>Methane destroyed (lb)</b>
Albert Lea	135	53	5,865	1,119,687
Anoka-Ramsey	184	40	8,681	1,727,139
Becker County	57	32	3,456	168,508
Dakhue	95	22	4,757	269,391
East Bethel	72	32	8,641	523,148
Flying Cloud	407	46	8,712	4,360,049
Grand Rapids	75	41	5,728	467,697
Hopkins	182	27	1,802	234,954
Kummer (solar flare)*	1	25	4,380	2,927
Lindenfelser	81	43	7,776	723,987
Louisville	266	47	7,761	2,577,137
Oak Grove	78	53	8,484	922,748
Olmsted County	183	44	7,141	1,544,023
Pine Lane	91	44	8,731	942,995
St. Augusta	77	43	6,929	606,138
Tellijohn	127	22	7,231	527,791
Washington County	170	61	8,617	2,396,501
Watsonwan County	71	38	5,530	392,895
WDE	108	46	8,784	1,171,600
Winona County	80	51	6,003	653,427
WLSSD	270	51	8,205	3,023,576
Woodlake	379	46	8,705	4,056,832
<b>TOTAL</b>				<b>28,413,150</b>

\*Estimated

of acres of impacted land (the groundwater and methane areas of concern) that become subject to local land use controls that protect public health and safety. This will provide the program a way to measure how well its response actions are affecting the size of the environmental impacts from the landfills while, at the same time, measure how well the public's exposure to these impacts via land use is being managed. The CLP is also considering tracking the cumulative total of all site risk scores from year to year, which would reflect a change in overall risk over time.

## Looking Ahead to FY 2013

### Anticipated new projects

In FY 2013, the CLP will implement response actions at sites with high risk priority scores and to repair or upgrade existing remedial and monitoring systems. Table 7 lists the anticipated major response actions at specific landfills, assuming funding is available. Additional activities for FY 2013 include ongoing partnerships with several LGUs to control land uses on/off the landfill, and to maintain water-treatment units on private residential wells near the Becker County, Kluver, Lindala, Maple, Mille Lacs County, and Washington County landfills.

**Table 7. Anticipated major response actions for FY 2013**

<b>Landfill</b>	<b>Response action</b>
Anoka-Ramsey	Complete upgrades to the groundwater treatment system.
Carlton County #2	Install new drinking water wells for four residences.
East Mesaba	Complete waste consolidation and cover construction.
Flying Cloud	Begin construction of new cover and active gas-extraction system.
Hopkins	Relocate waste away from adjacent property. Upgrade cover and active gas system.
Koochiching County	Complete an upgrade of leachate collection system and cover.
Kluver	Begin repairs to the cover, address drainage issues, and reconstruct road.
Maple	Install new drinking water wells for three residences.
Red Rock	Conduct groundwater investigation.
WDE	Complete installation of a granular activated carbon system to address PCB contamination. Install cryogenic vapor extraction system at hazardous waste pit.

## Additional Information

Additional information about the CLP, including landfill-specific information, can be found on the MPCA's website at <http://www.pca.state.mn.us/0agx803>.

For more information about the CLP, contact:

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- **Doug Day**, Unit Supervisor, Closed Landfill Program, 651-757-2302, 800-657-3864
- **Jeff Lewis**, Section Manager, Closed Landfill and Superfund Programs, 651-757-2529, 800-657-3864

## Appendix A: Fiscal Year 2012 site costs

Landfill Name	Risk Priority Rank	MPCA Salary and Expenses	Attorney General Support	Operation & Maintenance *	Design / Construction *	Land Management *	Landfill Total
Adams (Relocated)	105	\$ 45	\$ 0	\$ 0	\$ 0	\$ 0	\$ 45
Aitkin Area	61	\$ 1,536	\$ 62	\$ 5,676	\$ 0	\$ 4,641	\$ 11,915
Albert Lea	29	\$ 3,678	\$ 246	\$ 128,695	\$ 0	\$ 0	\$ 132,619
Anderson-Sebeka	83	\$ 1,508	\$ 0	\$ 8,065	\$ 0	\$ 25,814	\$ 35,387
Anoka-Ramsey	25	\$ 21,953	\$ 1,439	\$ 323,885	\$ 157,433	\$ 33,779	\$ 538,489
Barnesville	64	\$ 2,924	\$ 3,469	\$ 3,518	\$ 0	\$ 17,081	\$ 26,992
Battle Lake	91	\$ 3,072	\$ 0	\$ 3,827	\$ 0	\$ 0	\$ 6,899
Becker County	5	\$ 5,092	\$ 0	\$ 128,861	\$ 0	\$ 0	\$ 133,953
Benson	93	\$ 2,214	\$ 2,743	\$ 10,807	\$ 0	\$ 0	\$ 15,764
Big Stone County	100	\$ 4,558	\$ 1,833	\$ 14,823	\$ 0	\$ 9,452	\$ 30,666
Brookston Area	78	\$ 821	\$ 0	\$ 2,883	\$ 0	\$ 1,800	\$ 5,504
Bueckers #1	20	\$ 1,895	\$ 160	\$ 7,464	\$ 0	\$ 1,599	\$ 11,118
Bueckers #2 (Relocated)	108	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Carlton County #2	17	\$ 15,288	\$ 37	\$ 46,674	\$ 0	\$ 3,425	\$ 65,424
Carlton County South	68	\$ 2,457	\$ 221	\$ 3,178	\$ 0	\$ 18,166	\$ 24,022
Cass County (L-R)	81	\$ 1,272	\$ 0	\$ 252	\$ 0	\$ 0	\$ 1,524
Cass County (W-H)	51	\$ 1,418	\$ 0	\$ 3,618	\$ 0	\$ 0	\$ 5,036
Chippewa County	89	\$ 1,461	\$ 0	\$ 10,796	\$ 0	\$ 0	\$ 12,257
Cook Area	57	\$ 287	\$ 0	\$ 3,570	\$ 0	\$ 0	\$ 3,857
Cook County	95	\$ 4,708	\$ 98	\$ 48,993	\$ 0	\$ 0	\$ 53,799
Cotton Area	101	\$ 1,102	\$ 0	\$ 2,364	\$ 0	\$ 0	\$ 3,466
Crosby	79	\$ 2,154	\$ 0	\$ 15,640	\$ 0	\$ 0	\$ 17,794
Crosby American Properties	11	\$ 5,563	\$ 1,845	\$ 72,232	\$ 0	\$ 2,050	\$ 81,690
Dakhue	80	\$ 6,915	\$ 209	\$ 14,489	\$ 0	\$ 16,743	\$ 38,356
Dodge County	8	\$ 2,829	\$ 0	\$ 7,199	\$ 0	\$ 46	\$ 10,074
East Bethel	10	\$ 6,643	\$ 37	\$ 151,674	\$ 0	\$ 3,059	\$ 161,413
East Mesaba	36	\$ 24,012	\$ 332	\$ 460	\$ 2,694,071	\$ 0	\$ 2,718,875
Eighty Acre	72	\$ 1,567	\$ 25	\$ 12,634	\$ 0	\$ 0	\$ 14,226
Faribault County	67	\$ 2,548	\$ 0	\$ 10,498	\$ 0	\$ 0	\$ 13,046
Fifty Lakes	42	\$ 4,105	\$ 12	\$ 4,603	\$ 0	\$ 0	\$ 8,720
Floodwood	77	\$ 828	\$ 0	\$ 2,566	\$ 0	\$ 2,200	\$ 5,594
Flying Cloud	16	\$ 11,423	\$ 6,285	\$ 18,292	\$ 85,131	\$ 0	\$ 121,131
Freeway (No BA)	4	\$ 11,430	\$ 5,683	\$ 0	\$ 0	\$ 0	\$ 17,113
French Lake	103	\$ 777	\$ 0	\$ 3,224	\$ 0	\$ 0	\$ 4,001
Geislars (Relocated)	107	\$ 1,119	\$ 0	\$ 0	\$ 0	\$ 0	\$ 1,119
Gofer	58	\$ 1,934	\$ 0	\$ 10,104	\$ 0	\$ 92	\$ 12,130
Goodhue Co-Op	62	\$ 496	\$ 25	\$ 1,522	\$ 0	\$ 0	\$ 2,043
Grand Rapids	48	\$ 3,477	\$ 49	\$ 77,975	\$ 0	\$ 0	\$ 81,501
Greenbush (Relocated)	109	\$ 441	\$ 0	\$ 0	\$ 0	\$ 0	\$ 441
Hansen	59	\$ 2,466	\$ 0	\$ 3,064	\$ 0	\$ 0	\$ 5,530
Hibbing	75	\$ 1,813	\$ 0	\$ 5,449	\$ 0	\$ 3,000	\$ 10,262
Hickory Grove	87	\$ 2,292	\$ 0	\$ 8,570	\$ 0	\$ 0	\$ 10,862
Highway 77	50	\$ 2,160	\$ 0	\$ 2,336	\$ 0	\$ 0	\$ 4,496
Hopkins	1	\$ 21,127	\$ 234	\$ 68,271	\$ 40,824	\$ 0	\$ 130,456
Houston County	9	\$ 1,405	\$ 0	\$ 15,171	\$ 0	\$ 0	\$ 16,576
Hoyt Lakes	47	\$ 4,350	\$ 0	\$ 1,965	\$ 0	\$ 13,548	\$ 19,863
Hudson	38	\$ 809	\$ 0	\$ 5,100	\$ 0	\$ 0	\$ 5,909
Iron Range	73	\$ 1,245	\$ 0	\$ 5,260	\$ 0	\$ 0	\$ 6,505
Ironwood	24	\$ 3,513	\$ 0	\$ 121,054	\$ 0	\$ 0	\$ 124,567
Isanti-Chisago	14	\$ 6,300	\$ 86	\$ 120,430	\$ 0	\$ 21,414	\$ 148,230
Jackson County	74	\$ 3,227	\$ 0	\$ 9,234	\$ 0	\$ 0	\$ 12,461
Johnson Bros.	34	\$ 1,027	\$ 0	\$ 2,290	\$ 0	\$ 8,223	\$ 11,540

Landfill Name	Risk Priority Rank	MPCA Salary and Expenses	Attorney General Support	Operation & Maintenance *	Design / Construction *	Land Management *	Landfill Total
Karlstad	55	\$ 951	\$ 1,845	\$ 3,077	\$ 0	\$ 8,781	\$ 14,654
Killian	88	\$ 533	\$ 0	\$ 11,825	\$ 0	\$ 0	\$ 12,358
Kluver	35	\$ 3,647	\$ 12,288	\$ 20,276	\$ 0	\$ 0	\$ 36,211
Koochiching County	32	\$ 22,609	\$ 2,952	\$ 204,102	\$ 2,223,429	\$ 7,608	\$ 2,460,700
Korf Bros.	7	\$ 3,605	\$ 3,801	\$ 18,128	\$ 0	\$ 446	\$ 25,980
Kummer	23	\$ 3,461	\$ 0	\$ 19,472	\$ 0	\$ 0	\$ 22,933
La Crescent (No BA)	18	\$ 675	\$ 246	\$ 0	\$ 0	\$ 0	\$ 921
La Grand	97	\$ 2,673	\$ 0	\$ 3,359	\$ 0	\$ 17,031	\$ 23,063
Lake County	84	\$ 1,801	\$ 0	\$ 5,566	\$ 0	\$ 0	\$ 7,367
Lake of The Woods County	60	\$ 311	\$ 0	\$ 2,805	\$ 0	\$ 0	\$ 3,116
Land Investors (Relocated)	98	\$ 306	\$ 0	\$ 2,547	\$ 0	\$ 11,882	\$ 14,735
Leech Lake	54	\$ 674	\$ 0	\$ 5,517	\$ 0	\$ 0	\$ 6,191
Leslie Benson (No BA)	33	\$ 1,827	\$ 25	\$ 0	\$ 0	\$ 0	\$ 1,852
Lincoln County (Relocated)	106	\$ 475	\$ 0	\$ 0	\$ 0	\$ 46	\$ 521
Lindala	2	\$ 4,007	\$ 0	\$ 15,723	\$ 0	\$ 12,118	\$ 31,848
Lindenfelser	71	\$ 5,214	\$ 4,674	\$ 51,762	\$ 0	\$ 10,066	\$ 71,716
Long Prairie	69	\$ 1,545	\$ 234	\$ 4,728	\$ 0	\$ 0	\$ 6,507
Louisville	27	\$ 4,854	\$ 4,600	\$ 81,342	\$ 0	\$ 0	\$ 90,796
Mahnomen County	46	\$ 1,634	\$ 2,300	\$ 378	\$ 0	\$ 12,204	\$ 16,516
Mankato	66	\$ 3,562	\$ 0	\$ 8,248	\$ 0	\$ 46	\$ 11,856
Maple	21	\$ 3,298	\$ 12	\$ 36,738	\$ 0	\$ 0	\$ 40,048
McKinley (Relocated)	111	\$ 371	\$ 62	\$ 0	\$ 0	\$ 148	\$ 581
Meeker County	92	\$ 3,467	\$ 49	\$ 13,707	\$ 0	\$ 0	\$ 17,223
Mille Lacs County	13	\$ 16,171	\$ 959	\$ 38,470	\$ 0	\$ 0	\$ 55,600
Minnesota Sanitation	82	\$ 3,154	\$ 0	\$ 4,537	\$ 0	\$ 0	\$ 7,691
Murray County	41	\$ 3,551	\$ 0	\$ 12,632	\$ 0	\$ 0	\$ 16,183
Northeast Otter Tail	63	\$ 2,832	\$ 0	\$ 33,219	\$ 0	\$ 0	\$ 36,051
Northome	96	\$ 498	\$ 12	\$ 11,457	\$ 0	\$ 4,822	\$ 16,789
Northwest Angle	52	\$ 183	\$ 0	\$ 1,213	\$ 0	\$ 0	\$ 1,396
Northwoods	99	\$ 1,066	\$ 0	\$ 5,962	\$ 0	\$ 46	\$ 7,074
Oak Grove	31	\$ 3,977	\$ 12	\$ 94,390	\$ 0	\$ 3,059	\$ 101,438
Olmsted County	37	\$ 3,090	\$ 49	\$ 118,847	\$ 0	\$ 15,052	\$ 137,038
Orr	65	\$ 386	\$ 0	\$ 0	\$ 0	\$ 46	\$ 432
Paynesville	28	\$ 18,895	\$ 0	\$ 10,590	\$ 311,592	\$ 14,737	\$ 355,814
Pickett	30	\$ 239	\$ 0	\$ 10,254	\$ 0	\$ 0	\$ 10,493
Pine Lane	19	\$ 7,100	\$ 0	\$ 80,523	\$ 0	\$ 11,729	\$ 99,352
Pipestone County	70	\$ 3,605	\$ 0	\$ 9,170	\$ 0	\$ 92	\$ 12,867
Portage Mod. (Relocated)	112	\$ 214	\$ 0	\$ 0	\$ 0	\$ 0	\$ 214
Red Rock	12	\$ 4,384	\$ 209	\$ 19,381	\$ 0	\$ 0	\$ 23,974
Redwood County	86	\$ 4,296	\$ 0	\$ 14,850	\$ 0	\$ 0	\$ 19,146
Rock County	90	\$ 4,417	\$ 0	\$ 10,588	\$ 0	\$ 0	\$ 15,005
Salo/Roseau	39	\$ 679	\$ 0	\$ 11,103	\$ 0	\$ 45	\$ 11,827
Sauk Centre	49	\$ 1,719	\$ 160	\$ 8,156	\$ 0	\$ 1,599	\$ 11,634
Sibley County	94	\$ 2,460	\$ 0	\$ 7,707	\$ 0	\$ 0	\$ 10,167
St. Augusta	45	\$ 5,111	\$ 25	\$ 74,065	\$ 0	\$ 1,599	\$ 80,800
Stevens County	26	\$ 3,259	\$ 0	\$ 2,383	\$ 0	\$ 46	\$ 5,688
Sun Prairie	104	\$ 3,126	\$ 25	\$ 7,277	\$ 0	\$ 0	\$ 10,428
Tellijohn	44	\$ 3,242	\$ 0	\$ 69,048	\$ 0	\$ 0	\$ 72,290
Vermillion Dam (Relocated)	110	\$ 150	\$ 0	\$ 881	\$ 0	\$ 0	\$ 1,031
Vermillion Modified	102	\$ 3,552	\$ 0	\$ 630	\$ 0	\$ 5,260	\$ 9,442
Wabasha County	40	\$ 4,592	\$ 443	\$ 10,422	\$ 0	\$ 15,933	\$ 31,390
Wadena County	76	\$ 2,672	\$ 25	\$ 15,316	\$ 0	\$ 1,520	\$ 19,533
Waseca County	43	\$ 5,637	\$ 25	\$ 24,008	\$ 0	\$ 0	\$ 29,670
Washington County	15	\$ 33,054	\$ 0	\$ 393,672	\$ 2,391,940	\$ 0	\$ 2,818,666



Landfill Name	Risk Priority Rank	MPCA Salary and Expenses	Attorney General Support	Operation & Maintenance *	Design / Construction *	Land Management *	Landfill Total
Watonwan County	85	\$ 4,676	\$ 0	\$ 51,996	\$ 0	\$ 92	\$ 56,764
WDE	3	\$ 41,950	\$ 2,189	\$ 377,588	\$ 130,758	\$ 3,059	\$ 555,544
Winona County	56	\$ 6,385	\$ 74	\$ 144,274	\$ 0	\$ 0	\$ 150,733
WLSSD	6	\$ 24,331	\$ 3,444	\$ 186,279	\$ 1,024,950	\$ 46	\$ 1,239,050
Woodlake	22	\$ 12,474	\$ 111	\$ 178,743	\$ 0	\$ 12,176	\$ 203,504
Yellow Medicine County	53	\$ 5,122	\$ 0	\$ 10,584	\$ 0	\$ 4,425	\$ 20,131
Administration and support		\$ 1,651,957	\$ 9,159	\$ 0	\$ 0	\$ 0	\$ 1,661,116
<b>TOTAL</b>		<b>\$ 2,182,986</b>	<b>\$ 75,136</b>	<b>\$ 4,088,768</b>	<b>\$ 9,060,128</b>	<b>\$ 361,889</b>	<b>\$15,768,907</b>

\*Contractual Costs

## Appendix B: State ownership of landfills and adjacent property

Site Name	County	Landfill Acres	Buffer Acres
Anderson/Sebeka	Wadena	27.1	
Anoka/Ramsey	Anoka	245.7	18.8
Barnesville	Wilkin	15.0	6.2
Bueckers #1	Stearns	30.8	
Dakhue	Dakota	79.8	
East Bethel	Anoka	58.3	0.3
East Mesaba	St. Louis	226.5	
French Lake	Wright	11.0	69.0
Isanti-Chisago	Isanti	64.3	0.6
Kluver	Douglas	21.4	7.4
Koochiching County	Koochiching		3.6
Kummer	Beltrami		9.1
La Grande	Douglas	70.4	
Land Investors, Inc.	Benton	8.6	
Leech Lake	Hubbard	66.2	16.5
Lindala	Wright	40.0	20.0
Lindenfelser	Wright	61.7	12.1
Long Prairie	Todd	28.0	99.6
McKinley	St. Louis	5.5	
Oak Grove	Anoka	148.8	1.2
Olmsted County	Olmsted	252.0	46.9
Paynesville	Stearns	75.9	
Pickett	Hubbard	16.2	3.8
Pine Lane	Chisago	45.7	19.4
Pipestone County	Pipestone	40.0	
Red Rock	Mower	79.7	80.5
Salol-Roseau	Roseau	101.6	
Sauk Centre	Stearns	10.8	3.2
St. Augusta	Stearns	70.8	43.0
Sun Prairie	Le Sueur	80.3	
Wabasha County	Wabasha	29.0	
Washington County	Washington		20.1
WDE	Anoka		5.5
Woodlake	Hennepin	192.2	
<b>Total</b>		<b>2,203.3</b>	<b>486.8</b>