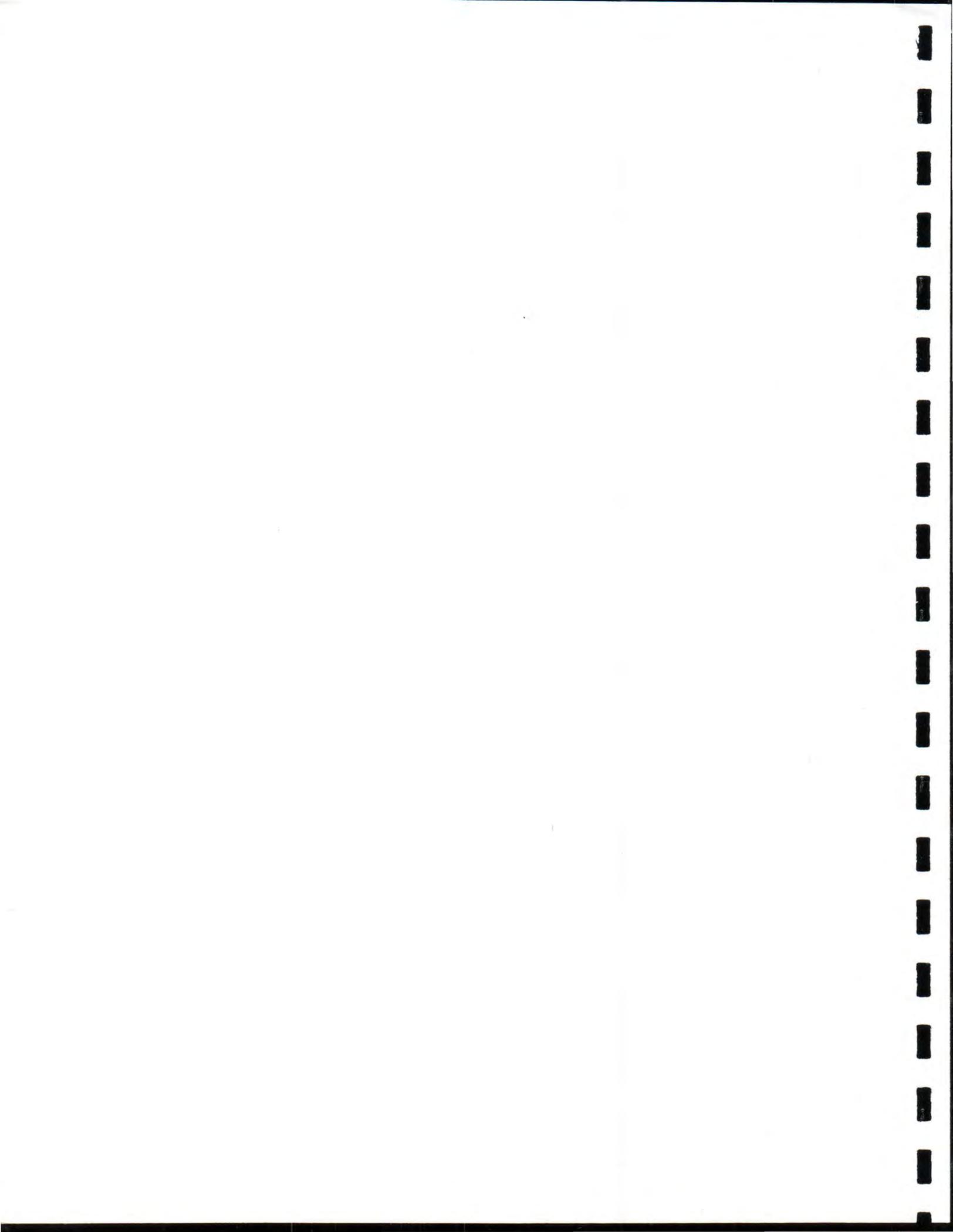




APPENDICES





Minnesota
Pollution
Control
Agency

Remediation
Division
Closed Landfill
Program

Closed Landfill Program – Land Use Plans

1.02, November, 2004

Introduction

In 1994, the Minnesota Legislature passed the Landfill Cleanup Act (LCA) which created the Closed Landfill Program (CLP). Under the CLP, the Minnesota Pollution Control Agency (MPCA) is authorized to initiate cleanup actions, complete closures, and take over the long-term operation and maintenance at over 100 closed, municipal solid waste landfills throughout Minnesota.

The Act also requires the MPCA to develop a land use plan (Minn. Stat. § 115B.412, subd. 9) for each qualified facility or landfill and requires local units of government to make their local land use plans consistent with the plans developed by the MPCA.

Contamination Issues at Landfills

Landfill gas migration and ground-water contamination can be serious issues associated with many landfills. These problems can pose a threat to the health and safety of those living, or occupying land, near these sites.

Because the MPCA is responsible for the long-term care of these landfills, the MPCA has implemented monitoring programs and corrective actions at many of the sites. The MPCA is also responsible for the operation and maintenance of the landfill cover, any remediation and monitoring systems present, as well as site security. In some cases, remediation systems need to be constructed and operated at these landfills to mitigate these gas migration and/or contamination problems.

Future Land Use

The future use of the property needs to be planned carefully and responsibly and must be compatible with the MPCA's responsibilities for the facility. The purpose of developing a land use plan at each landfill is to:

- protect the integrity of the landfill's remediation systems;
- protect human health and public safety at each landfills; and
- accommodate local government needs and desires for land use with consideration for health and safety requirements.

This can be accomplished through the adoption and implementation of a site specific land use plan that may recommend local zoning and other land-use measures. Therefore, land use plans are intended to provide valuable information to local units of government (townships, cities, counties, and Indian tribes) that have authority for local planning and zoning.

To meet the requirements of the statute, local units of government must make their land use plans consistent with the land use plans developed by the MPCA. The MPCA may recommend that local units of government consider adopting a zoning district and ordinance for the qualified facility that will be consistent and compatible with the MPCA's future obligations at the facility and, at the same time, possibly allow for certain uses of the property.



Off-site Contamination

The State statute requiring the development of a land use plan for each closed landfill does not apply to property outside of the qualified facility that may be affected by landfill gas and/or ground-water contamination. However, Minn. Stat. § 115B.412, subd.4(a) requires the MPCA to provide affected local units of government with site information including a description of the types, locations, and potential movement of hazardous substances, pollutants and contaminants, or decomposition gases related to the landfill. This information is available in the MPCA's site annual report for each closed landfill.

Furthermore, Minn. Stat. § 115B.412, Subd. 4(b) requires local units of government to incorporate this information into 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.

For More Information

If you would like more information about land use plans at closed landfills, please contact Shawn Ruotsinoja of the MPCA at (651) 282-2382 or toll-free/TTY (800) 657-3864.

You can get the specific land-management-plan legislation at the following link.

<http://www.revisor.leg.state.mn.us/stats/115B/412.html>

MPCA Web site: <http://www.pca.state.mn.us>



Waste Disposal Engineering Landfill – Closed Landfill Issues

Closed Landfill Program/#2.01/October 2005

What is the site history?

Located in Andover, the Waste Disposal Engineering (WDE) Landfill operated as a dump in the 1960s. From 1971 to 1983, it was a sanitary landfill with a Minnesota Pollution Control Agency (MPCA) permit. The site contains approximately 2,410,000 cubic yards of compacted mixed municipal solid waste and soil cover material. At the site, a permitted hazardous waste disposal pit also accepted liquid industrial and hazardous waste from 1972 to 1974. In 1974, the MPCA ordered the pit to be closed.

This landfill was placed on the U.S. Environmental Protection Agency's (EPA's) National List of Priorities (federal Superfund) in September 1983. EPA issued an administrative order requiring potentially responsible

parties to install a remediation system and place environmental controls around the landfill.

A tray stripper was constructed in 1995 to remove volatile organic compounds from the ground water that were collected prior to being discharged into the sanitary sewer.

The Closed Landfill Program

Minnesota's Closed Landfill Program (CLP) was enacted in 1994 to clean up old, leaking landfills statewide. The MPCA assumed responsibility for the WDE landfill remediation activities and long-term care once all parties signed the binding agreement and the notice of compliance was issued.

Anoka County, the MPCA commissioner, and a group of responsible parties signed the Binding Agreement for the WDE landfill in October 1995. That same month, the Notice of Compliance was issued to the parties involved with the Binding Agreement.

In March 1996, the site was deleted from the federal Superfund list by EPA because of the MPCA's 1995 agreement with EPA, the signing of the Binding Agreement and the issuance of the Notice of Compliance.

Active-Gas Extraction

In 1997, the MPCA determined that active-gas extraction would enhance





the remediation system at the WDE Landfill by removing contaminants more quickly and efficiently.

Active-gas extraction removes methane gas and other volatile compounds, preventing their migration off site. The active-gas extraction system draws gas and vapors from the buried waste through a system of wells, pipes, and a blower. The captured gas is ignited in a controlled manner inside a stack or flare. The gases are converted to simple exhaust gases (mostly carbon dioxide, water vapor, and chloride compounds).

The MPCA tested the flare stack in November 2003. The test results indicated that the flare's combustion exceeds 99.9 percent destruction of combustible organics.

What does the flare look like and how does it work?

The flare stack is typically 25 to 30 feet tall in order to contain the flame completely inside it. An insulating material lines the stack to keep the outside cool enough to touch. The blower and other controls are typically mounted on a steel frame next to the stack. A multistage blower is used to provide efficient gas movement and keep the noise level low.

What is methane and should I be worried about it?

Methane is a gas that is produced by certain bacteria as organic materials decay. It is colorless, odorless (although it usually is accompanied by other odors from the waste), and flammable. Most landfills produce methane. WDE Landfill is no exception.

Methane also can move through soil and be a problem if it makes its way into poorly ventilated house basements. If enough methane builds up inside a structure and is ignited, an explosion is possible. The WDE site has two methane barriers adjacent to the east and west boundaries to restrict methane migration to nearby properties. Some methane gas movement has been detected at the site, although no

methane has moved very far off the site at this time. An active-gas extraction system is the most reliable method to control gas migration at landfills.

What does the MPCA do to make sure the system works?

The MPCA regularly monitors all systems at the WDE site. This includes monitoring the gas flare, sampling ground-water monitoring wells for laboratory analysis three times a year, monthly monitoring of effluent from the present pump-out system, and quarterly checks on gas monitoring probes. Also, the MPCA staff or designated contractor check the site continuously for signs of trespassing and to ensure the remediation equipment is operating.

What is the citizen's role in the cleanup process?

Trespassing has been a problem at the site. Because gas and monitoring wells stick up above the surface, people that sled, snowmobile, or drive all-terrain vehicles on the WDE Landfill are in danger of being injured if they run into this equipment. Damage to the remediation equipment could also cause the systems to stop functioning. This would lead to an unsafe environment (explosive gases building up) around the landfill. The WDE Landfill is fenced and posted to prevent public access because of this danger and to protect on-site equipment.

There are also monitoring wells and gas probes located outside of the fenced-in area. This equipment is marked with three bumper posts.

Residents should keep curious or adventurous children away from the site, especially during construction activities, and report vandalism to the Anoka County Sheriff and the MPCA. Since taxpayers' dollars pay for the landfill upkeep, it is in the public interest to prevent damage to landfill cleanup systems.



Can land near closed landfills be used and developed?

Ground-water contamination and landfill gas from closed landfills can present a health and public safety threat to persons wishing to use and/or develop land near some closed landfills. The Landfill Cleanup Act (Act) requires that a land use plan be developed in order to assist local units of government to prudently manage land use and development around these landfills. Essentially, the purpose of the land use plan is to:

- Protect the integrity of the landfill's remediation systems;
- Protect human health and the environment at and around the landfill;
- Ensure that the cleanup and future operation and maintenance of the remediation systems at the landfill are successful; and

- Accommodate local government needs and desires for land use where health and safety requirements can be met.

The Act also requires local units of government to make their land-use plans consistent with the plan developed by the MPCA. These goals can be accomplished not only by the state's cleanup efforts, but also through the adoption and implementation of a site-specific land management plan through local zoning and other land-use measures consistent with public health and safety needs.

The land use plan for the WDE site should be completed in 2006.

For more information

For more information about the Closed Landfill Program, you can go to the program's Web page at http://www.pca.state.mn.us/programs/landfill_p.html

You can also call the MPCA at (800) 657-3864 and ask for the Closed Landfill Program staff associated with this site.



Potential Hazards at Closed Landfill Sites

WDE Landfill Andover, Minnesota



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To assist contractors and consultants working on closed landfill sites, the MPCA has developed this fact sheet, which describes potential occupational health and safety hazards at the WDE Landfill. The fact sheet provides general information about hazards and potential safety issues; however it may not include all potential hazards. Contractors and consultants must exercise due caution at any closed landfill site and always verify this information is complete.



This information is provided to help you keep your employees and subcontractors safe. It is your responsibility to take all prudent precautions and follow all regulations and standards pertaining to the tasks you perform at the WDE Landfill.

Location

The WDE Landfill is a 70-acre site located in the City of Andover. The main access is at the northwest corner of the facility; 14437 Crosstown Boulevard.

Physical and Biological Hazards

Potential physical and biological hazards at the site include but are not limited to:

- uneven terrain on landfill slopes hidden by long grass
- an artificial wetland with standing water and soft terrain on the west side of the site (may be frozen over in winter)
- gas-recovery wells and other wells hidden by long grass
- poison ivy or noxious weeds
- ticks and mosquitoes

Flare Stack

The landfill gas extraction system flare is not shielded, but is insulated on the inside. The surface can be very hot, creating a potential burn hazard for anyone working near it. In addition, there is a high-voltage electrical panel associated with the flare that could pose an electrocution hazard.



Ground Water Remediation Control Building

This building contains piping from each of the site's ground water extraction wells with corresponding valves, flow meters, and electrical control panels. Here, flow from each well can be directed to the treatment pond, storm water pond, or sanitary sewer. Inside, there is:

- potential for contact with contaminated ground water
- electrical hazard from the control panels



Confined Spaces

Confined spaces may contain landfill gases, including high concentrations of highly flammable methane gas. They may also be oxygen deficient. Confined space entry procedures, including atmospheric testing, should be followed before entering these spaces. Confined spaces on this site include:

- sumps and vaults for condensate and groundwater recovery wells
- hazardous waste pit vault
- outlet structure vault for treatment pond

Ground Water Treatment Pond

The ground water treatment pond detains and aerates contaminated ground water prior to discharge to the sanitary sewer. Within the fenced enclosure, there are:

- slip hazards associated with smooth geomembrane liner and formation of ice around pond perimeter during winter
- drowning hazard from deep aerated water and difficult egress up steep geomembrane covered slopes
- potential exposure to volatile organic compounds in air and water
- electrical hazard from aeration equipment control panels



Chemical Hazards

Landfill gas (LFG) is made up of approximately 50 percent methane gas, which is potentially explosive. Other corrosive and possibly toxic constituents may also be found in LFG. Ground water at this site is contaminated with volatile hydrocarbons. Condensate from the LFG extraction system may also contain low levels of hydrocarbons. Gloves should be worn when sampling or when servicing equipment used for ground water or condensate recovery and treatment.

More detailed information on chemical hazards at the WDE Landfill is provided in a summary table on the following page.

Pesticides

Due caution should be exercised where herbicides or rodenticides are used. Herbicides such as Round-up™ and Crossbow™ may be sprayed to control vegetation around the pond and flare enclosures and to control woody vegetation. Rodenticides may be used in the ground water remediation control building.

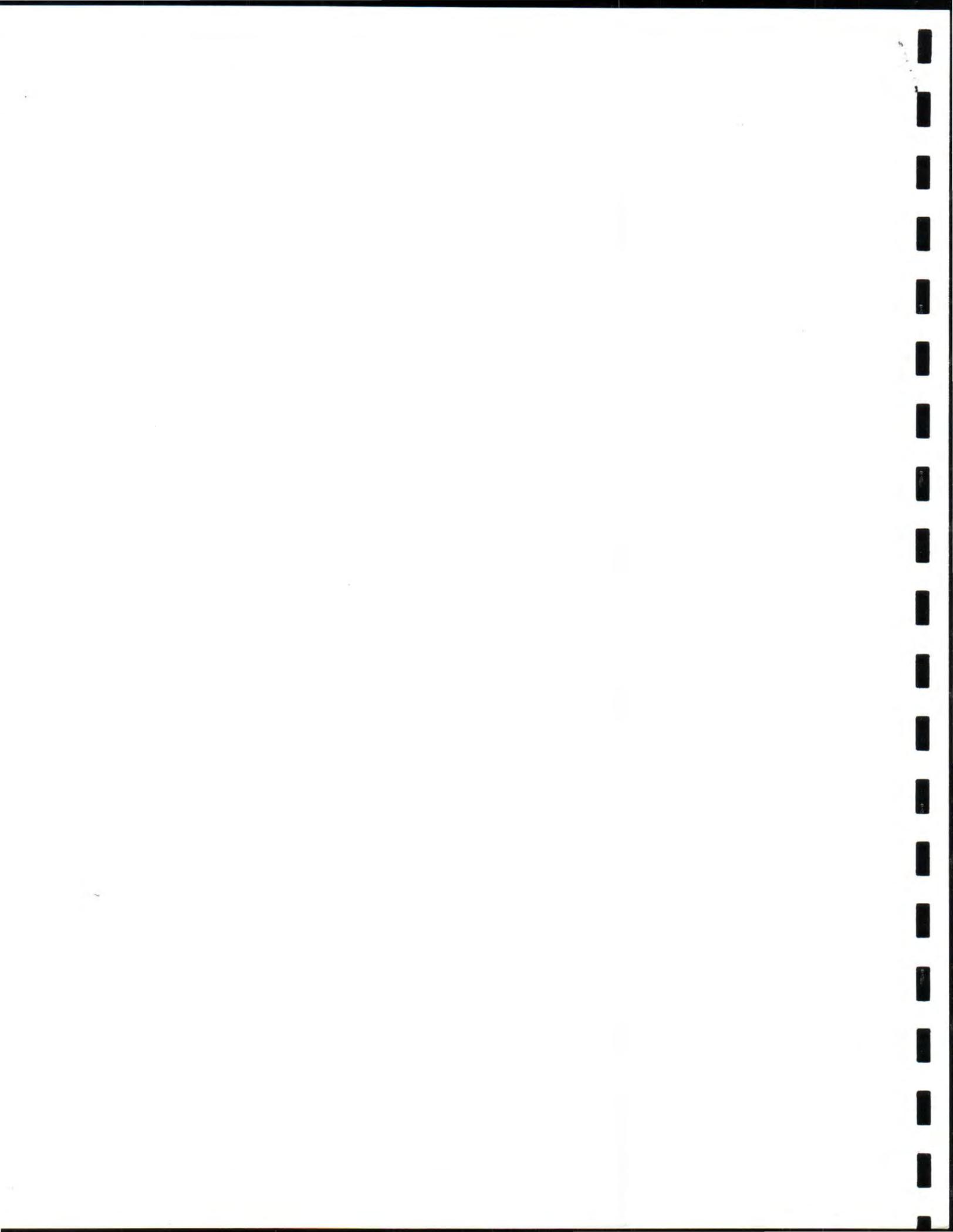
For more information

For more information on these or other potential hazards at the WDE landfill site, please contact Pat Hanson at 651-296-7740 or e-mail pat.hanson@pca.state.mn.us.

WDE Sanitary Landfill Chemical Hazards Summary Table

Compound	Standard (µg/L)		Contaminant Concentration (µg/L)		
	HRL	MCL	EW-9	Influent	Condensate
Acetone	700	-	11,000 – 48,000	<2,000 – 5,700	1,800 – 8,800
Benzene	10	5	<100	20 - 30	20 – 100
Carbon tetrachloride	3	5	<100 – 2,100	<100 – 1,600	<100 – 3,700
Chloroform	60	-	<100 - 170	<100	<100
Chlorobenzene	100	100	<100 – 110	<100	<100
Chloroethane	-	-	480 - 940	<100	<100
Dichlorodifluoromethane	1,000	-	<100 – 160	<100	<100
Dichlorofluoromethane	-	-	420 - 560	<100	<100
1,1-Dichloroethene	6	7	460 – 1,200	<100	<100
1,2-Dichlorobenzene	600	600	220 – 340	<100	<100
1,2-Dichloroethane	4	5	270 – 360	<100	<100
1,1-Dichloroethane	70	-	9,700 – 38,000	20 – 3,300	90 – 1400
cis-1,2-Dichloroethylene	70	70	34,000 – 47,000	30 – 10,000	30 – 3,900
trans-1,2-Dichloroethylene	100	100	<100 - 400	<100	<100
Ethylbenzene	700	700	2,000 – 3,100	<100 - 110	480
Methylene chloride	50	5	36,000 – 62,800	<200 – 15,000	<200 – 3,700
Methyl ethyl ketone	4,000	-	19,000 – 63,000	940 – 17,000	1,700 – 10,000
Methyl isobutyl ketone	300	-	5,700 – 8,600	<500 – 2,200	480 – 1,600
Tetrachloroethylene	7	5	110 – 4,000	30 – 3,900	21 – 260
Tetrahydrofuran	-	-	6,100 – 8,900	260 – 3,400	360 – 2,500
Toluene	1,000	1,000	20,000 – 25,200	<100 – 6,300	600 – 2,500
1,1,1-Trichloroethane	600	200	14,000 – 120,000	<100 – 29,000	30 – 5,300
1,1,2-Trichloroethane	3	5	<100 - 150	<100	<100
Trichloroethylene	30	5	2,400 – 18,700	<100 – 12,000	<100 – 770
Trichlorofluoromethane	2,000	-	<100 – 550	<100	<100
1,1,2-Trichloro-1,2,2-trifluoroethane	200,000	-	800 – 2,500	<100	<100
Vinyl chloride	0.2	2	1,400 – 22,000	82 - 880	50 – 720
2-Methyl phenol	30	-	<10	<10	27 – 57
4-Methyl phenol	3	-	<10	<10	<10 – 255
Isophorone	100	-	<10	<5 - 535	12 – 800
Xylene m&p	10,000	10,000	7,500 – 9,000	<100 - 300	940
Xylene, o	10,000	10,000	2,700 – 3,000	<100	230
Total VOCs			173,780 – 490,840	1,382 – 111,255	6,870 – 48,012
Lead		15	ND	ND	<1 – 81
Manganese	100	50	4.8 – 5.1 mg/L	ND	ND
Nickel	100	-	ND	ND	16 - 120

HRL – Health Risk Limit: Concentration of a ground water contaminant that can be safely consumed daily for a lifetime.
MCL – Maximum Contaminant Level: The maximum permissible level of a contaminant in a public drinking water system.
VOCs – Volatile organic compound.
EW-9 – Ground water from extraction well EW-9, sampled prior to mixing with “influent”.
Influent – Ground water from combined ground water extraction wells that make up the “influent” to the treatment pond.
Condensate – Liquid collected from landfill gas collection system.



DRAFT

District CLR – Closed Landfill Restricted

A. Purpose

The Closed Landfill Restricted (CLR) District is intended to apply to former landfills and adjacent lands which are managed under the Closed Landfill Program of the Minnesota Pollution Control Agency (MPCA). The purpose of the district is to limit uses of land both actively filled and related lands, to minimal uses in order to protect the land from human activity where response action systems are in place. This district shall only apply to the former landfill and pertinent adjacent lands (the limits of which are defined by the MPCA). This district shall apply whether the landfill is in public (State, MPCA, County, City, Township), Indian tribal, or private ownership.

For purposes of this ordinance, the Closed Landfill Restricted District consists of the following parcels:

PARCEL A

(P.I.D. # 27-32-24-31-0007)

All that part of the Northeast Quarter of the Southwest Quarter of Section 27 Township 32 Range 24 Anoka County, Minnesota, described as follows:

Commencing at the northeast corner of said Northeast Quarter of the Southwest Quarter, thence westerly along the north line thereof for 58.6 feet to the center line of County State Aid Highway No. 18, thence South 32 degrees 55 minutes West for 550.17 feet along said center line, thence South 44 degrees 11 minutes West for 342.85 feet along said center line, thence South 45 degrees 26 minutes East for 872.00 feet to the southeast corner of said Northeast Quarter of Southwest Quarter, thence north along the East line of said Northeast Quarter of the Southwest Quarter to the point of commencement.

Subject to an easement to R.E.A and other easements of record, if any.
Subject to the rights-of-way of C.S.A.H. No. 16 and C.S.A.H No. 18.

PARCEL B

(P.I.D. # 27-32-24-42-0001)

All that part of the Northwest Quarter of Southeast Quarter of Section 27 Township 32 Range 24, Anoka County, Minnesota, lying south of the center line of Coon Creek.

PARCEL C

(P.I.D. # 27-32-24-41-0122)

That part of Lot 29, Block 1, NATURES RUN C.I.C. NO. 96, Anoka County, Minnesota, described as:

Beginning at the Southwest corner of said Lot 29, said corner being also the southwest corner of the Northeast Quarter of the Southeast Quarter of said Section 27, Township 32, Range 24; thence along an assumed bearing of North 00 degrees 07 minutes 18 seconds West along the most westerly line of said Lot 29 a distance of 688.72 feet; thence South 79 degrees 45 minutes 19 seconds East a distance of 40.89 feet; thence South 60 degrees 04 minutes 12 seconds East a distance of 43.45 feet; thence South 43 degrees 56 minutes 49 seconds East a distance of 45.73 feet; thence South 39 degrees 44 minutes 38 seconds East a distance of 88.10 feet; thence South 40 degrees 48 minutes 57 seconds East a distance of 91.31 feet; thence South 43 degrees 00 minutes 57 seconds East a distance of 36.65 feet; thence South 29 degrees 03 minutes 59 seconds East a distance of 49.60 feet; thence South 39 degrees 08 minutes 25 seconds East a distance of 60.74 feet; thence South 53 degrees 25 minutes 00 seconds East a distance of 37.89 feet; thence South 47 degrees 52 minutes 34 seconds East a distance of 42.64 feet; thence South 41 degrees 09 minutes 22 seconds East a distance of 51.36 feet; thence South 35 degrees 56 minutes 48 seconds East a distance of 40.54 feet; thence South 27 degrees 39 minutes 19 seconds East a distance of 35.77 feet; thence South 40 degrees 14 minutes 42 seconds East a distance of 54.12 feet; thence South 47 degrees 16 minutes 27 seconds East a distance of 32.39 feet; thence South 37 degrees 37 minutes 40 seconds East a distance of 59.79 feet; thence South 34 degrees 27 minutes 40 seconds East a distance of 43.18 feet; thence South 31 degrees 05 minutes 02 seconds East a distance of 54.84 feet; thence South 48 degrees 22 minutes 53 seconds East a distance of 53.40 feet to the most southerly line of said Lot 29; thence North 89 degrees 04 minutes 22 seconds West along the most southerly line of said Lot 29 a distance of 635.88 feet to the Point of Beginning.
(As described in Quit Claim Deed filed as Anoka County Doc. No. 1649743)

PARCEL D

(P.I.D. # 27-32-24-44-0001)

The Southeast Quarter of Southeast Quarter Section 27 Township 32 Range 24, Anoka County, Minnesota.

Subject to the right-of-way of County Road No. 78.

PARCEL E

(P.I.D. # 34-32-24-11-0002)

All that part of the Northeast Quarter of Northeast Quarter of Section 34 Township 32 Range 24, Anoka County, Minnesota, described as follows:

Beginning at northeast corner of the Northeast Quarter of Northeast Quarter, thence North 89 degrees 08 minutes 39 seconds West along north line of said Northeast Quarter of Northeast Quarter 1316.94 feet to the northwest corner of said Northeast Quarter of Northeast Quarter, thence South 0 degrees 18 minutes 44 seconds West along west line of said Northeast Quarter of Northeast Quarter, 15 feet, thence South 89 degrees 08 minutes 39 Seconds east 180.52 feet, thence South 75 degrees 30 minutes 33 seconds East 190.89 feet, thence South 89 degrees 08 minutes 39 seconds East 474.80 feet, thence North 67 degrees 05 minutes 08 seconds East 111.64 feet, thence South 89 degrees 08 minutes 39 seconds East 373.94 feet more or less to a point on east line of said Northeast Quarter of

Northeast Quarter, thence North 0 degrees 15 minutes 45 seconds East along said east line 15 feet to the point of beginning, except road, subject to easement of record.

PARCEL F

(P.I.D. # 34-32-24-12-0002)

All that part of the Northwest Quarter of Northeast Quarter of Section 34 Township 32 Range 24, Anoka County, Minnesota, described as follows:

Beginning at northeast corner of said Northwest Quarter of Northeast Quarter, thence North 89 degrees 08 minutes 39 seconds West along north line of said Northwest Quarter of Northeast Quarter, 1078.71 feet, thence South 68 degrees 56 minutes 31 seconds East 402.99 feet, thence South 81 degrees 03 minutes 01 seconds East 109.56 feet, thence North 70 degrees 32 minutes 11 seconds East 198.91 feet, thence North 80 degrees 59 minutes 38 seconds East 411.73 feet more or less to a point on the east line of said Northwest Quarter of Northeast Quarter, 15 feet southerly of the point of beginning, thence North 0 degrees 18 minutes 44 seconds East along said east line 15 feet to the point of beginning, subject to easement of record.

PARCEL G

(P.I.D. # 27-32-24-43-0001)

The Southwest Quarter of Southeast Quarter of Section 27 Township 32 Range 24, Anoka County, Minnesota.

PARCEL H

(P.I.D. # 27-32-24-34-0038)

Outlot A, Kensington Estates 4th Addition, according to the recorded plat thereof, Anoka County, Minnesota.

PARCEL I

(Part of P.I.D. # 27-32-24-34-0003)

All that part of the southerly 500.00 feet of the easterly 500.00 feet of the Southeast Quarter of the Southwest Quarter of Section 27, Township 32, Range 24, Anoka County, Minnesota, described as follows: Beginning at the northeast corner of said southerly 500.00 feet of the easterly 500.00 feet, said northeast corner also being the southeast corner of OUTLOT A, KENSINGTON ESTATES 4TH ADDITION, according to the recorded plat thereof; thence on an assumed bearing of North 89 degrees 06 minutes 16 seconds West along the northerly line of said southerly 500.00 feet and the southerly line of said OUTLOT A for 87.07 feet to the southwest corner of said OUTLOT A; thence South 15 degrees 15 minutes 57 seconds East for 331.50 feet to the easterly line of said Southeast Quarter of the Southwest Quarter; thence North 00 degrees 02 minutes 26 seconds West along said easterly line for 318.44 feet to the point of beginning.

B. Permitted Uses

There are no permitted uses within the CLR District.

C. Accessory Uses

Accessory uses allowed in this district include outdoor equipment or small buildings used in concert with gas extraction systems (i.e. gas to energy system), other response action systems, monitoring wells or any other equipment designed to protect, monitor or otherwise ensure the integrity of the landfill monitoring or improvement systems. Fences and gates shall be allowed under these provisions.

D. Conditional Uses

Conditional uses shall be limited to passive uses to protect the integrity of the landfill area and to protect any person from hazards associated with the landfill. The landfill shall be planted in cover crops and shall be maintained by the MPCA.

Any proposed conditional use must be approved by the Commissioner of the Minnesota Pollution Control Agency (MPCA) and the City of Andover. Such approved use shall not disturb or threaten to disturb, the integrity of the landfill cover, liners, any other components of any containment system, or the function of any monitoring system that exists upon the described property.

E. Prohibited Uses and Structures

All other uses and structures not specifically allowed as conditional uses, or that cannot be considered as accessory uses, shall be prohibited in the CLR District.

F. General Regulations

Requirements for parking, signs, area, height and other regulations are set forth in Articles _____.