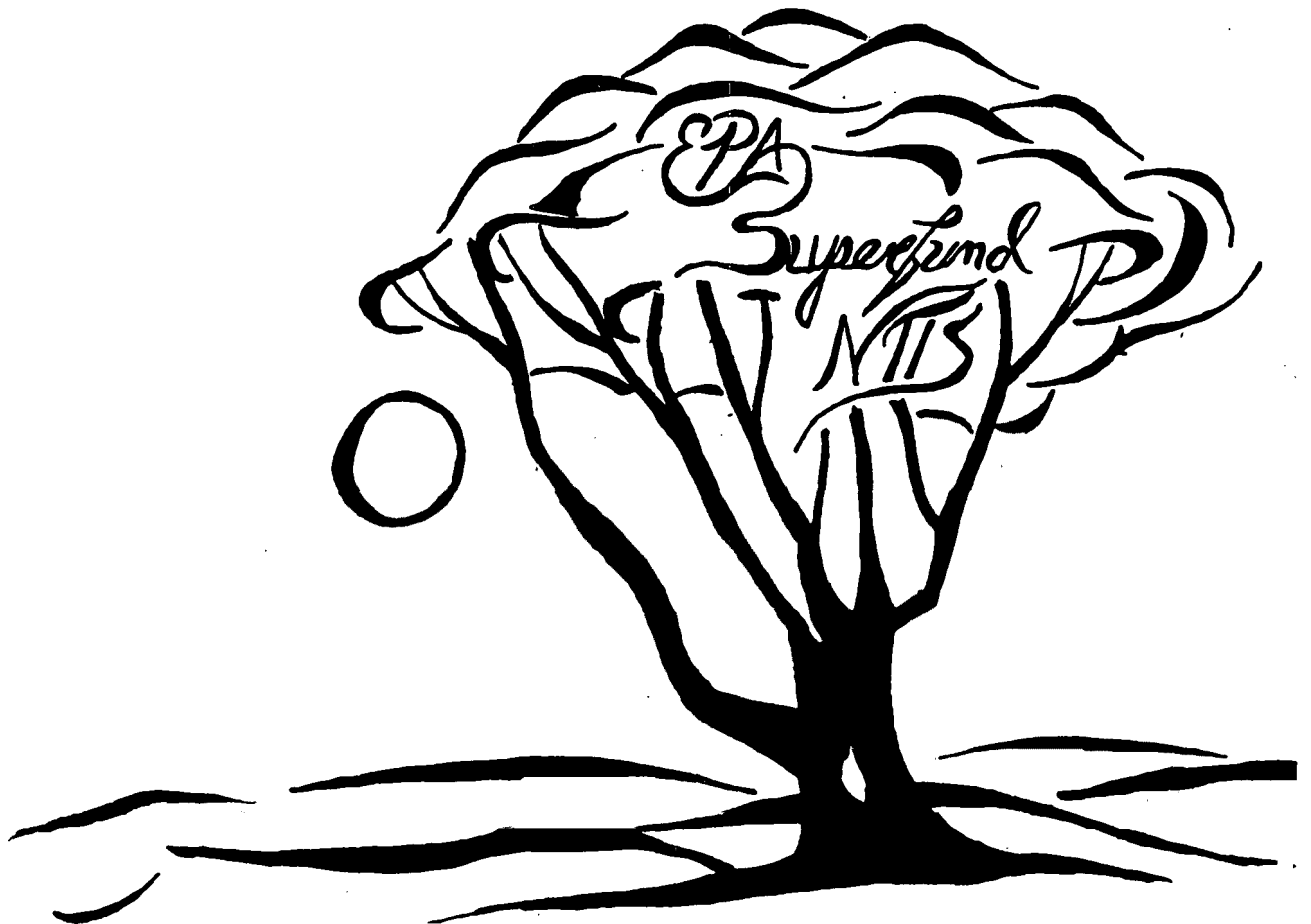


EPA Superfund Record of Decision:

**Olmsted County Sanitary
Landfill Site, Olmsted, MN,
~~6/8/1994~~**

6/21/1994



**DECLARATION OF THE RECORD OF DECISION
OLMSTED COUNTY SANITARY LANDFILL
OLMSTED COUNTY, MINNESOTA**

Site Name and Location:

Olmsted County Sanitary Landfill Superfund Site, Oronoco Township,
Olmsted County, Minnesota

Statement of Basis and Purpose:

This decision document presents the selection of the no-action remedial alternative for the Olmsted County Sanitary Landfill, Superfund Site (the Site). The selected remedial alternative was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA); as amended by Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable the National Contingency Plan (NCP). Also, the selection is consistent with the Minnesota Environmental Response and Liability Act of 1983 (MERLA).

This decision is based upon the reports, information and public comments, which constitute the Administrative Record for the Site.

The United States Environmental Protection Agency (EPA) concurs with the selected no-action remedial alternative for the Olmsted County Sanitary Landfill Superfund Site.

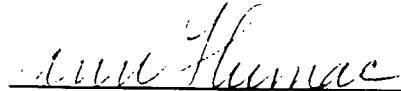
Description of the Selected Remedy:

No remedial action under CERCLA or MERLA is necessary at this site to ensure protection of human health and the environment. Potential problems associated with this site will be addressed by the Minnesota Solid Waste Landfill Compliance program, the Resource Conservation and Recovery Act and a Closure Order by Consent between the Minnesota Pollution Control Agency (MPCA) and Olmsted County. Under these programs, monitoring and review of the site will be continued to verify that no unacceptable risks posed by the site occur in the future.

The MPCA has determined, and the EPA concurs, that no further action is necessary at this site. The reason for this determination is that the source control action taken under site closure and actions implemented under the Closure Order by Consent between the MPCA and Olmsted County has eliminated potential exposure to source related contaminants. Continued monitoring of the site and implementation of contingency actions is specified in the Closure Order by Consent.

Federal and State Concurrence:

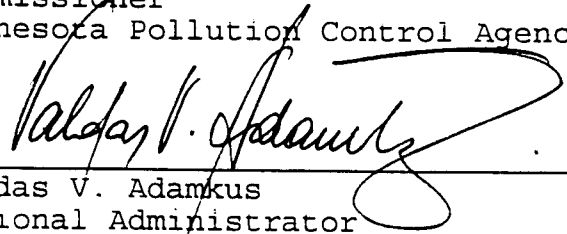
The EPA and the MPCA believe that the selected remedy is the best choice balancing of the evaluation criteria required by CERCLA.



Charles W. Williams
Commissioner
Minnesota Pollution Control Agency



Date



Valdas V. Adamkus
Regional Administrator
U.S. Environmental Protection Agency
Region V



Date

**DECISION SUMMARY
OLMSTED COUNTY SANITARY LANDFILL
OLMSTED COUNTY, MINNESOTA**

I. SITE NAME, LOCATION AND DESCRIPTION

The Olmsted County Sanitary Landfill (the Site) is located in sections 27 and 28 of Oronoco Township, Olmsted County, Minnesota. The Site encompasses 304 acres, located approximately three miles north of the corporate limits of the city of Rochester in southeastern Minnesota. The main fill area is located on the northern one third of the site and encompasses approximately 52 acres. The Site is gently rolling and vegetated with grasses and a few scattered areas of brush and trees. The waste deposit is vegetated with shallow rooted grasses. Intermittent stream valleys cross the property along the northern and eastern boundaries. The land use in the vicinity is generally small farms, rural residences and some rural subdivisions. Off the Site to the west is a quarry where gravel and limestone are mined. Beyond the quarry, there is a mobile home park.

The Site is located in what is referred to as the Driftless Area of Minnesota. This is an area which was not glaciated during the last glacial period. The area is characterized by deeply cut river valleys, disappearing streams, springs, sinkholes and caves. The area for the most part has a relatively thin layer of topsoil overlying soluble limestone and dolomite bedrock, with occasional deposits of windblown loess, stream alluvium or glacial till from earlier glacial periods. Ground water is found in substantial quantities in the limestone and in deeper sandstone layers in the area. Due to the lack of soil cover in this part of the state, the upper aquifer, the Prairie du Chien, has been degraded by farming practices, on-site waste water disposal from rural development and other anthropogenic activities. The upper aquifer does not meet drinking water standards for nitrate in many cases and in some cases is contaminated by coliform bacteria. The deeper sandstone aquifer, the Jordan, is of much better quality but contains high iron concentrations which makes it less aesthetically pleasing.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Site operated under Minnesota Pollution Control Agency (MPCA) permit SW 5 from February 1970 until March 1993, when it ceased operation and final site closure began. The permit for the Site was originally issued to the city of Rochester, but was assigned to Olmsted County in 1983 after the city transferred ownership of the site to the county. The Site accepted mixed municipal solid waste, as well as commercial and industrial solid waste until March 1987, when it closed to all but demolition debris and ash from the Rochester Public Utilities coal fired power plant.

The first cell constructed at the site was unlined and had little or no soil between the bottom of the waste and the top of the bedrock. Subsequent cells were constructed with a two foot compacted clay liner and a leachate collection system. Each cell had a tank buried adjacent to the cell to store the collected leachate, which was periodically pumped out and hauled to and treated at the municipal waste water treatment plant in Rochester. In 1991, Olmsted County removed the individual leachate tanks and installed a single tank with double walls and installed double walled piping, in the areas outside of the cell liners, leading to the new tank.

In May 1983, ground water samples from monitoring wells on the Site indicated the presence of volatile organic compounds (VOCs) in the ground water beneath the Site. Subsequent investigations led the MPCA to evaluate whether the Site should be listed on the Minnesota Permanent List of Priorities (PLP) or the National Priorities List (NPL) for superfund sites potentially requiring cleanup. The Site was added to the PLP in 1984 with a Hazard Ranking System (HRS) score of 34. The Site was added to the NPL in 1986 with a HRS score of 41. The higher NPL score was due to the discovery of documentation on the disposal of 418 cubic yards of metal hydroxide sludge at the Site during the period from 1972 through 1975.

In May of 1989, the county initiated a dye trace investigation to better determine the ground water flow direction and travel time for water in the Prairie du Chien aquifer and also to determine if there was any interconnection between the Prairie du Chien and Jordan aquifers. This study was eventually rolled into the Remedial Investigation.

In July 1989, the MPCA issued a Request for Response Action (RFRA) to the city of Rochester and Olmsted County as owners and operators of the Site. The RFRA was for a Remedial Investigation and a Feasibility Study of the Site. After the RFRA was issued, the city and county expressed their desire to negotiate a Response Order by Consent (Consent Order). The MPCA and the parties entered into negotiations and reached agreement on the Consent Order in December 1989.

The county took the lead throughout the Consent Order negotiations and agreed in the Consent Order to be the lead agency in the investigations. After the Consent Order was executed, the County and the city began the Remedial Investigation phase.

At the conclusion of the Remedial Investigation in July 1992, it was determined that additional field work was needed to examine gas migration from the Site. A Supplemental Remedial Investigation was completed in September 1993, which completed the investigation phase. Consultation with the U.S. Environmental Protection Agency (EPA) to the conclusion that a Feasibility Study would not be necessary due to the low level of risk posed by the Site.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

Activities at the Site have been closely followed by the residents in the area. The Site has been of great interest to the local community from the time it was sited. In the early years of the Site history there was a great deal of public opposition and the community has watched the development of the Site very closely. Community interest peaked during a dye trace study of ground water flow at the Site. This involved over 200 residents, whose wells were monitored for the presence of dye. There were public meetings held before the dye trace study began and update meetings were held approximately every five to six months during the first two years of the study. There was also a public meeting held at the conclusion of the Remedial Investigation to update the local residents on the status of the Remedial Investigation. The Proposed Plan for the Site recommending no further action under Superfund was published on March 5, 1994, which began the official thirty (30) day public comment period. The official notice was published in the Rochester Post Bulletin in the form of a legal notice ad. Additionally, a fact sheet discussing the proposed plan and notification of the public meeting was mailed to interested parties and the press.

On March 10, 1994, a public meeting was held to discuss the proposed plan and to accept comments on that plan. The meeting was attended by 16 local residents, four county officials and representatives of the local media. State and Federal representatives included the EPA Remedial Project Manager, four staff from the MPCA and a representative from the Minnesota Department of Health. For a summary of the comments received, please refer to the Responsiveness Summary which is attached to this Record of Decision (Attachment 1). The Public comment period ended on April 4, 1994, and no request for extension of the formal comment period was received by the MPCA or the EPA.

A public repository has been established in the Rochester Public Library, 11 First Street Southeast, Rochester, Minnesota. The public repository contains the Administrative Record for the Site. The Administrative Record contains all documents relating to the Remedial Investigation conducted for the Site and a transcript of the public meeting and comments received relative to the Proposed Plan. The Administrative Record is also located at the MPCA's main office at 520 Lafayette Road, St. Paul, Minnesota and at the U.S. EPA's Region V Office in Chicago, Illinois.

IV. SITE CHARACTERIZATION

The work at the Site involved determining the nature and extent of the contamination associated with the Site and conducting a Human Health and Ecological Risk Assessment. The Remedial Investigation concluded in part that:

- The Prairie du Chien Dolomite increases in competence with depth. This, combined with the regional ground water flow patterns, provides a degree of hydrogeologic separation between the Prairie du Chien and the Jordan aquifers.
- The widespread occurrence of dye in the monitoring wells indicates that an interconnected system of fractures and solution features is found beneath the landfill. Off site, dye was detected in ground water samples north-northeast of the landfill, indicating an interconnection from the area near the northeastern edge of the landfill to ground water sampling locations to the north-northeast of the landfill.
- Lack of dye in the Jordan supports the model of some degree of hydraulic separation between the Prairie du Chien and Jordan aquifers under the landfill.
- The fractures intersected by the monitoring well screens are sufficiently conductive and interconnected to sustain pumping rates of from 2 to 18 gallons per minute (GPM) for several hours, suggesting that the fracture and joint system in the Prairie du Chien is well developed in the vicinity of the monitoring wells.
- The shallower Prairie du Chien generally has higher nitrate nitrogen and chloride concentrations than the deeper Jordan aquifer. These chemical differences support the ground water flow model that the Jordan aquifer is hydraulically separate from the Prairie du Chien aquifer.
- Regionally, water in the Prairie du Chien flows to the northeast toward the Middle Fork of the Zumbro River, to the South Fork of the Zumbro River and to Zumbro Lake to the northeast of the landfill under a hydraulic gradient on the order of 0.004.
- The large scale migration of dye (and, potentially, waste constituents associated with the landfill) is apparently controlled by both the hydraulic gradient and the preferential movement of water along northeast-southwest-trending karst features.

- ° The direction of vertical ground water flow is generally downward, both within the Prairie du Chien and between the Prairie du Chien and Jordan aquifers. However, apparent decreasing hydraulic conductivity with depth through the Prairie du Chien contributes to hydraulic separation between the aquifers beneath the landfill.
- ° Water in the Jordan aquifer flows toward the northeast to the confluence of the Middle and South Forks of the Zumbro River. Ground water flow is strongly influenced by the South and Middle Forks of the Zumbro River and Zumbro Lake as discharge points. The upward flow from the Jordan aquifer to the Zumbro River is supported by the anion studies presented by Donohue in the Final Report for the Olmsted County Dye Trace Investigation.
- ° The cover efficiency for each of the cells (except demolition cell 1, which was still operating at the time of the RI and has since been closed) was estimated by the HELP model to be about 99 percent. The percolation rates estimated in this water balance are typical for landfills with similar final cover configurations.
- ° Residential water supply wells OLRW-151 and OLRW-108, as identified in the RI, are the most likely existing wells in the ground water flow path from the landfill and/or dye introduction point. No VOCs and no inorganic constituents greater than background levels were observed in samples from these wells.
- ° Residential well OLRW-230 is a Prairie du Chien well nearest the apparent flow path from the landfill. No VOCs or major ions indicative of leachate were found in this well.
- ° The landfill has had no measurable impact on the chemistry of water discharging from springs.
- ° The results of the sampling of the intermittent stream do not indicate an ongoing release to the surface waters immediately adjacent to the landfill.
- ° The Industrial Source Complex Short Term air dispersion model was used to estimate concentrations of airborne constituents at hypothetical receptor points and at nearby residences. The maximum modeled concentrations were at the landfill property boundary. There were no exceedences of MPCA Allowable Air Concentrations (AACs).
- ° The ground water monitoring network currently in place will adequately assess the spatial distribution of ground water quality in the immediate vicinity of the landfill. The existing monitoring well network is in the potential migration pathway and/or is part of an interconnected fracture network that extends across the landfill.

V. SUMMARY OF SITE RISKS

Part of the Remedial Investigation for the Site involved conducting a baseline risk assessment, which is intended to measure the potential current and future risks posed by chemicals of concern at the Site. The risk assessment evaluates both human health and environmental risks.

Human Health Risks

The human health risk assessment evaluates potential carcinogenic, or cancer causing risks, and non-carcinogenic risks to human health. Non-carcinogenic risks include such risks as the potential to cause liver damage and reproductive abnormalities. Furthermore, the risk assessment requires that all complete contaminant exposure pathways be evaluated. Such potential pathways include, but are not limited to: direct skin contact with or ingestion of contaminated soil, surface water, ground water; inhalation or absorption of contaminants during washing, showering, or bathing; and inhalation of airborne contaminants from the Site (see figures 1 & 2).

Air sampling and air dispersion modeling performed during the RI indicate that exposure to soil on, or air emanating from the site does not pose any significant health risks under current land use. Under a potential future land use scenario where a home would be built immediately adjacent to the original landfill boundary, an unacceptable carcinogenic risk was identified. This unacceptable risk was from inhalation of soil pore gas containing vinyl chloride migrating into the basement of this hypothetical dwelling. This potential future pathway was removed by the county with the purchase of additional property between the original landfill boundary and the intermittent stream valley to the east. The ground water pathway did not pose a significant health risk under present or future land use scenarios. The conclusions of the baseline risk assessments are as follows:

- ° If a constituent was detected at concentrations greater than background levels at locations potentially affected by landfill constituents, the constituent was included in the risk assessment. Those constituents detected at concentrations at or below background levels were eliminated from the risk assessment.
- ° The reasonable maximum exposure (RME) scenario under current land use includes a nearby resident who could be exposed to constituents of concern via ingestion of fish from Zumbro Lake; incidental ingestion, dermal absorption, and inhalation while swimming in Zumbro Lake, and inhalation of ambient air. Worker exposure to constituents of concern in ambient air was also quantified.

- Under future land use, the RME scenario includes a hypothetical future resident who owns a home directly adjacent to the landfill boundaries, and whose water supply well is screened in the Jordan aquifer. Completed exposure pathways are the same as for current land use with the addition of soil pore gas to the residence. Modeled ambient air exposure concentrations are higher because the RME scenario places the residence adjacent to the landfill.
- The Minnesota Water Well Construction Code allows the installation of new potable water supply wells in the Prairie du Chien aquifer only in areas with 50 feet or more of drift material and/or insoluble rock material over the aquifer within a 1 mile radius of the well. The closest location which meets these criteria is approximately 2 miles Southeast of the landfill. In addition, water quality in much of the Prairie du Chien aquifer does not meet county water quality standards for nitrate-nitrogen. Completion of a new well constructed in a formation which does not meet county water quality standards for nitrate nitrogen would therefore be prohibited by county code.
- The estimated excess upperbound, lifetime cancer risk under current land use RME is 7×10^{-7} , primarily the result of inhalation of vinyl chloride in ambient air as modeled from landfill gas vent emissions (see figure 3). This estimated risk is lower than the acceptable risk level of 10^{-5} (MDH, 1992).
- The hazard index estimate under current land use is 0.02, which is 50 times lower than the 1.0 U.S. EPA level of concern (see figure 4).
- The estimated excess upperbound lifetime cancer risk under future land use RME is 6×10^{-4} , primarily the result of inhalation of vinyl chloride at concentrations estimated from soil pore gas results. This risk is greater than the acceptable risk level of 10^{-5} . (This pathway has since been eliminated through a land purchase to preclude development.)
- The total hazard index estimate under future land use is 0.04, which is 25 times lower than the U.S. EPA level of concern.
- The risk and hazard estimates are likely overestimates of actual exposure due to the conservative assumptions made in the risk assessment.
- The risk and hazard estimates for future land use are highly sensitive to the assumption that institutional controls will continue to prohibit use of the Prairie du Chien for future water supply wells in this area.

- ° The sensitivity analysis of current land use exposure assumptions showed that the risk and hazard estimates are not sensitive to the assumption that residential wells are unaffected by the landfill.
- ° The risk and/or hazard associated with methane in soil pore gas could not be quantified due to lack of toxicity data in the U.S. EPA data bases. However, a potential hazard to the future hypothetical adjacent resident was eliminated by the county's purchase of additional property to preclude development in the direction of potential migration.

Ecological Risks

A qualitative ecological risk assessment was conducted for the Site utilizing existing published information. In addition, surface water concentrations of landfill chemicals of concern were computed based on information gathered in the Remedial Investigation and the dye trace study. The conclusions of the qualitative assessment are as follows:

- ° No sizable aquatic environments exist within or immediately adjacent to the Site.
- ° No state or federal surface water quality criteria were exceeded by the estimated surface water concentrations and toxicological data for constituents without criteria suggest there is little likelihood for adverse impacts.
- ° The concentration of constituents observed in monitoring wells at the landfill are unlikely to result in adverse effects to aquatic organisms in the Middle Fork of the Zumbro River.
- ° Terrestrial organisms have little opportunity to come in contact with potentially toxic waste constituents, therefore, there is little apparent risk to these organisms.

Supplemental Remedial Investigation

Subsequent to the Remedial Investigation it was determined that additional field work was needed to complete the investigation. A Supplemental Remedial Investigation was then undertaken. In part, the conclusions of the Supplemental Remedial Investigation are as follows:

- ° The intermittent stream valleys to the north and east of the site are effective physical barriers to subsurface methane migration.

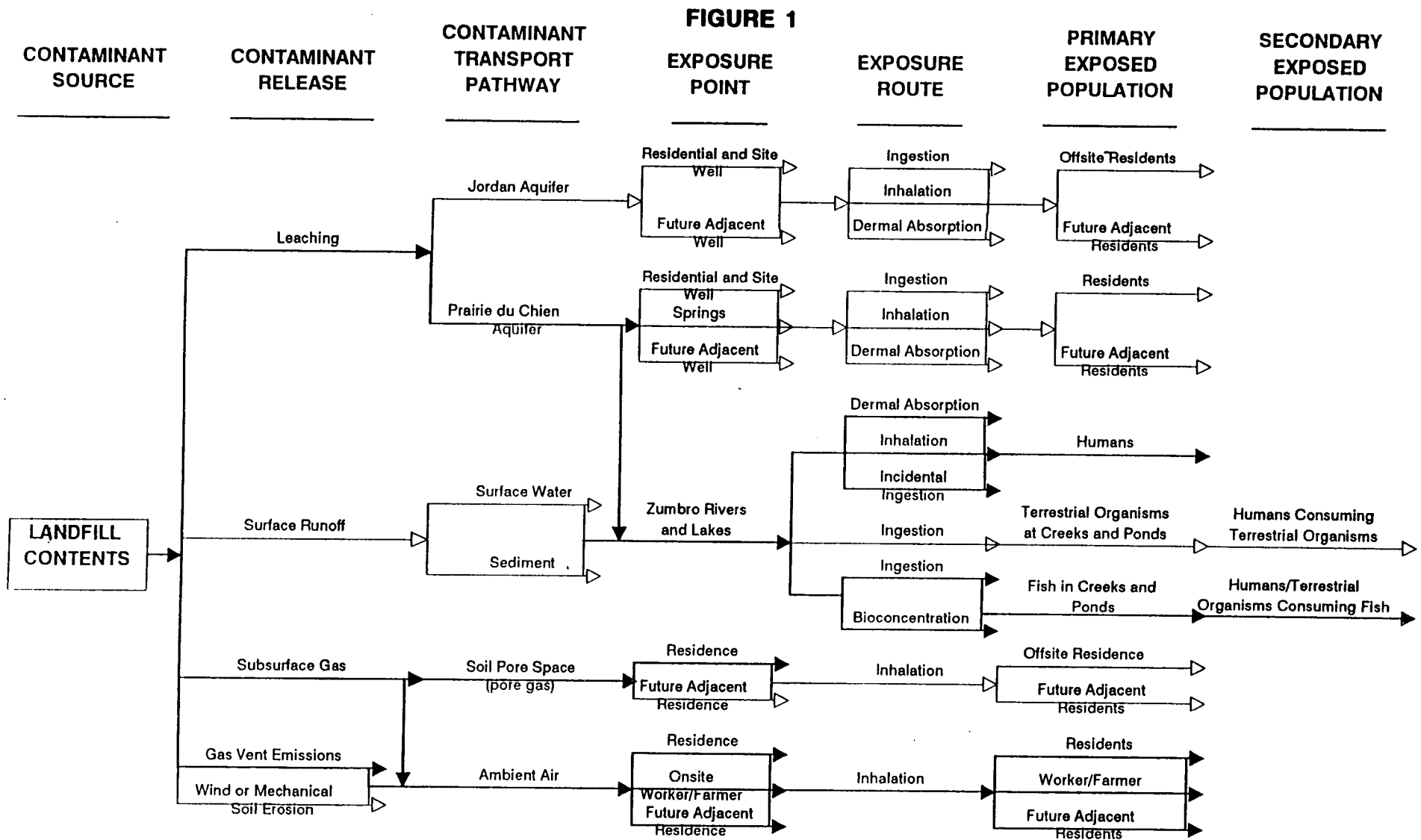
- ° Subsurface methane migration is no longer a pathway of concern because there are no receptors on the county's property and there is no evidence of methane migration beyond the property boundary.
- ° The landfill is in compliance with state limits on methane concentration at the property boundary.
- ° With the abandonment of unused residential well OLRW-219/220, this potential pathway for cross contamination between the Prairie du Chien and Jordan aquifers in the vicinity of the landfill has been eliminated.
- ° The Post Closure Care Plan sufficiently describes the activities necessary for proper management of the landfill during the 20 year post closure care period. Specifically, this plan includes detailed ground water monitoring and landfill gas compliance monitoring programs and describes the response actions that should be taken for reasonably foreseeable deviations from expected results.

Based on the findings in the Remedial Investigation and the Supplemental Remedial Investigation, the continuation of action under Superfund is not necessary. The low potential for site impacts can be adequately addressed under the Minnesota Solid Waste Rules for landfills. The continued monitoring, long-term care and contingency actions are specified in a Closure Order and the Post Closure Care Plan issued for the Site on March 22, 1994, by the MPCA. Continued monitoring to insure compliance with Minnesota Solid Waste Rules will adequately protect human health and the environment. Annual reviews of the data collected are a current requirement under the Rules and thus a formal five year review will not be necessary to ensure that the selected no action alternative remains protective.

This decision document presents the selection of the no-action remedial alternative for the Olmsted County Sanitary Landfill, Superfund Site. The selected remedial alternative was chosen in accordance with CERCLA; as amended by SARA, and to the extent practicable the NCP. Also, the selection is consistent with MERLA. This no-action alternative is the same as the preferred remedy presented at the public meeting for the Site on March 10, 1994.

This decision is based upon the reports, information and public comments, which constitute the Administrative Record for the Site.

The EPA concurs with the selected no-action remedial alternative for the Olmsted County Sanitary Landfill Superfund Site.



NOTE: Highlighting and solid arrows indicate the potential exposure pathway is more likely to be completed.

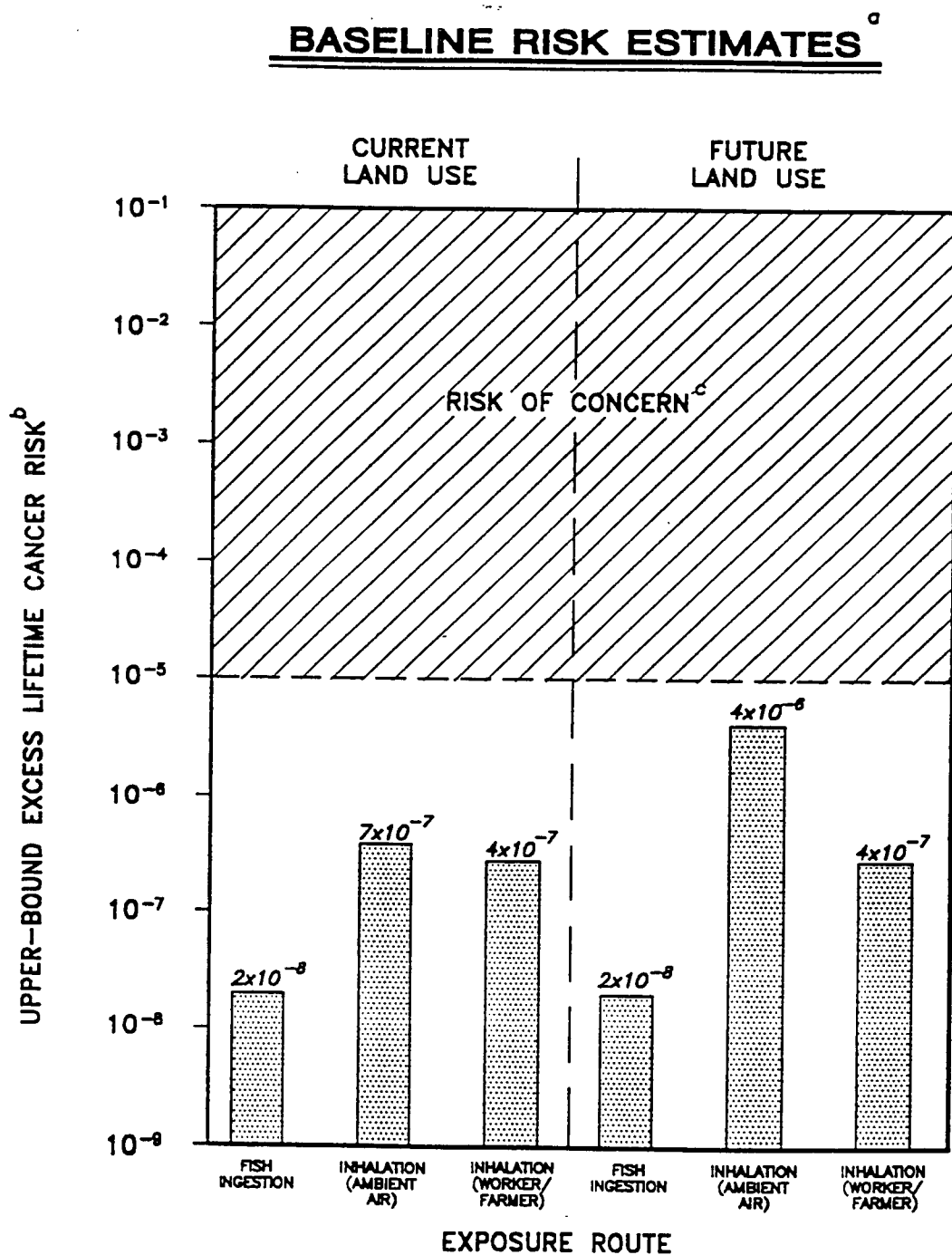
POTENTIAL EXPOSURE PATHWAYS
(CURRENT AND FUTURE LAND USE SCENARIOS)
OLMSTED COUNTY LANDFILL

FIGURE 2

POTENTIAL EXPOSURE PATHWAYS							
Migration Pathway	Exposure Point	Exposure Routes	Potential Receptors	Pathway Complete?		Pathway Quantified?	Rationale/Comment ⁽¹⁾
				Current	Future		
Groundwater	Private wells	Ingestion Inhalation Dermal Absorption	Residents	No	No	No	Currently unaffected; future private residents must install wells in the Jordan aquifer.
Groundwater Discharge	Springs	Incidental Ingestion Inhalation Dermal Absorption	Residents	No	No	No	Springs are unaffected by the landfill.
Groundwater Discharge	Zumbro Lake	Fish Ingestion Bioconcentration	Residents	Yes	Yes	Yes	Affected groundwater in Prairie du Chien aquifer discharges to lake.
Groundwater Discharge	Zumbro Lake	Incidental Ingestion Inhalation Dermal Absorption	Residents (swimming, water skiing)	Yes	Yes	No	Infrequent exposure.
Groundwater	Site water supply wells	Ingestion Dermal Absorption Inhalation	Site Workers	No	No	No	Site wells unaffected by the landfill.
Ambient Air	On-Site	Inhalation	Site Workers/Farmers	Yes	Yes	Yes	Exposure same for current and future land use.
Ambient Air	Off-Site	Inhalation	Residents	Yes	Yes	Yes	Ambient air concentrations modeled from potential vent gases.
Soil Pore Gas	Off-Site	Inhalation	Residents	No	No	No	Residents too distant for significant risk under current land use.
Subsurface Soil	On-Site	Ingestion Inhalation Dermal Absorption	Site Workers	No	No	No	No exposure point for subsurface soils.
Surface Water/Sediment	Streams/Rivers	Incidental Ingestion Dermal Absorption	Residents	No	No	No	Surface water not affected above background levels.

⁽¹⁾ See text for detailed discussion of rationale/comments.

FIGURE 3



^a Baseline estimates assume no corrective action. Residential exposure unless noted as worker/farmer.

^b The risk of developing cancer is plotted on a log scale. A risk of 10^{-5} indicates a probability of 1 chance in 100,000 of an individual developing cancer.

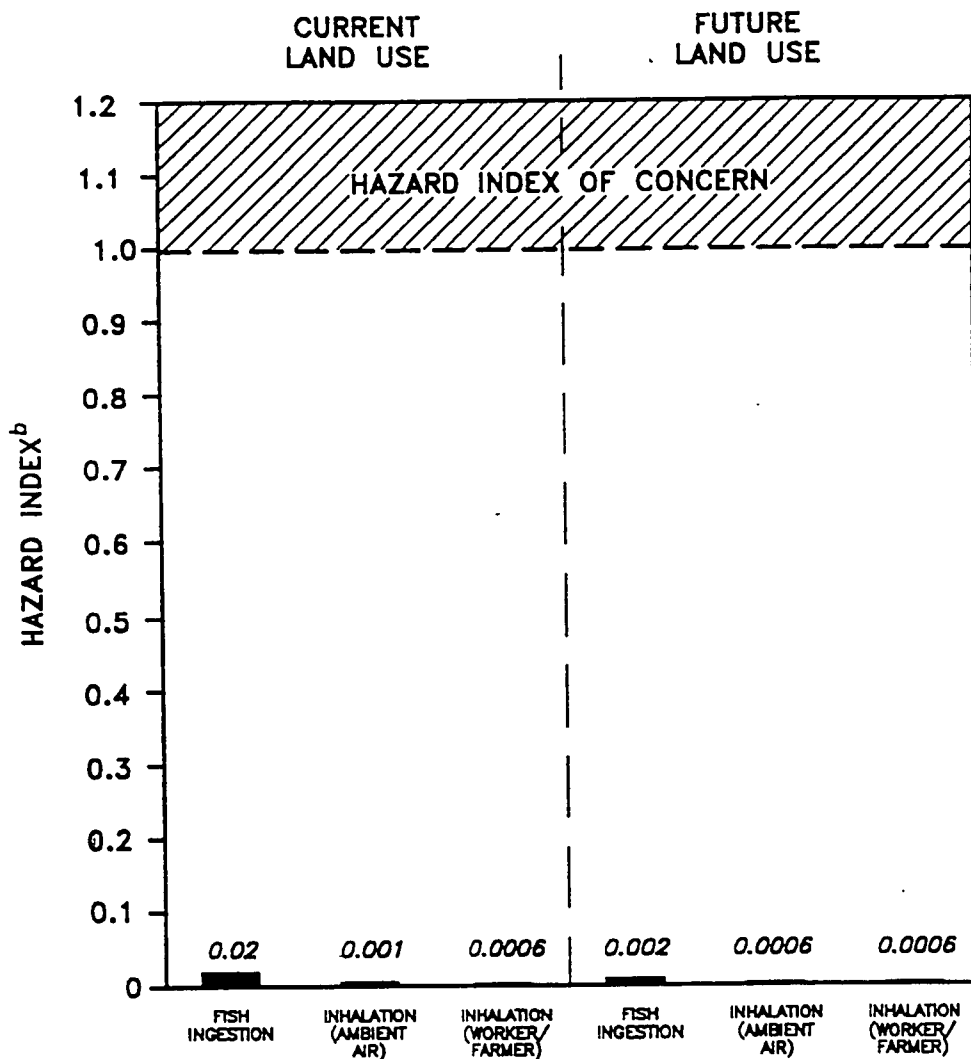
^c The MDH states acceptable risk is 10^{-6} (MDH, 1991).



DWN. BY:	DJW
DATE:	MAY 1994
PROJ. #	1836.53
FILE #	18365309

FIGURE 4

BASELINE HAZARD INDEX ESTIMATES^a



^a Baseline estimates assume no corrective action. Residential exposure unless noted as worker.

^b The hazard index (HI) is equal to the sum of the hazard quotients (i.e., exposure level/RfD) for each chemical. It is not a probability; a hazard index or quotient of ≤ 1.0 indicates that it is unlikely for even sensitive populations to experience adverse health effects.

RMT INC.

DWN. BY: DJW

DATE: MAY 1994

PROJ. # 1836.53

FILE # 18365308

ATTACHMENT 1

RESPONSIVENESS SUMMARY

Remedial Investigation and Remedial Decision for the Olmsted County Landfill

This responsiveness summary has been developed to document and respond to community concerns raised during the selection of a final remedial alternative for the Olmsted County Landfill Superfund site. Oversight of the remedial investigation of the site has been conducted by the Minnesota Pollution Control Agency (MPCA) under a cooperative agreement with the U.S. Environmental Protection Agency.

OVERVIEW

The recommended alternative for the Olmsted County Landfill was announced to the community through a legal notice and press release sent to the Rochester Post Bulletin and the Pine Island Register, and by a fact sheet mailed to a standing list of interested parties. The selected alternative is that no further remedial action be taken at this site; long-term monitoring and postclosure care will be conducted by Olmsted County under the provisions of the MPCA's Solid Waste Management Facility Compliance Monitoring Program. This is essentially the same plan as was proposed for public comment in March of 1994. A public meeting on the proposal was held in Oronoco Township on March 10, 1994.

A number of comments were received during the public meeting on the proposed alternative; the MPCA's response to those comments is contained in a later section of this responsiveness summary.

SUMMARY OF COMMENTS RECEIVED AND MPCA RESPONSES

Comments received during the public comment period on the Remedial Investigation and Proposed Plan are summarized below:

Comment:

Several commentators during the public meeting expressed distrust of the MPCA's conclusions about migration of methane gas from the landfill. Some said they feared that the cover installed on the landfill will "bottle up" landfill gas and force it to migrate downward, where it could follow natural conduits in the subsoils and then surface at unpredictable locations. After hearing of the planned venting design, some commentators still felt the venting system will be inadequate to prevent gas build-up.

MPCA response:

While shallow surface venting systems, such as the one installed at the Olmsted County site, are generally not effective at preventing subsurface migration, there are several factors at this site which minimize the potential for off-site migration. All cells, except cell #1, have a two-foot clay liner beneath the refuse, which will block the downward migration, if pressure builds up within the cell. There is a quarry to the west of the landfill which would act to vent any gas migrating to the west. To the north and to the east, there are intermittent stream valleys which cut down to the surface of the bedrock. These intermittent stream valleys are on the current landfill property and will act as gas discharge points for any gas migrating in these directions. To the south, there are clay deposits which were used as a borrow area for landfill cover. These clay deposits will act as a barrier to gas migration. Monitoring of gas probes installed at various depths around the site has shown migration beyond the cell boundaries to the northeast and east, but no migration beyond the intermittent stream valleys.

Comment:

A number of commentators at the public meeting also distrust the Remedial Investigation's conclusions about ground water flow direction near the landfill. In particular, the "disappearance" of the second dye introduction during the dye trace study causes some residents to doubt the MPCA has sufficient information to know whether nearby residential wells will be affected. Although staff explained the lack of data from the second dye introduction ultimately was irrelevant, some residents feel it actually puts most or all of the other data in doubt. More than one person said the second dye trace was disregarded because it didn't fit preconceptions about ground water flow.

MPCA response:

Hydrogeology in a karst setting is certainly not an exact science. Since the aquifer is not homogeneous, flow rates, flow direction and flow paths can change over a relatively small area. In order to better understand the hydrology of this site, extensive work was completed during the RI. The level of effort was much greater on this site than for many other larger sites simply because a higher confidence level was needed to select an appropriate remedy. The dye trace study was only one element of the RI and provided useful information that could not be obtained in other ways. Other elements of the RI included pump tests, extensive geophysical logging, hydraulic conductivity testing, video logging, direct sampling and computer modeling. Any one element by itself does not yield a clear picture, yet when combined with other elements, a better understanding of the system is possible. The lack of dye detections from the second dye introduction simply proved that there were no monitoring points along the flow path from the dye introduction point.

When the information from the dye trace study is coupled with other elements of the RI, it is reasonable to conclude that the ground water monitoring system installed at the landfill will provide adequate warning of increased contamination. The contingency action plan for the site includes "trigger concentrations" which activate additional sampling of monitoring wells and residential wells in the identified flow path.

Comment:

A resident claimed the capping of the landfill has drastically altered the local watershed, causing flooding of his property and concentrating a large volume of runoff into a smaller area, thereby increasing loading of toxics from the landfill in the affected area. He asked whether the Department of Natural Resources had been consulted about changing the watershed.

MPCA response:

Closure of the landfill has not changed the watershed, although the amount of runoff from the cells has increased from when the site was open and the cells were more permeable. The increased runoff from the cells was taken into consideration when designing the closure plan and runoff retention basins were installed on the north and east sides of the site. These retention basins collect cell runoff and allow silt to settle out in the basin. The basins are designed to accommodate the once in twenty-five (25) year storm event and should adequately slow the release of runoff to prevent flooding downstream. The flooding reported by the commentor is most likely due to dewatering activities at the nearby quarry. Ground water is pumped out of the quarry and discharged into the intermittent stream valley which crosses the landfill property on the north. The pumping at the quarry has increased in the past two years as the quarry operation goes deeper. Any further increase in pumping will require an amended water appropriations permit from the Minnesota Department of Natural Resources (MDNR). The MPCA will coordinate with MDNR to insure that increased pumping rate requests do not conflict with the monitoring system at the landfill. Sampling of the intermittent stream during the Remedial Investigation showed no impacts from the landfill on the quality of the water in this stream.

Comment:

A resident said he thought the numerous monitoring wells installed at the landfill, as well as any new wells installed in the area, would provide pathways for contaminants to move from the upper aquifers to lower, unaffected ones, thereby jeopardizing drinking water supplies.

MPCA response:

All monitoring wells installed at the site, with the exception of #17C are in the Prairie du Chien aquifer. They are constructed such that they are monitoring either shallow or deep Prairie du Chien water and are sealed with neat cement from just above the well screen to the ground surface. Well #17C is drilled through the Prairie du Chien and into the Jordan aquifer. This well is sealed from the top of the Jordan up to the ground surface with neat cement grout. This construction method prevents the well from being a conduit for contamination into the deeper aquifer. All residential wells installed in the past decade also had to meet this construction code. Future wells will also have to be installed in the Jordan aquifer and comply with both county and state well codes for construction.

Comment:

A resident expressed a concern that the landfill is "full of hazardous material" and is a disaster waiting to happen. He and one or two others at the meeting preferred that the unlined area of the landfill be excavated and lined, to prevent further release of contamination from the unlined part of the landfill.

MPCA response:

This site, like most municipal solid waste landfills, probably contains some industrial wastes that would be considered hazardous under current regulations.. The site also contains household waste, of which a small portion would be considered hazardous. The unlined cell, which was first opened in December 1972 and completed in December 1973, contains less than twelve (12) percent of the total waste and covered four acres of the total fifty-two (52) acres filled. While excavating and lining this portion of the site appears attractive at first, upon considering the above facts and the potential for causing additional releases, this idea is much less attractive. The refuse in this cell has been in place for over twenty (20) years and reached its moisture holding capacity long ago. The process of excavating this material, stockpiling and placing it back on a liner could potentially release contaminants in higher concentrations than would occur under the present stable conditions. An additional concern would be how this excavation could be conducted safely and not cause significant releases to the air.

Comment:

Several residents commented that their well water is already degraded by nitrates and in some cases coliform bacteria, and wondered whether the landfill was a contributing cause.

MPCA response:

Many wells in the Prairie du Chien aquifer throughout Olmsted County and surrounding counties are degraded by nitrates and coliform bacteria. This bedrock aquifer has very little soil overburden in this area, and is easily contaminated by farming practices and rural development. This vulnerability is the reason for the state well code and the county well code which prohibit the development of new potable water supply wells in the Prairie du Chien in areas with less than 50 feet of unconsolidated material over the bedrock within two miles of the proposed well. In addition, the landfill monitoring wells are analyzed for nitrate and have not shown any nitrate contamination associated with the landfill.

Comment:

Several residents expressed frustration with the landfill's impact on their property values. One wondered whether adjacent landowners will be prevented from developing their land while the landfill is in long-term care.

MPCA response:

This concern, while very real for the residents, is outside the jurisdiction of the proposed plan. The proposed plan includes institutional controls through the state well code and county well code. These would apply whether the landfill existed or not. The implementation of the proposed plan will not further restrict development of adjoining property, since the county now owns the property where potential gas migration could impact future development.