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Environmental Protection
Agency

Office of
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November 1990

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Superfund Record of Decision:

Washington County Landfill, MN

50272-101

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Washington County Landfill, MN
Second Remedial Action - Final

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Washington, D.C. 20460

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 40-acre Washington County Landfill site is an inactive sanitary landfill in Lake Elmo, Washington County, Minnesota. Land use in the area is predominantly residential and agricultural. Lake Jane is located 250 feet north of the landfill. The site overlies the St. Peter Sandstone and Prairie du Chien Dolomite aquifers, both of which are sources of drinking water for an estimated 3,000 residents living within 3 miles of the site. From 1969 to 1975, Washington and Ramsey counties used the site as a sanitary landfill. The landfill is located in an old gravel pit, and was constructed without a liner. An area of approximately 35 acres was filled with solid waste to an average depth of approximately 30 feet. About 2.57 million cubic yards of solid waste, excluding cover material, were disposed of in the landfill. The waste was primarily composed of residential waste with smaller amounts of demolition and commercial waste. Monitoring by Washington County in 1981 revealed low level VOC contamination, which poses a health risk based on long-term ingestion of ground water. In 1983, four nearby private wells also were found to contain low levels of VOCs, and drinking water well advisories were issued. A 1984 Record of Decision (ROD) provided for the installation and operation of a ground water gradient

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Washington County Landfill, MN
Second Remedial Action - Final
Contaminated Medium: gw
Key Contaminants: VOCs (benzene, PCE, TCE, xylenes)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

19. Security Class (This Report): None
21. No. of Pages: 89
20. Security Class (This Page): None
22. Price

Abstract (Continued)

control and spray-irrigation treatment system at the landfill. It also provided a safe drinking water supply to residents with drinking water well advisories and initiated monitoring of the ground water gradient control system. This ROD addresses a final remedy for drinking water supply as part of a second operable unit. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, TCE, and xylenes.

The selected remedial action for this site includes providing a municipal drinking water supply system to supply drinking water to 10 homes with private wells that have been affected by the contaminant plume; and continuing operation of the gradient control well and spray-irrigation treatment system for the first operable unit, which consists of four gradient control wells, two onsite spray-irrigation treatment areas, and onsite discharge to surface water. The estimated present worth cost of this remedial action is $400,000, which includes an annual O&M cost of $2,469.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ground water clean-up goals are based on Recommended Allowable Limits (RALs) established by the State and include benzene 7 ug/l, PCE 6.6 ug/l, TCE 31 ug/l, and xylenes 400 ug/l.

RECORD OF DECISION

LONG-TERM WATER SUPPLY

WASHINGTON COUNTY LANDFILL

1990

MINNESOTA POLLUTION CONTROL AGENCY

Declaration for the Record of Decision

SITE NAME AND LOCATION

Washington County Landfill
Lake Elmo, Minnesota

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Washington County Landfill Site (Site), in Lake Elmo, Minnesota which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for this Site.

The United States Environmental Protection Agency concurs with the selected remedy. The information supporting this remedial action decision is contained in the administrative record for this Site.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This operable unit is the second unit of two operable units for the Site. The selected remedy for this Site is a municipal drinking water supply system to supply potable drinking water to resident of 10 homes in Lake Elmo which have received Minnesota Department of Health (MDH) drinking water well advisories to not use their existing well water for drinking or cooking. The selected remedy for the first operable unit, a gradient control well and spray-irrigation system, was installed and has been operational since December 1983. The municipal drinking water supply system will provide safe drinking water to those residents whose well water has been determined to be unsafe for drinking by the MDH. The selected remedy addresses the principal threat of ingestion of contaminated water posed by releases of contaminants from the Site. Operation of the gradient control well and spray-irrigation treatment system will continue to prevent further releases into the aquifers downgradient of the landfill and to treat the contaminated water captured by the pump out system.

The major components of the selected remedy are as follows:

- Continued operation of the gradient control well and spray-irrigation treatment system which consists of four gradient control wells, two on-site spray-irrigation treatment areas, and an off-site discharge of

ground water from one pump out well which operates under National Pollutant Discharge Elimination System Permit MN 0054348, dated May 4, 1989.

- Connection of 10 homes with MDH drinking water well advisories to the city of Oakdale municipal water supply system.

Declaration of Statutory Determinations

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. The remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, and it satisfies the statutory preference for remedies that employ treatment that reduce toxicity, mobility, or volume as their principal element.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Valdas V. Adamkus
Regional Administrator
Region V
U.S. Environmental Protection Agency
(RA signed concurrance on letter to Gerald L. Willet - attached)

Date 11-15-90 → letter attached

for Barbara Lindsay Sims
Gerald L. Willet
Commissioner
Minnesota Pollution Control Agency

Date 9-27-90

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

NOV 15 1990

REPLY TO ATTENTION OF:

Mr. Gerald L. Willet
Commissioner
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155

Dear Mr. Willet:

The United States Environmental Protection Agency (U.S. EPA) hereby concurs with the remedy selected pursuant to Minnesota law by the Minnesota Pollution Control Agency (MPCA) for the Washington County Landfill Site, Operable Unit 2. MPCA signed and forwarded a Record of Decision (ROD) to U.S. EPA for concurrence on September 27, 1990. Our concurrence is in accordance with 40 CFR 300.515(e)(2)(i) and (ii) and is based on our review of the documents listed on the enclosure to this letter.

U.S. EPA's concurrence stems from two conclusions: 1) the response action selected for this operable unit will reduce risks to human health and the environment; and 2) the response action will not be inconsistent with nor preclude implementation of the expected final remedy.

The ROD calls for providing potable drinking water to ten residences which have received Minnesota Department of Health (MDH) drinking water well advisories. We note that these advisories are not based on violations of promulgated drinking water standards but rather upon MDH's unpromulgated "Multiple Contaminant Criterion." We therefore agree with MPCA's assessment on page 29 of the ROD that this criterion is a "To Be Considered" factor rather than an "Applicable or Relevant and Appropriate Requirement."

In concurring with the ROD for Operable Unit 2, U.S. EPA understands that implementation of the ROD will not affect the remainder of the remedial action being conducted at the site under Operable Unit 1. We expect to participate in a reevaluation of Operable Unit 1 in 1991.

We look forward to our continuing involvement in the Washington County Landfill Site.

Sincerely yours,

/s/ RALPH R. BAUER

Valdas V. Adamkus
Regional Administrator

Enclosure

DOCUMENTS REVIEWED FOR RECORD OF DECISION CONCURRENCE
WASHINGTON COUNTY LANDFILL
LAKE ELMO, MINNESOTA
OPERABLE UNIT 2

1989 Evaluation Report, Washington County Sanitary Landfill No. 1. Wenck Associates, Inc. October 1989.

Letter from Rodney E. Massey, MPCA, to Mary Luth of the Washington County Public Health Dept. and Richard Ragan of the Ramsey County Division of Environmental Health. March 27, 1990.

Letter from Rodney E. Massey, MPCA, to Mary Luth of the Washington County Public Health Dept. and Richard Ragan of the Ramsey County Division of Environmental Health. May 24, 1990.

Long-term Drinking Water Supply Plan, Washington County Sanitary Landfill No. 1. Prepared for Washington and Ramsey Counties. Wenck Associates, Inc. June 1990.

National Pollutant Discharge Elimination System, Quarterly Report, April - June 1990. Washington County Sanitary Landfill No. 1. Wenck Associates, Inc. July 1990.

DECISION SUMMARY

Decision Summary for the Record of Decision

1. Site Name, Location, and Description

The Washington County Landfill Site (Site) is located within the city limits of Lake Elmo in Washington County (T 29 N, R 21 W, NE 1/4 NE 1/4 of Section 16), approximately nine miles northeast of downtown St. Paul (Figure 1, 1A, and 1B).

The area adjacent to the landfill is predominantly residential, with some areas used for farming. There is a city park to the east of the landfill. The Site does not lie within a flood plain and there are no wetlands or surface waters on the Site. Lake Jane is located 250 feet north of the northern edge of the landfill property boundary. There are approximately 3,000 people living within a three mile radius of the Site.

The landfill is located in a gently sloping area characterized as glacio-fluvial in origin. The Site is underlain by sand and gravel deposits. These deposits constitute an unconfined aquifer in the study area. The St. Peter Sandstone and Prairie du Chien Dolomite aquifers underlie the glacio-fluvial aquifer at the Site. Ground water flow in the upper sand and gravel aquifer is generally to the south away from Lake Jane.

Multiple low level volatile organic (VOC) contamination exists in all three aquifers , the glacio-fluvial, the St. Peter Sandstone, and the Prairie du Chien Dolomite.

2. Site History and Enforcement Activities

In 1968, Washington County purchased a 110 acre site in the Lake Elmo and designated 40 acres of the Site as a sanitary landfill disposal area. An area of approximately 35 acres was filled with solid waste to an average depth of approximately 30 feet. It estimated that 2.57 million cubic yards of solid waste excluding cover material has been disposed of in the landfill. The solid waste is estimated to be comprised of 73 percent residential wastes, 26 percent commercial wastes and 1 percent demolition wastes.

Washington County was issued a waste disposal system permit by the Minnesota Pollution Control Agency (MPCA) on May 12, 1969, for the Washington County East Oakdale Sanitary Landfill, Permit Number SW-1. The location of the landfill was an old gravel pit and was constructed without a liner. The landfill began operation in September 1969 and closed in May 1975. The landfill was operated by both Washington and Ramsey Counties under a joint powers agreement.

Following landfill closure, a ground water monitoring program was instituted at the landfill to detect possible leachate generation that is often associated with the disposal of solid waste. In 1981, the MPCA requested that Washington County begin monitoring ground water at the landfill for organic compounds. This monitoring showed elevated levels of some organic compounds. Additional ground water monitoring wells were subsequently installed. Ground

water below and downgradient from the landfill was found to be contaminated with a variety of volatile organic compounds (VOCs), including 1,1-dichloroethylene, trichloroethylene, tetrachloroethylene, methylene chloride, 1,2-dichloroethane, 1,1,2-trichloroethane, benzene, trans-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,2-dichloropropane, chlorobenzene, ethyl benzene, toluene, bis-2-ethyl hexyl phthalate, diethyl phthalate, di-n-butyl phthalate, 1,1-dichloroethane,. and isophorone.

In 1983, four nearby private drinking water wells, southwest and downgradient of the landfill, were found to have levels of one or two VOCs above or near drinking water well guidelines requiring private drinking water well advisories from the Minnesota Department of Health (MDH). Details concerning the nature and concentration of these contaminants can be found in MPCA's Minnesota Enforcement Decision Document (MEDD), dated July 7, 1886, Remedial Investigation Section (Attachment 1).

Although several other residential wells were known to have low level contamination from multiple VOCs, the MDH did not issue drinking water well advisories to these residents. In June 1986, the MDH notified two of the residents with advisories that contamination had dropped to lower levels considered acceptable for drinking water. Advisories to these residents were lifted.

In October 1984, the MPCA and the Counties signed a Response Order by Consent pursuant to the authority vested in the MPCA by the Minnesota Environmental Response and Liability Act (MERLA) of 1983, Minn. Stat. ch. 115B, and Minn. Stat. chs. 115 and 116 for the purposes of: (1) installing and operating a ground water gradient control and spray-irrigation treatment system at the landfill; (2) providing a safe drinking water supply to residents with drinking water well advisories; (3) monitoring the ground water gradient control system; and (4) reimbursing MPCA expenses. As detailed in the MEDD referenced above, those residents with drinking water advisories were provided with granular activated carbon (GAC) filters for their wells.

In May 1989, the MPCA issued a National Pollutant Discharge Elimination System (NPDES) permit to Washington County for an off-site discharge from one of the gradient control wells, GC1, into Eagle Point Lake. During the NPDES permit application process in 1988, the Counties sampled GC1 for a more extensive list of possible contaminants than was being used to monitor the ground water at this time. Based on the contaminants detected in 1988 and 1989 in the ground water, the MPCA requested that the MDH reassess the health risk to the residents from drinking the contaminated ground water. After additional residential well sampling in early 1989 and based upon a different health risk criterion - the presence of four or more contaminants at any measurable level - 10 new drinking water well advisories were issued. Contaminants in these wells were all below their respective Recommended Allowable Limits (RALs) established by the MDH. During this period, it at first appeared that elevated levels of lead were also present in residential drinking water, but elevated levels were subsequently determined to be caused from contaminated bottles used by the Counties' laboratory.

In March 1990, based upon the updated sampling results from the sampling done in 1989 and the early part of 1990 and the new drinking water well advisories, the MPCA staff, as a part of the MPCA approval of the 1989 Annual

Ground Water Monitoring Evaluation Report, requested that the Counties re-evaluate the long-term drinking water supply plans of October 1985 and May 1986. The Counties responded to this request in a document entitled, "Long-Term Drinking Water Supply Plan, Washington County Sanitary Landfill No. 1," dated June 30, 1990. This report constitutes the Remedial Investigation/Feasibility Study (RI/FS) Report for the purposes of this Record of Decision (ROD).

There is no history of enforcement actions taken to date at the Site under any of the following authorities: CERCLA, RCRA, the Clean Air Act, the Clean Water Act, or any other federal environmental statutes.

3. Highlights of Community Participation

The RI/FS Report as defined above and the Proposed Plan for the Washington County Landfill was released to the public for comment on July 27, 1990. These two documents were made available to the public in both the administrative record and an information repository maintained at the Washington County Library, Lake Elmo Branch, 3459 Lake Elmo Avenue North in Lake Elmo. The notice of availability for these two documents was published in the St. Croix Valley Press on August 1, 1990, and the Stillwater Gazette on July 30, 1990. A public comment period on the documents was held from July 31, 1990, to August 31, 1990. In addition, a public meeting was held on August 14, 1990. At this meeting, representatives from the MPCA answered questions about problems at the Site and the remedial alternatives under consideration. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this ROD.

4. Scope and Role of Operable Unit or Response Action Within Site Strategy

As with many state Superfund sites, the problems at the Washington County Landfill Site are complex. As a result, the MPCA staff has organized the remedial work into two operable units at the Site. This ROD addresses the drinking water supply remedy previously addressed by the MEDD and the planned revised remedy at the Site. The municipal drinking water system alternative is currently being designed by Lake Elmo. The remedial action, the municipal system, addresses the principal threat posed by the conditions at the Site, i.e., the contamination of ground water downgradient of the Site.

5. Summary of Site Characteristics

The ground water primarily in the alluvial aquifer is contaminated with low levels of VOCs. Figure 1 is a map of the residential area studied with the service area boundary for the proposed municipal drinking water system demarked by the broken line. Table 1 indicates those residences with drinking water well advisories, those with confirmed contaminant detections, and those with non-detections. Table 2 lists the sampling results from ground water for individual residences. Table 3 lists the lead data for individual residences. Tables 1, 2, and 3, from the RI/FS Report, summarize data collected in late 1989 and early 1990.

Table A below summarizes Table 2 data showing each contaminant's highest concentration, RAL, and whether or not the contaminant is carcinogenic. All of

these contaminants, with the exception of benzene and xylenes, as noted in the footnote to Table A, are believed to be releases from the landfill and have been found in ground water monitored from either on-site pump out or monitoring wells.

Table A

Contaminant	Highest Concentration (parts per billion)	Recommended Allowable Limit (ppb)	Carcinogenic (C) or Non-carcinogenic (NC)
Chloromethane	0.27	None	Undetermined
Methylene chloride	1.20	48.0	C
Chloroform	0.70	57.0	C
Dichlorofluoromethane	4.20	None	Undetermined
Dichlorodifluoromethane	46.00	1400.0	NC
Trichlorofluoromethane	3.60	2100.0	Undetermined
1,1-Dichloroethylene	0.71	7.0	NC
Cis-1,2-dichloroethylene	1.30	70.0	NC
Trichloroethylene	11.00	31.0	C
Tetrachloroethylene	2.20	6.6	C
1,1-Dichloroethane	2.70	810.0	NC
1,1,1-Trichloroethane	3.30	200.0	NC
Acetone	22.00	700.0	NC
Tetrahydrofuran	1.40	154.0	NC
Benzene	0.21 *	7.0	C
Xylenes	0.62 *	400.0	NC

* Subsequent sampling could not confirm these initial sampling results so these results could be erroneous.

Table B compares the levels of contaminants present in the mid-1980s (see Attachment 1) with the latest data for the four residents that originally had drinking water well advisories (concentrations in parts per billion.) This data indicates that the level of these contaminants have declined in the past four to five years; however, the contaminants have persisted at low levels.

Table B

Resident	Contaminant	Concentration Range Mid-1980s	Concentration Range Late 1989/Early 1990
J. Downs	Trichloroethylene	4-123	0.020-8.9
	Tetrachloroethylene	1-10	0.008-2.2
F. Downs	Tetrachloroethylene	0.2-40	0.008-0.13
L. Richert	Tetrachloroethylene	0.4-10	0.008-0.32
G. Hueslman	Trichloroethylene	1.3-16	0.020-9.6

Residential wells were also recently tested for lead because lead was found in ground water under the landfill in the early 1980s. Table 3 summarizes the lead data. Lead in levels above the RAL of 20 ppb were never confirmed in residential wells in the study area. High levels initially found were later determined to be from contaminated sample bottles used by the Counties' laboratory. The lead data do not indicate a lead release from the landfill. Low levels of lead found in residential drinking water are believed to be due to naturally occurring lead and/or lead from house plumbing.

Low levels of phenolic compounds were found in the ground water in the study area, but these compounds do not appear to be a release from the landfill and could be naturally occurring and/or from septic tank contamination and/or from some other source.

Figures 2,3,4,5, and 6 from the RI/FS Report illustrate the distribution of contaminants in the ground water downgradient of the landfill. Figures 2, 3, and 4 show the distribution of three contaminants found in highest concentrations. Figure 5 shows the number of contaminant detections and their distribution. Figure 6 is a "Additivity Contour Map." Addivity is defined by the MDH as the sum of the concentration of each contaminant for each well divided by each contaminant's respective RAL for all contaminants found in each respective well. Except for dichlorofluoromethane (Figure 4), these maps show that the low-level contaminant plume is at it highest concentration in the residential area west of Jamaca Avenue along 36th and 37th Streets North.

Figures 7 and 8 from the RI/FS Report show water level contour maps from the study area. These figures show capture zone boundaries for the ongoing on-site remedy which has been effective in preventing the further release of contaminants from the landfill. The pump out system has not, however, been effective in capturing contaminants in the residential area near 36th and 37th Streets North as this area is beyond the capture zone of the pump out system. Reduction in levels of contaminants over the past four or five years in this residual plume is likely due to natural attenuation combined with some possible pump out and treatment from operation of individual residential well systems.

Although the horizontal distribution of contaminants in the low level VOC plume is well studied, the vertical distribution of the contaminants is not as well known. Efforts to better characterize the vertical distribution of contaminants are presently being undertaken by the Counties. The work involves downhole geographical logging of residential and monitoring wells, seismic reflection profiles and installation of additional monitoring wells. This work will aid in determining in the subsurface stratigraphy in the area, aid in determining in which aquifers the residential wells are screened, and aid in determining what levels of contaminants are present in the three aquifers beneath the Site.

Generally, multiple low level VOC contamination exists in all three aquifers, the glacio-fluvial aquifer, the St. Peter Sandstone aquifer and the Prairie du Chien Dolomite aquifer. The chemicals found in the residential wells that can now be attributed to one of the three aquifers and the highest concentration of these chemicals are shown in Table C.

TABLE C

MAXIMUM LEVELS (RESIDENTIAL WELLS)[1]

Compound	Glacio-Fluvial Aquifer	St. Peter Aquifer	Prairie du Chien Aquifer
Methylene chloride	1.2	1.0	0.41
Chloroform	0.7	NQ[2]	NQ
Dichlorofluoromethane	4.1	42	NQ
Dichlorodifluoromethane	46	10	4.6
Trichlorofluoromethane	3.6	0.7	NQ
1,1-Dichloroethylene	0.71	0.41	NQ
Cis-1,2-dichloroethylene	1.2	1.3	0.6
Trichloroethylene	14	11	3.2
Tetrachloroethylene	2.2	1.6	0.13
1,1-Dichloroethane	2.7	2.6	0.8
1,1,1-Trichloroethane	3.3	2.2	1.5
Acetone	7.2	22	2.7
Tetrahydrofuran	1.4	NQ	NQ
Benzene	0.21	NQ	0.26
Toluene	0.32	NQ	NQ
Xylenes	0.62	NQ	0.62
Total Phenols	15	NQ	3.5
Bis-2-ethyl hexyl phthalate	NQ	NQ	4
Di-n-butyl phthalate	NQ	NQ	2

1. Total of 96 residential wells (for 55 wells, aquifer unknown.)
2. Not quantified.

6. Summary of Site Risks

Table A lists the contaminants of concern for the ground water in the residential area downgradient of the landfill. The ground water is the only medium of concern for this operable unit. The exposure pathway of concern is ingestion of contaminated ground water. The potentially exposed populations are adults and children whose homes have drinking water well advisories from the MDH. The MDH drinking water well advisories issued to the affected residents have stated that even though the contaminant levels found in a resident's drinking water well do not exceed the Recommended Allowable Limits established by the MDH, "...the number of contaminants found causes us to be concerned about the long term ingestion of this water. This department [MDH], therefore, recommends you seek an alternate source of water for drinking and food preparation. At this time, we see no reason for you to discontinue the use of this well for other purposes such as bathing, dishwashing, etc."

The MDH has identified the criterion used to issue drinking water well advisories at the Washington County Landfill Site as the Multiple Contaminant Criterion. The advisories were issued to residents who had four or more of the contaminants listed in Table A. The rationale for use of this criterion involve three considerations: (1) if there are four or more contaminants at any measurable level, there may be other unknown contaminants of known or unknown toxicity to which the residents could be exposed; (2) known contaminants could mask other contaminants to which the residents could be exposed; and (3) there may be fluctuations in the levels of contaminants such that it is safer to issue an advisory rather than to risk exposing affected residents to fluctuating contamination.

As of the writing of this ROD, the Multiple Contaminant Criterion and other criteria used by the MDH for issuing drinking water well advisories to private drinking water wells have been applied to several sites in Minnesota and are being formally adopted by the MDH, but have not been promulgated.

7. Description of Alternatives

The following alternatives have been identified for supplying a source of safe drinking water in the vicinity of the landfill:

- No Action
- Granular Activated Carbon Filters
- New Residential Wells
- Residential Cluster Wells
- Public Water Supply

An integral part of any of these alternatives is the continued operation of the gradient control well and spray-irrigation treatment system. Currently, this system consists of four gradient control wells (GC1, GC2, GC3, and GC4), two on-site spray irrigation treatment areas and off-site discharge of a portion of the ground water to manhole 36 of the Valley Branch Watershed District's

Tri-Lakes Outlet. Gradient control well, GC1 (Figure 1), was originally installed to capture contaminated ground water between the landfill and residential wells south and southwest of the landfill. Migration of contaminants from the landfill was stopped and some contaminated ground water was drawn back from downgradient residential wells near GC1. The gradient control well and spray-irrigation treatment system will continue to operate as part of any drinking water supply alternative.

This ROD only evaluates the alternatives in terms of supplying a permanent, potable drinking water supply to the 10 homes with MDH drinking water well advisories, even though the RI/FS Report also evaluated the alternatives for homes that do not have MDH drinking water well advisories. The ROD's scope, therefore, reflects portions of attached Tables 4 through 12 from the RI/FS Report referenced as "MPCA Sites" and "MPCA Cost."

Applicable or Relevant and Appropriate Requirements

The applicable or relevant and appropriate requirements for this Site are:

1) The alternatives must meet MDH Recommended Allowable Limits (RALs) and Safe Drinking Water Act Amendments. Each alternative must also eliminate the exposure of residents to four or more chemicals since this criterion is being used by the MDH to issue drinking water advisories.

2) The alternatives must comply with design criteria and guidance for well construction and water supply systems (i.e., MDH Plumbing Code (Minn. Rules ch. 4715), MDH Public Water Supply Codes (Minn. Rules ch. 4720) and MDH Well Construction Codes (Minn. Rules ch. 4725).)

Each alternative must meet all ARARs to be eligible for selection.

A. No Action

This alternative consists only of long-term residential ground water monitoring. The no action alternative does not meet the objective of providing a permanent supply of safe drinking water to affected residents. Evaluation of this alternative will provide a basis of comparison for the remaining alternatives and may provide cause for additional ground water removal and treatment. This alternative requires long-term sampling and assessment of off-site ground water quality. (Long-term sampling and assessment of on-site ground water quality and eventual sealing of monitoring wells would be conducted under any alternative. Therefore, it will not be considered part of this evaluation.)

Long-term sampling and assessment of off-site ground water quality would be required to assure that public health, welfare and environment are protected in the long term for either of the above options. The monitoring program would consist of quarterly sampling and assessment of the ten residential wells which currently have drinking water advisories and the 21 residential wells which currently have confirmed detections of VOCs or BPQLs. Semiannual sampling of another 50 residential wells within the service area would be conducted. The total number of residential wells sampled would be

approximately 81. Depending on the results of this sampling, the monitoring plan may be modified. However, for this evaluation it is assumed that this number of wells would be sampled at this frequency for a period of 20 years.

Estimates of the annual cost of the no action alternative options are shown in Table 4.

B. Granular Activated Carbon Filters

Under this alternative the present GAC filters would be maintained as long as necessary in the affected residents' water supplies and additional units would be installed if testing indicated unacceptable contaminant presence in previously unaffected homes. Quarterly monitoring of treated water would be conducted, analyzing the samples for VOCs and total coliform bacteria.

In addition to the three existing GAC filters, GAC filters would be installed at an additional 7 residential homes, i.e., those homes which have MDH drinking water well advisories. For the purpose of cost comparison, it is assumed that 10 homes would receive GAC filters for a period of 20 years.

Long-term sampling and assessment of off-site ground water quality would be required to assure that public health, welfare and environment are protected in the long term. The monitoring program would consist of quarterly sampling and assessment of the ten residential homes which currently have drinking advisories. In addition, semiannual sampling would be conducted at an additional 21 residential homes which have some level of contamination but don't have MDH drinking water well advisories. Semiannual sampling of the remaining 50 residential wells within the service area would also be conducted. The total number of residential wells sampled would be approximately 81.

The estimated capital cost of this alternative is shown in Table 5 and the estimated annual costs are shown on Table 6. Costs for providing GAC filter units to both 31 homes and 10 homes are included.

C. New Residential Wells

This alternative consists of drilling new wells for individual houses. These wells would extend considerably deeper to the uncontaminated Ironton-Galesville aquifer. New wells would be drilled for the same 10 residential homes which have MDH drinking water well advisories. These new wells would be constructed with a double casing. The inner 4-inch casing would be set 15 feet into the Ironton-Galesville aquifer. The outer 8-inch casing would be set into the upper most bedrock, sealing off the upper contaminated formation. Well construction specifications will meet requirements of the Minnesota Department of Health Water Well Construction Codes.

This alternative assumes no government administration or responsibility for operation and maintenance of the new wells.

Long-term sampling and assessment of off-site ground water quality would be required to assure that public health, welfare and environment are protected in the long term. Prior to placing each new well into service, water samples would be analyzed to assure that the aquifer is uncontaminated. The monitoring program would consist of annual sampling of the 10 new residential

wells (plus 21 wells with detectable concentrations of VOCs and BPQLs). In addition, semiannual sampling of another 50 residential wells within the service area would be conducted. The total number of residential wells sampled would be approximately 81. Depending of the results of this sampling the monitoring plan may be modified. However, for this evaluation it is assumed that this number of wells would be sampled at this frequency for a period if 20 years.

The capital cost of this alternative is shown in Table 7. Table 8 shows the estimated annual cost of this alternative.

D. Residential Cluster Wells

The fourth alternative is the installation of two residential cluster well systems where more than one home could be serviced from one well. The wells would be completed in the Ironton-Galesville aquifer which, as mentioned above, is at considerably greater depth than the present residential wells. Distribution lines would be installed to connect each home to cluster wells. An electrical service would be installed to provide power to the pumps. Each cluster of homes must agree to well and electrical service location as well as administrative and maintenance costs. This alternative assumes that there would be no government involvement and that homeowners agreements or homeowners associations would have to be formed. These new wells would be constructed with a double casing. An inner 6-inch casing would extend 15 feet into the Ironton-Galesville formation. The outer 10-inch casing would be set into the uppermost bedrock sealing off the upper contaminated formation.

A seperate private well would be installed at the Nippoldt residence. Due to its long distance from any of the cluster well systems, it is not practical to include this home in any of the cluster systems. Construction of this well would be as described for new residential wells.

Long-term sampling and assessment of off-site ground water quality would be required to assure that public health, welfare and environment are protected in the long term. Prior to placing each new well in service, water samples would be analyzed to assure that the aquifer is uncontaminated. The monitoring program would consist of annual sampling of the 2 residential cluster wells and additional new private well. In addition, an semiannual sampling of another 50 residential wells within the service area would be conducted. The total number of wells sampled would be approximately 58. Depending on the results of this sampling the monitoring plan may be modified. However, for this evaluation it is assumed that this number of wells would be sampled at this frequency for a period of 20 years.

The capital cost of this system is enclosed in Table 9. Table 10 shows the estimated annual cost of this alternative.

E. Public Water Supply

A fifth alternative is to install a public water supply system to service the 10 homes with MDH drinking water well advisories.

This alternative would connect the 10 homes to the existing Oakdale municipal water supply system. An additional water main would be installed to bring water to the service area. This would eliminate the need for a new well,

well house, controls, chlorination/fluoridation and storage facilities of a stand-alone Lake Elmo system. The operation and maintenance of this system would be the responsibility of Lake Elmo.

The capital cost of this system is shown in Table 11.

8. Summary of Comparative Analysis of Alternatives

The following is a comparative analysis the alternatives. The criteria are grouped into three categories: threshold criteria; primary balancing criteria; and modifying criteria. The threshold criteria includes the first two criteria which are overall protection of human health and the environment and compliance with ARARs.

A. Threshold Criteria

1. No Action

The no action alternative implies monitoring residential ground water quality only.

a) Overall Protection of Human Health and Environment The no action alternative does not meet the criteria of protecting human health since none of the homes with drinking water advisories would receive safe drinking water.

Continued operation of the gradient control well and spray-irrigation treatment system will protect the environment near the landfill.

b) Compliance with ARARs Water quality ARARs for the residential area near the landfill are RALs set by the MDH as well as the criteria that a residential well will be issued a drinking water advisory if it has four or more volatile organic compounds in its drinking water. None of the resident's homes have water exceeding RALs, however, ten residential homes currently have drinking water advisories based on four or more chemicals and have been advised not to use their water for drinking purposes. Since the no action alternative does not alleviate this condition it does not comply with ARARs.

2. Granular Activated Carbon Filters

This alternative consists of utilizing the current three GAC filters. In addition, 7 GAC filters would be installed in residential homes with MDH drinking water well advisories. Monitoring for volatile organic compounds and total coliform bacteria would be performed at each of these installations.

a) Overall Protection of Human Health and Environment This alternative would protect the human health of the residents near the landfill by removing VOCs from their drinking water. Periodic sampling and analysis of residential ground water would insure a

source of safe drinking water to these residents by monitoring for VOC breakthrough of the GAC filters and appearance of VOCs in previously uncontaminated wells.

It may be possible for additional residential wells to become contaminated in the future. Although unlikely, well construction on undeveloped land at mandated deeper depths may show additional wells with contaminants. Therefore, additional GAC filters may be necessary in the future.

Continued operation of the gradient control well and spray-irrigation treatment system will protect the environment near the landfill.

b) Compliance with ARARs This alternative does meet the MDH RAL and the Multiple Contaminant criteria by removing these chemicals from the source of drinking water. In addition, installation of filters would meet all MDH plumbing codes.

3. New Residential Wells

The third alternative consists of installing a new residential well for each of the 10 homes with MDH drinking water well advisories.

a) Overall Protection of Human Health and Environment Installation of new individual residential wells will supply these residents with a long-term source of uncontaminated potable water. This will be accomplished by drilling wells to the Ironton-Galesville aquifer which is currently believed to be unaffected by the contaminants and which is unlikely to become contaminated. Sampling prior to placing each well into service will insure safe drinking from an uncontaminated aquifer. This alternative therefore, is considered to protect the human health of the residents of this area.

Continued operation of the gradient control well and spray-irrigation treatment system will protect the environment near the landfill.

b) Compliance with ARARs New residential wells would be completed in the Ironton-Galesville aquifer which is believed to be uncontaminated. These wells would then supply a source of safe drinking water. Therefore this alternative is considered to be in compliance with MDH RAL and the Multiple Contaminant criteria.

Design and construction of new residential wells will follow the guidelines and requirements specified by the MDH Well Construction Codes as described earlier. In particular, any well drilled through the contaminated zone will meet specific requirements of the MDH within the Well Advisory Area surrounding the landfill. The new wells will be connected to the existing residential homes in compliance with MDH Plumbing Codes. This alternative is therefore, considered to be in compliance with the well design and well construction ARARs.

4. Residential Cluster Wells

Two cluster wells system would be installed to provide water for the 10 affected homes. (One resident would be drilled a deeper individual well due to the distance to other clusters.) The wells would be drilled to the Ironton-Galesville aquifer. Service lines would be installed from a well to each resident in a cluster. Residents in each cluster would need to work together to operate and maintain the system.

a) Overall Protection of Human Health and Environment Installation of new cluster wells will supply these residents with a long-term source of uncontaminated potable water. This will be accomplished by drilling new wells to the Ironton-Galesville aquifer which is currently believed to be unaffected by the contaminants and which is unlikely to become contaminated. Sampling prior to placing each well into service will insure safe drinking water from an uncontaminated aquifer. This alternative, therefore, is considered to protect the human of the residents of this area.

Continued operation of the gradient control well and spray-irrigation treatment system will protect the environment near the landfill.

b) Compliance with ARARs Cluster wells would be completed in the Ironton-Galesville aquifer which is considered to be uncontaminated. These wells would supply a source of safe drinking water. Therefore this alternative is considered to be in the compliance with the MDH RAL and the Multiple Contaminant criteria.

Design and construction of new residential wells will follow the guidelines and requirements specified by the MDH Well Construction Codes as described earlier. In particular, any well drilled through the contaminated zone will meet specific requirements of the MDH within the Well Advisory Area surrounding the landfill. The new wells and distribution piping will be connected to the existing residential homes in compliance with MDH Plumbing Codes. This alternative is, therefore, considered to be in compliance with the well design and well construction ARARs.

5. Public Water Supply

This alternative consists of installation of a water distribution system to supply public water to 10 homes near the landfill.

a) Overall Protection of Human Health and Environment Since water would be obtained from the city of Oakdale municipal water supply system, this system would provide a source of safe drinking water to the residents. In addition future migration of the plume would not adversely affect neighboring wells as these homes would also be connected to the system. Therefore, this alternative would protect the human health of the residents in this area.

Continued operation of the gradient control well and spray-irrigation treatment system will protect the environment near the landfill.

b) Compliance with ARARs Since the source of safe drinking water would be from an approved public system and outside the multiple contaminant contaminated area, this alternative would meet the MDH RAL and Multiple Contaminant criteria.

Installation of this public water system would come under the review of the MDH and meet the requirements for the installation of a public water supply as mandated by the MDH. This alternative therefore would meet the ARARs including MDH Public Water Supply Codes and Plumbing Codes.

6. Summary of Threshold Criteria

The no action alternative does not meet the criteria of overall protection of human health and environment. Likewise, it is not in compliance with the ARARs. The evaluation of this alternative does provide a basis for comparison with the remaining alternatives and may also provide a justification for other remedial action.

The other four alternatives including GAC filters, new residential wells, residential cluster wells and public water supply do pass the criteria of overall protection of human health and environment. In addition, each of these alternatives can be constructed and operated in order to comply with ARARs.

B. Primary Balancing Criteria

The five primary balancing criteria include long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability and cost. In order to evaluate the long-term drinking water supply alternatives a ranking system was developed for these five criteria, weighted as a percentage of 100 on the basis of their relative importance. Table D shows a ranking of the alternatives for each criteria based on this ranking system.

TABLE D

Criterion	Weighting	Granular Activated Carbon Filters	New Residential Wells	Residential Cluster Wells	Public Water Supply
Long-Term Effectiveness and Permanence	40 points	20	20	20	40
Reduction of Toxicity Mobility, or Volume through Treatment	20 points	20	20	20	20
Short-Term Effectiveness	10 points	10	5	5	5
Implementability	20 points	20	20	10	20
Cost	10 points	0	0	5	5
Totals	100 points	70	65	60	90

Long-term effectiveness and permanence was ranked at 40%; reduction of toxicity, mobility or volume through treatment was ranked at 20%; short-term effectiveness was ranked at 10%; implementability was ranked at 20%; and cost was ranked at 10%, for a total of 100%.

The different alternatives were then compared to the ranking criteria and determined as either satisfactory meeting, partially meeting, or not meeting those criteria. Those alternatives which satisfactorily met the criteria received the maximum percentage points for that criteria. Alternatives which partially meet criteria requirements received half credit.

Ranking of costs were based on the relative cost of the alternative compared to the no action alternative. Alternatives which have a present value cost of less than $250,000 received full credit. Alternatives ranging in cost from $250,000 to $500,000 received partial credit, while alternatives over $500,000 received no points.

The following information highlights the reasoning behind the determination that a given alternative did or did not meet the criteria.

1. No Action

The no action alternative does not meet the threshold criteria. In order to compare the various alternatives, the costs of the no action alternative was calculated.

The cost of the no action alternative would be substantial due to the amount of monitoring which would be necessary to access the ground water quality in the residential homes in the vicinity of the landfill. It is estimated that the annual cost of ground water monitoring would be approximately $67,200 (Table 4). There are no capital costs with this alternative. The present value of 20 years of ground water monitoring only would be $572,000.

2. Granular Activated Carbon Filters

a) Long-Term Effectiveness and Permanence This alternative has the advantages that GAC filtration is a proven technology in the capture of most VOC contaminants and that it may be easily discontinued if the ground water was to reach acceptable contaminant levels. The long-term permanence is reduced by the continued high maintenance required to change filters and carbon. Implementation of this alternative would not change the current ground water flow pattern, thus keeping the contaminant plume in its present location. Due to the conflicting attributes, only partial credit was given.

b) Reduction of Toxicity, Mobility, or Volume Through Treatment The gradient control well and spray-irrigation systems provide removal and treatment of contaminated ground water from the landfill. Continued operation of this system is an integral part of all evaluated alternatives; therefore, meeting the requirements of this criterion.

c) Short-Term Effectiveness This alternative may cause slight exposure of workers to contaminants during installation of the GAC filters. This alternative can be immediately implemented and, therefore, meets the requirements of the criterion.

d) Implementability This alternative is a proven technology, with readily available materials and service and, therefore, meets the requirements of this criterion. Although there is limited administration, access to each residential home on a regular basis would be required.

e) Cost While this alternative requires a relatively low initial capital investment, it yields relatively high annual operating costs due to maintenance and quarterly monitoring. This high annual operating cost was deemed unacceptable and, therefore, this alternative does not meet the requirements of this criterion.

It is assumed that the homeowner would retain responsibility for power costs; tank, pump and well maintenance; and future replacement.

The capital cost for installing GAC filters in 7 additional homes would be approximately $23,000. The annual operating cost would be $74,6000. The present value would be $658,000 for 10 homes. This reflects direct costs and does not include indirect costs of review of data, regulatory compliance and other management tasks by the Counties.

3. New Residential Wells

a) Long-Term Effectiveness and Permanence This alternative may introduce a risk of extending the contamination into a previously uncontaminated aquifer during well construction or pumping. Proper installation of these wells should greatly minimize this risk. Abandoned residential wells may be available for future ground water monitoring. Because of the potential for aquifer cross contamination this alternative only partially meets the requirements of this criterion.

b) Reduction of Toxicity, Mobility, or Volume through Treatment The gradient control well and spray-irrigation system provides removal and treatment of contaminated ground water from the landfill. Continued operation of this system is an integral part on any alternative, therefore meeting the requirements of this criterion.

c) Short-Term Effectiveness Installation of these wells would require drilling through a contaminated zone with a slight exposure to contaminants. This alternative would require extensive time for completion of the needed wells and, therefore, only partially meets the requirements of this criterion.

d) Implementability This alternative is a feasible technology, with readily available materials and service and, therefore, meets the criterion requirements. Access would be necessary to each residential home for installation of this alternative.

e) Cost The costs associated with this alternative consist of a significant initial capital investment and annual monitoring. As with the GAC filters, it is assumed that the homeowner would retain responsibility for power costs; tank, pump and well maintenance and future replacement. Monitoring would be conducted at each well. The capital cost for 10 homes is $252,000 and the annual cost for 10 homes is $39,300. The present value of capital investment and monitoring for 20 years for the 10 homes is approximately $587,000. This reflects direct costs and does not include indirect costs of review of data, regulatory compliance and other management tasks by the Counties. This alternative does meet the requirements of this criterion.

4. Residential Cluster Wells

a) Long-Term Effectiveness and Permanence This alternative may introduce a risk of extending the contamination into a previously uncontaminated aquifer. Proper installation of these wells should greatly minimize this risk. Abandoned residential wells may be available for future ground water monitoring. Because of the higher risk of failure this alternative only partially meets the requirements of this criterion.

b) Reduction of Toxicity, Mobility, or Volume Through Treatment The gradient control well and spray-irrigation system provides removal and treatment of contaminated ground water from the landfill. Continued operation of this system is an integral part of any alternative, therefore meeting the requirements of this criterion.

c) Short-Term Effectiveness Installation of these wells would require drilling through a contaminated zone with a slight exposure to contaminants. This alternative would require a homeowners agreement prior to construction. This could significantly delay drilling and implementation. Therefore, this alternative only partially meets the requirements of this criteria.

d) Implementability This alternative is a feasible technology, however, problems concerning ownership, well location, maintenance, replacement and operating costs make this alternative less feasible. This alternative assumes no government involvement in the administration, therefore a homeowners association or similar agreement would be required for implementation of this alternative. Therefore, this alternative was given partial credit.

e) Cost The costs associated with this alternative are initial capital investment, annual operating and monitoring and well replacement costs. The capital cost is $122,000 for 10 homes and

the annual cost is $32,400 for 10 homes. The present value of these costs for the 10 homes over 20 years is approximately $398,000. This alternative partially meets the requirements of this criterion.

5. Public Water Supply

a) Long-Term Effectiveness and Permanence Connection to the city of Oakdale municipal water system provides a source of safe drinking water to the residents. Extensive ground water monitoring of residential wells would be eliminated. This alternative has the advantage that, once installed, it provides a permanent solution and, therefore, meets the requirements of this criterion.

b) Reduction of Toxicity, Mobility, or Volume Through Treatment The gradient control well and spray-irrigation treatment system provides removal and treatment of contaminated ground water from the landfill. Continued operation of this system is an integral part of all alternatives, therefore meeting the requirements of this criterion.

c) Short-Term Effectiveness This alternative partially meets the requirement of short-term effectiveness. This solution cannot be immediately implemented; however, exposure of workers to contaminants is eliminated. A limited number of homes could be serviced within six months but the total project could require up to 12 months to complete.

d) Implementability Agreements between the Counties, Lake Elmo and Oakdale would need to be secured before this alternative could be implemented. Easements would be required for a portion of the distribution line. Ongoing administration of this alternative would be handled by the city of Lake Elmo. This alternative is a proven technology, with readily available materials and service and, therefore, meets the requirements of this criterion.

e) Cost This alternative reduces the relatively high annual operating costs associated with GAC filter maintenance and quarterly testing, but requires a significant initial capital investment. The capital cost for 10 homes is $400,000 and the annual cost for 10 homes is $2,469. The present value costs for this alternative are $400,000. Annual operating and replacement costs of $2,469 per year would be paid by residents through water billings. Due to this high initial investment by relatively low annual costs, this alternative received only partial credit.

6. Summary of the Primary Balancing Criteria

The summary table of the primary balancing criteria is found in Table C at the beginning of this section. It can be seen from these balancing criteria that the public water supply option receives the greatest number of points followed by GAC filters, new residential wells and residential cluster wells. The no action alternative is not an acceptable alternative for supplying water, but does provide a means of cost comparison.

C. Modifying Criteria

The modifying criteria includes community acceptance and support agency (U.S. Environmental Protection Agency (EPA)) acceptance.

i. Community Acceptance This analysis of community acceptance is based on the Counties' long-term relationship with the city and homeowners within the service area and reflects feedback from various community meetings discussing remedial actions at the Site, including feedback on the Proposed Plan.

1. No Action

The local community is opposed to no action and, in fact, has been quite insistent that additional steps be taken to supply a source of safe drinking water.

2. Granular Activated Carbon Filters

Installation of GAC filters in three homes within the Well Advisory Area during the past several years has generally not been accepted by the residents. Other home owners have also expressed similar negative viewpoints. Some residents have indicated that this alternative as implemented to date has negatively impacted real estate transactions. The city of Lake Elmo would likely continue to restrict development in this area due to the ground water contamination.

3. New Residential Wells

This alternative is acceptable to a portion of the community but would not alleviate public concerns of long-term water quality. Some residents may still feel that this alternative would limit real estate transactions. The city of Lake Elmo would likely continue to restrict development in this area due to the ground water contamination.

4. Residential Cluster Wells

Due to difficulties of joint ownership, well location and neighborhood coordination this alternative would be difficult to implement. This alternative would alleviate concerns about long-term water quality. Administrative issues would limit real estate transaction. The City of Lake Elmo would likely continue to restrict development in this area due to the ground water contamination.

5. Public Water Supply

This alternative is highly acceptable to the community. Implementation of this alternative would lift concerns of a safe drinking water supply and perceived or real limitations on real estate transactions.

6. Summary of Community Acceptance

The community acceptance of these alternatives ranges from unacceptable for the no action alternative to highly acceptable for the public

water supply alternative. Both the residents and the city of Lake Elmo prefer the public water supply alternative. The Counties also prefer the public water supply alternative.

ii. Support Agency (U.S. Environmental Protection Agency (EPA) Acceptance

The public water supply alternative is acceptable to the EPA.

9. Selected Remedy

The selected remedy for the second operable unit is a municipal drinking water supply system for the remediation goal of supplying potable drinking water to 10 homes whose owners have received MDH drinking water well advisories not to use their existing well water for drinking or cooking. An integral part of this remedy is the continued operation of the gradient control well and spray-irrigation treatment system for the first operable unit which consists of four gradient control wells, two on-site spray-irrigation treatment areas and an off-site discharge to surface waters. The operation of the gradient control well and spray-irrigation treatment system is regulated under an NPDES permit.

The selected remedy is a part of a larger project to supply water to an additional 71 homes in a service area delineated in Figure 1. This larger project is outside of the scope of the Minnesota Environmental Response and Liability Act, Minn. Stat. ch. 115B.

The remediation goal for the second operable unit of supplying potable drinking water to the 10 homes as described above meets the ARARs previously identified. The estimated capital cost for the 10 homes is $400,000; the estimated annual costs for the 10 homes is $2,469; and the estimated present value for the 10 homes is $400,000.

10. Statutory Determinations

Protection of Human Health and the Environment

The selected remedy will provide adequate protection to the public health and the environment by providing potable water from the city of Oakdale munipical drinking water supply system. Continued operation of the gradient control well and spray-irrigation treatment system will protect the aquifers downgradient of the landfill from further releases from the landfill.

Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with the requirements for safe drinking water and will comply with design criteria and guidance for well construction and water supply systems established by the MDH:, i.e., the Plumbing Code (Minn. Rules ch. 4715); the Public Water Supply Codes (Minn. Rules ch. 4720); and Well Construction Codes (Minn. Rules ch. 4725).

The "To Be Considered" (TBCS) for this remedy is the Multiple Contaminant Criterion established by the MDH. By eliminating the exposure of the residents of the 10 homes with drinking water advisories, the selected remedy meets the TBCS for this operable unit.

Cost-Effectiveness

The selected remedy is cost-effective, primarily by reducing residential well monitoring costs.

Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable (MEP)

The selected remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable. The selected remedy was judged to provide the best long-term effectiveness and permanence by eliminating any possible contact with the contaminated ground water. The other three alternatives considered have some probability of exposure to the contaminated ground water through cross-contamination of aquifers and exposure from inadequately operating GAC filters. All four remedies evaluated were judged to equally reduce toxicity, mobility, or volume through treatment because, for purposes of this ROD, this criterion applied to the first operable unit, the on-site gradient control well and spray-irrigation treatment system. All of the remedies were judged to be equally effective in the short-term except for the GAC filter remedy which may have exposed filter installers to contaminated water, although the probably of this is very low. The remedies were judged to be equally implementable except for the residental cluster wells which likely would present administrative difficulties in the operation and maintenance of this remedy. The selected remedy and the residential cluster remedy were judged to be equally the most cost-effective because these remedies significantly reduced the residental well monitoring costs. The combined effect of this ranking was that the municipal drinking water supply system was the overall best remedy.

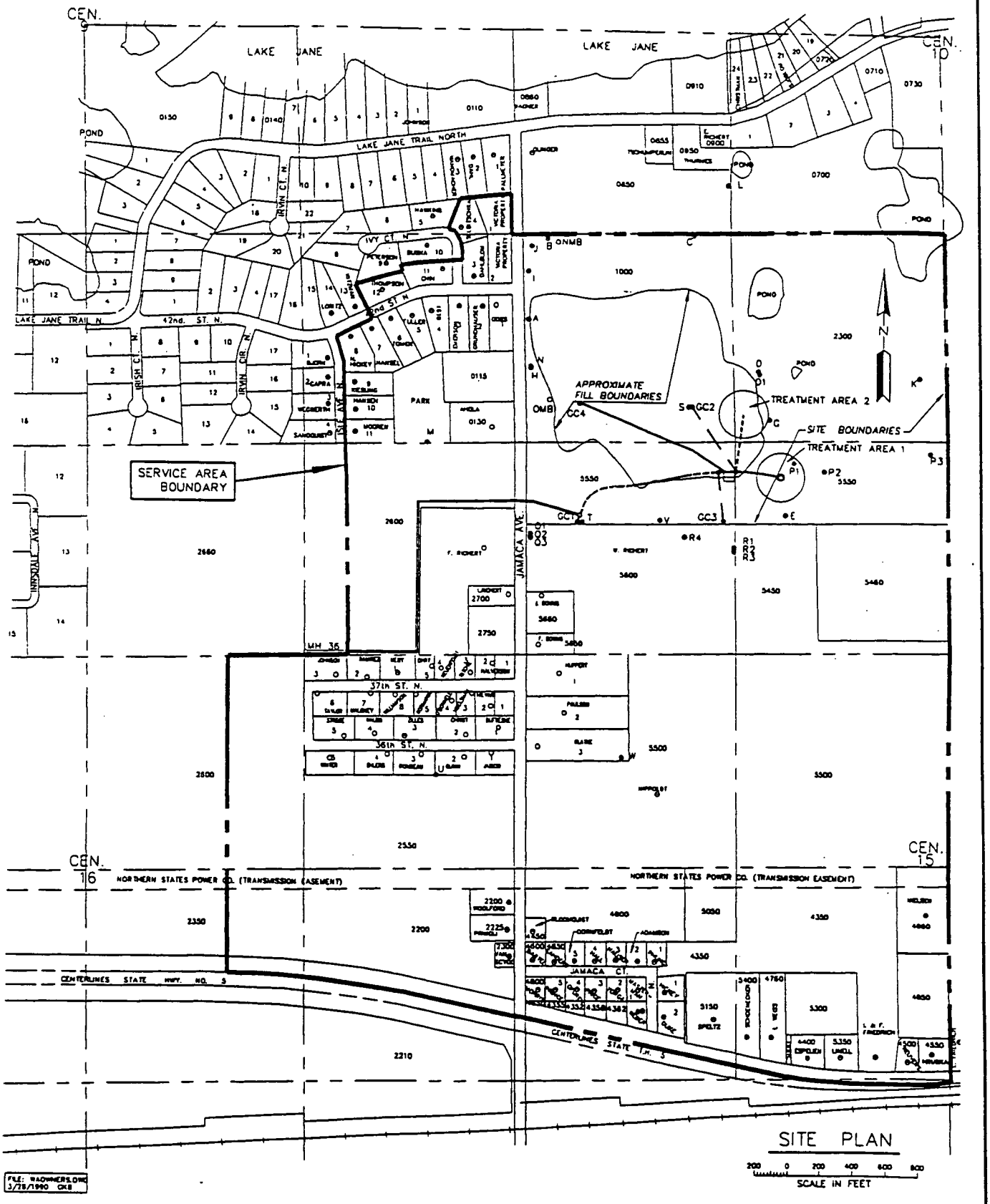
Preference for Treatment as a Principal Element

The selected remedy satisfies the preference for treatment in that the on-site gradient control well and spray-irrigation treatment system will continue to operate to prevent the release of contaminants into the aquifers downgradient of the landfill.

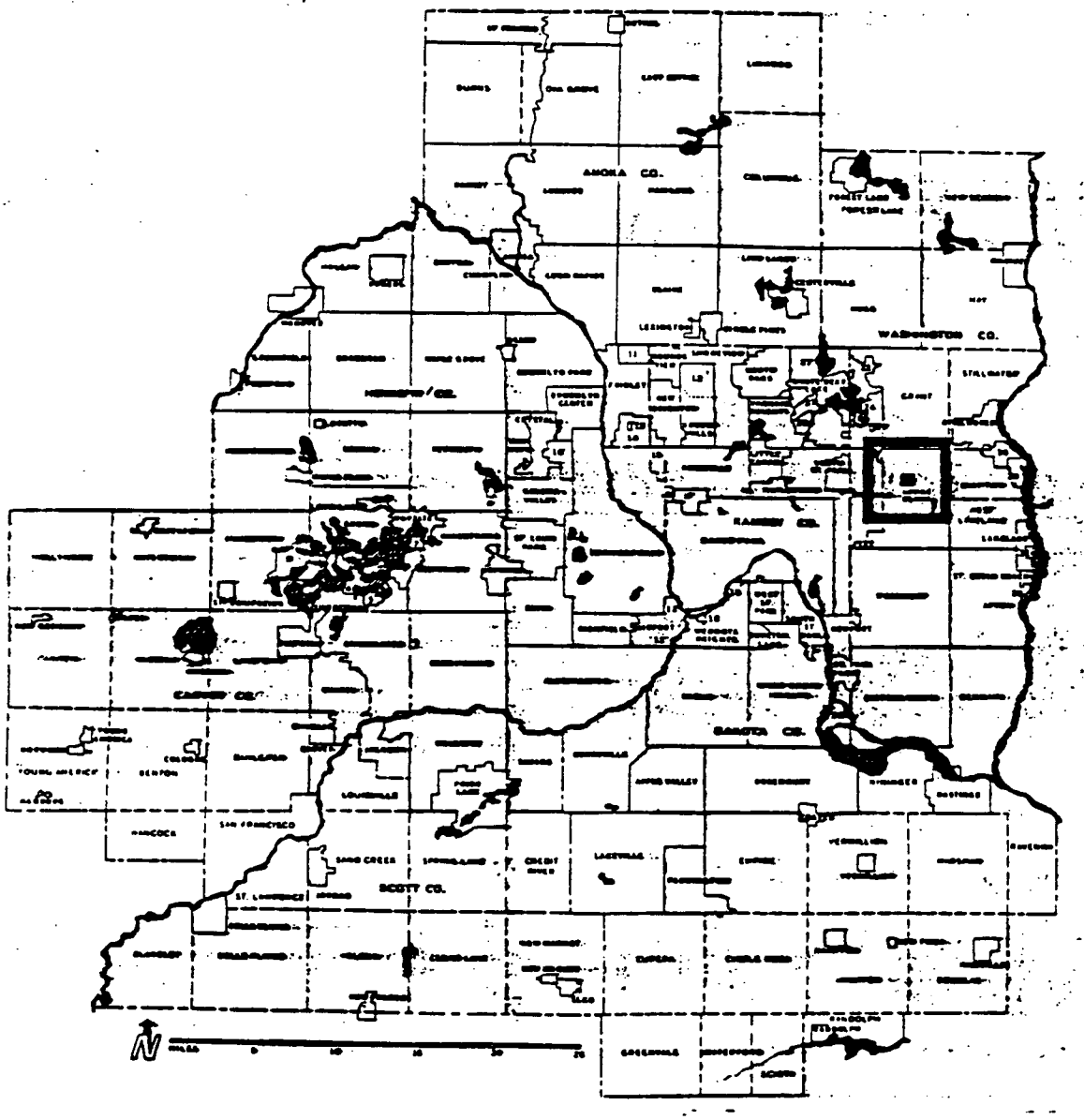
11. Documentation of Significant Changes

The selected remedy is the same as the proposed remedy for the 10 residential homes with MDH drinking water well advisories as described in the Proposed Plan and RI/FS Report so that there are no significant changes.

FIGURES



WASHINGTON COUNTY SANITARY LANDFILL NO. 1	Wenck Associates, Inc.	Consulting Engineers	June 1990
Vicinity Map		1800 Pioneer Creek Dr. Maple Plain, MN 55359	Fig. 1

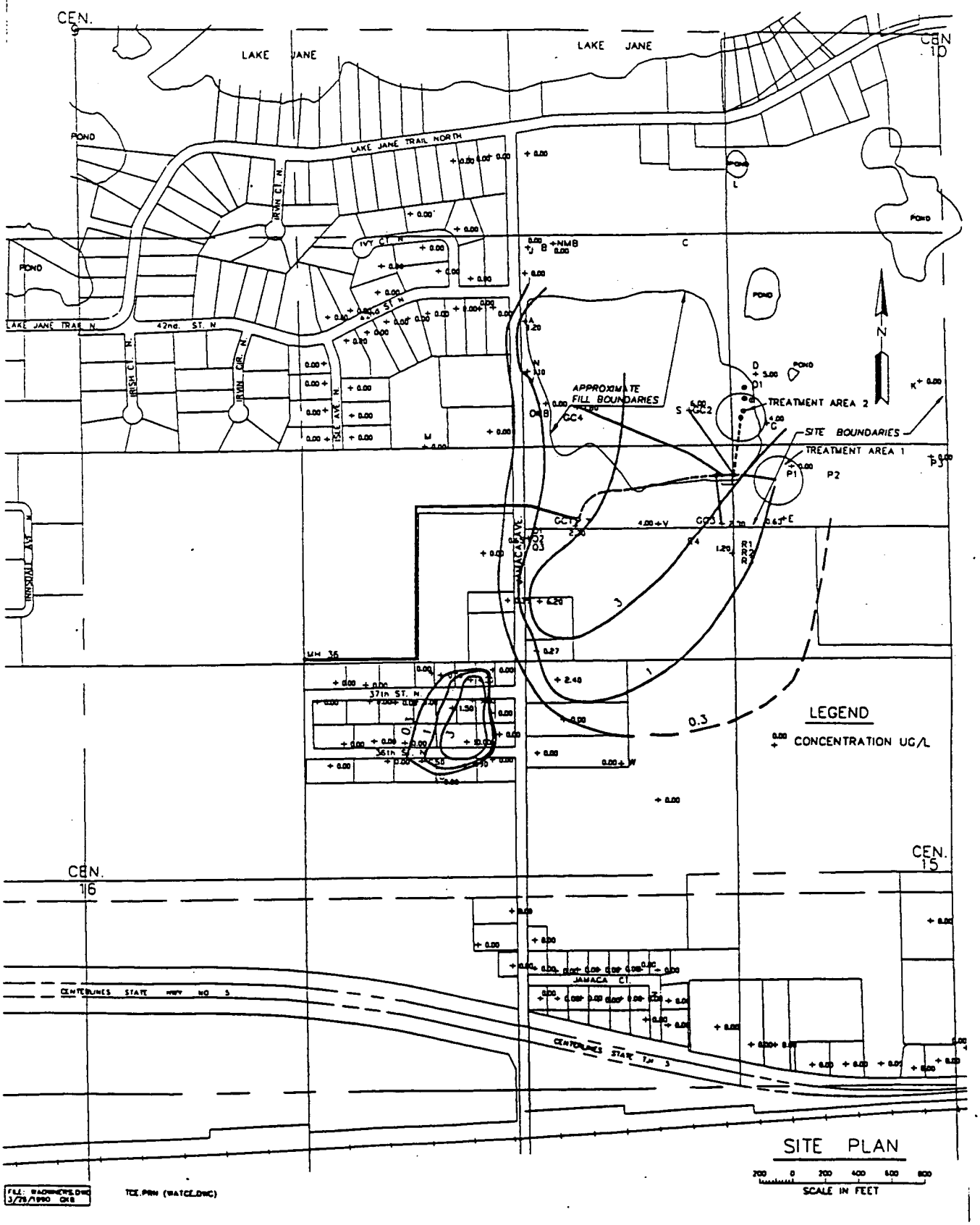


WASHINGTON COUNTY LANDFILL

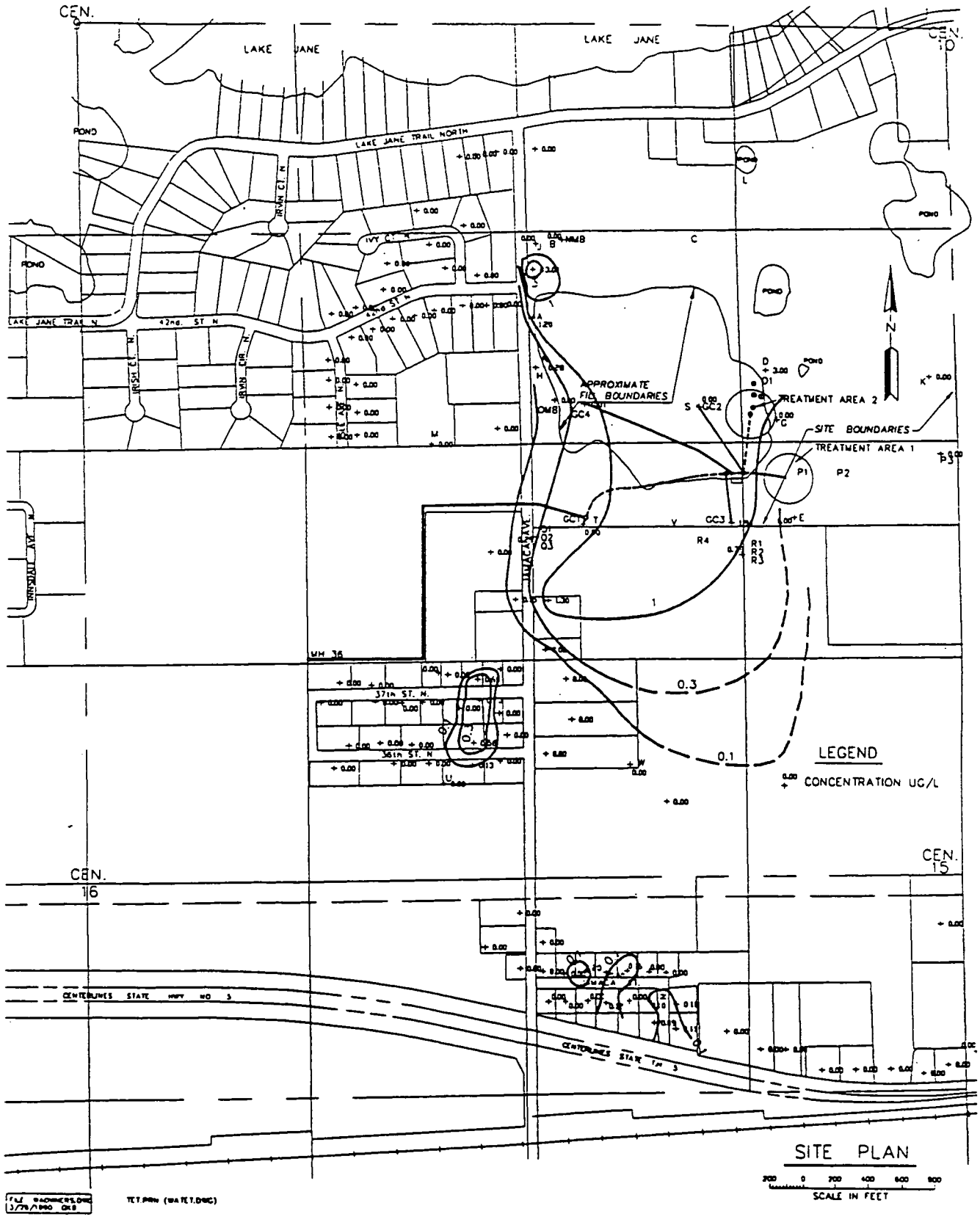
SITE LOCATION

FIGURE 1A.

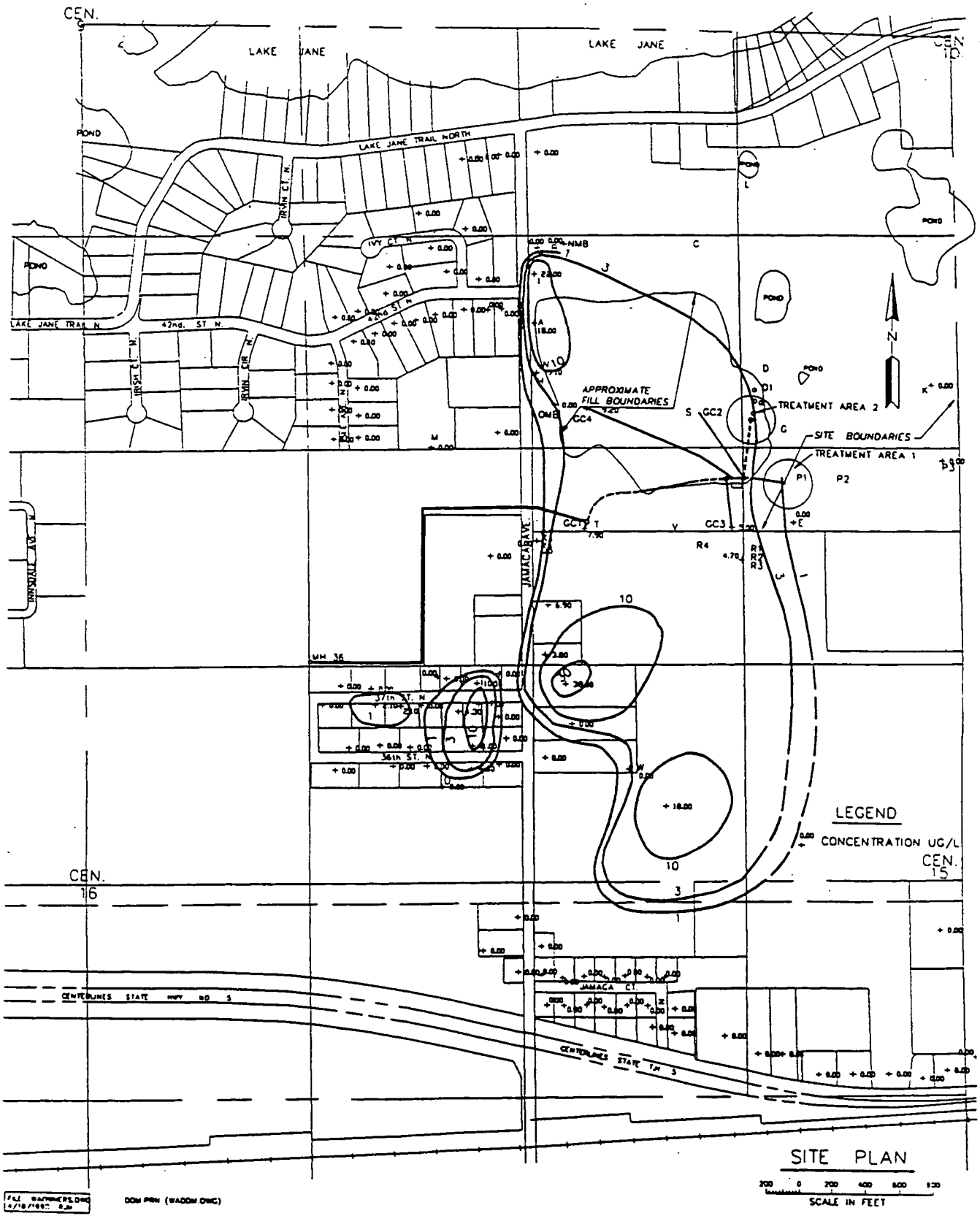
Figure 1B. Site location, Washington County Landfill. Scale 1:24,0



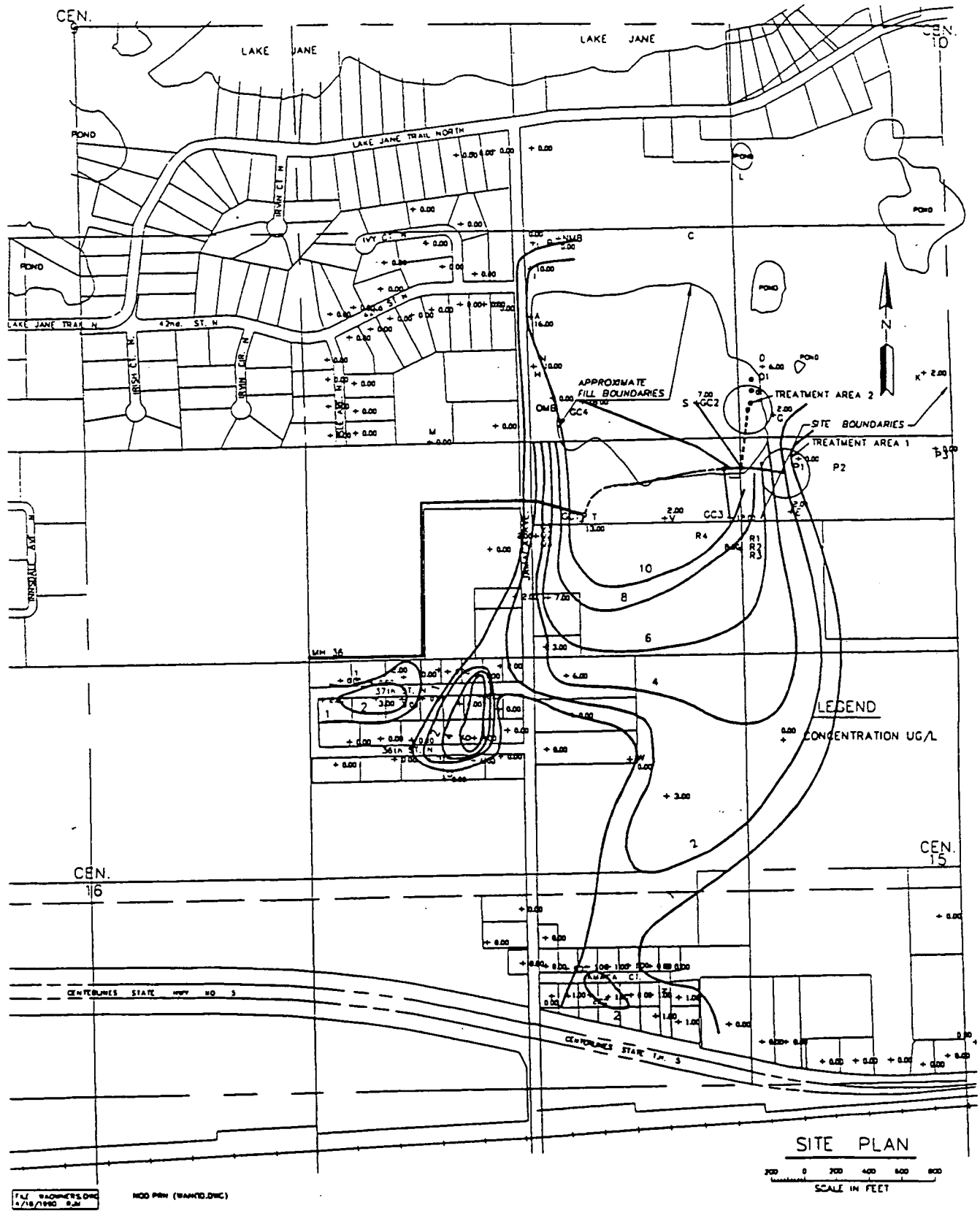
WASHINGTON COUNTY SANITARY LANDFILL NO.1	Consulting Engineers	April 19
Trichloroethylene Isoconcentration Map	Wenck Associates, Inc. 1800 Pioneer Creek Dr. Maple Plain, MN 55359	Fig. 2



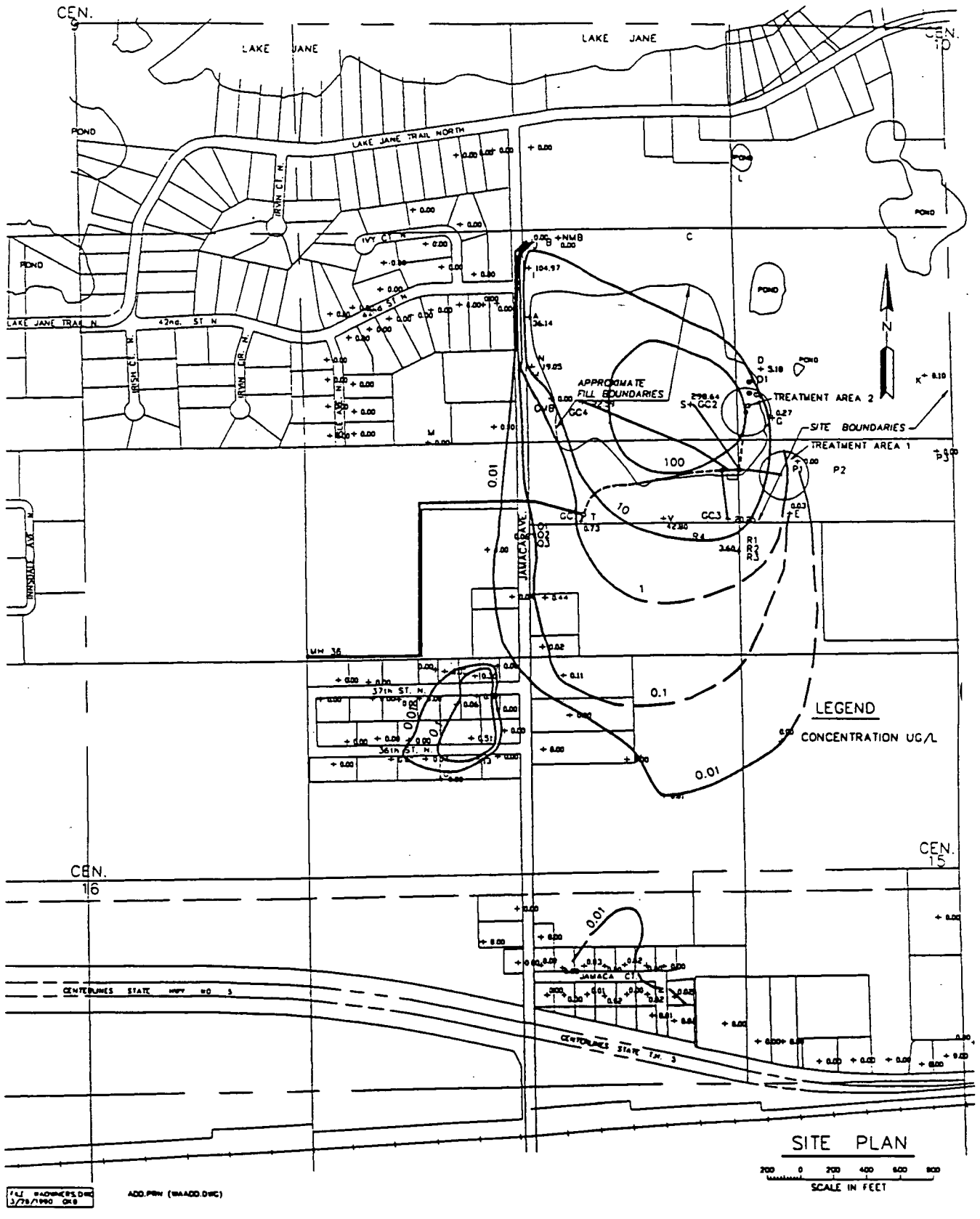
WASHINGTON COUNTY SANITARY LANDFILL NO. 1	Consulting Engineers	April 1990
Tetrachloroethylene Isoconcentration Map	Wenck Associates, Inc. 1800 Pioneer Creek Dr. Maple Plain, MN 55359	Fig. 3



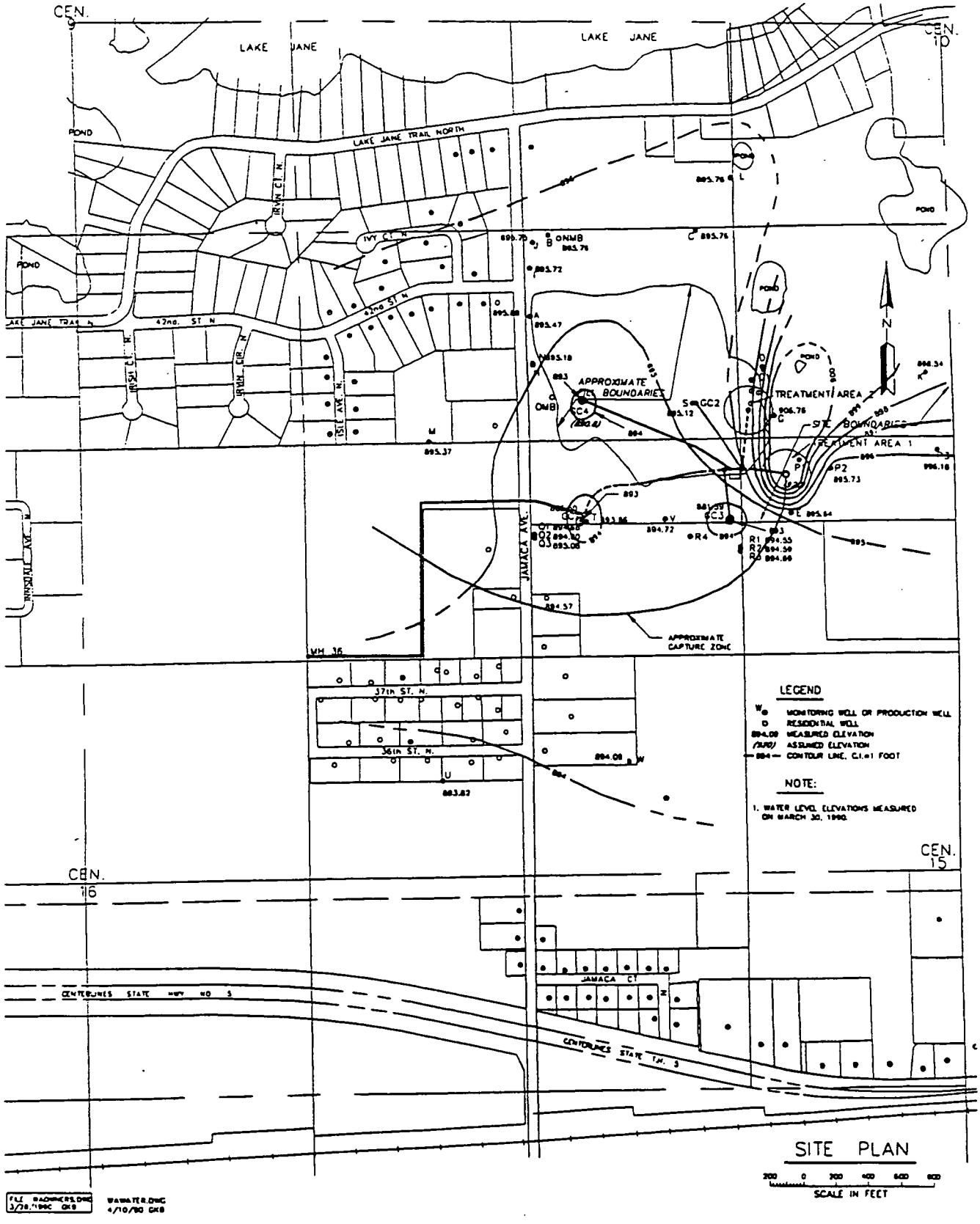
WASHINGTON COUNTY SANITARY LANDFILL NO. 1	Consulting Engineers	April 199
Dichlorodifluoromethane Isoconcentration Map	Wenck Associates, Inc. 1800 Pioneer Creek Dr. Maple Plain, MN 55359	Fig. 4



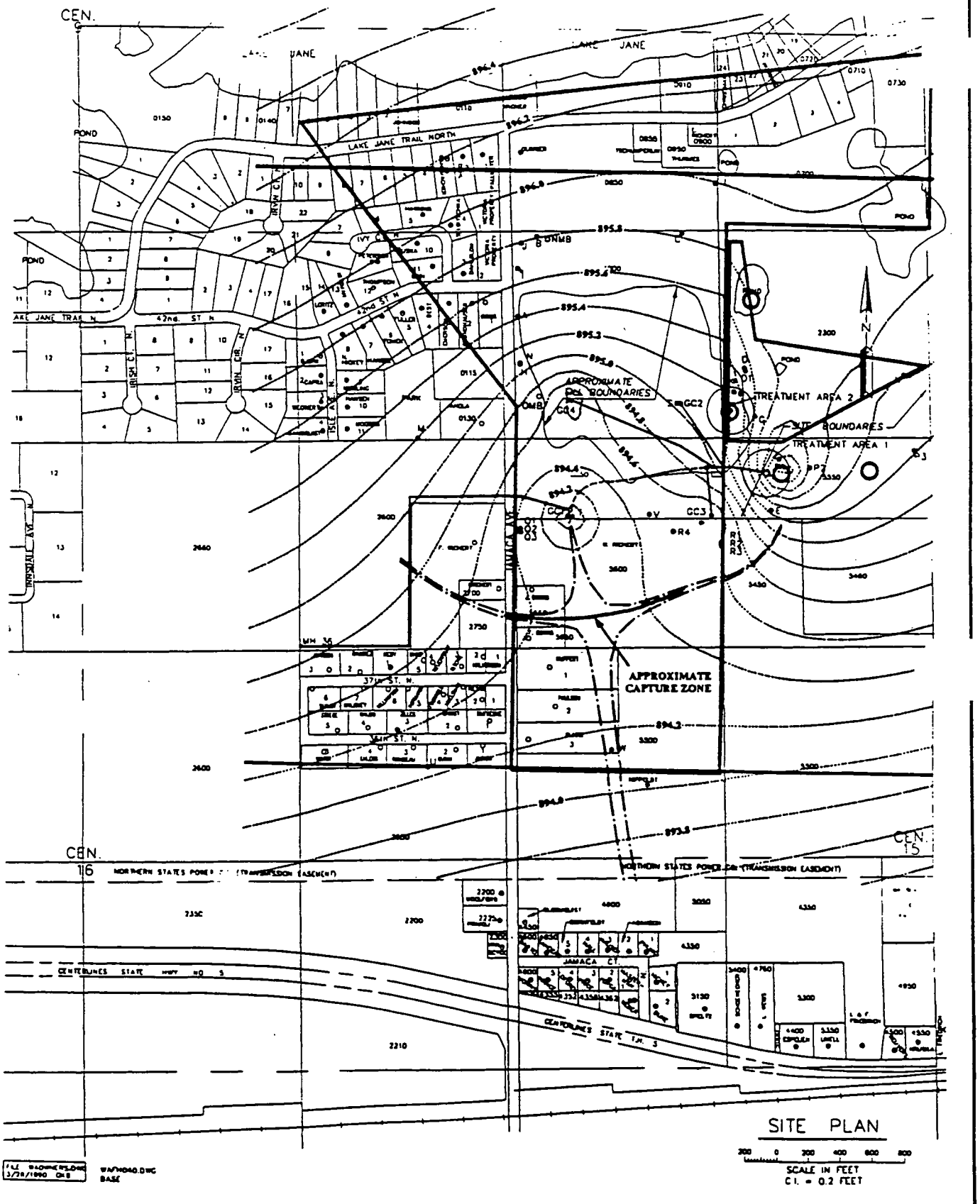
WASHINGTON COUNTY SANITARY LANDFILL NO. 1	Consulting Engineers	April 1990
Number of Detections Contour Map	Wenck Associates, Inc. 1800 Pioneer Creek Dr. Maple Plain, MN 55359	Fig. 5



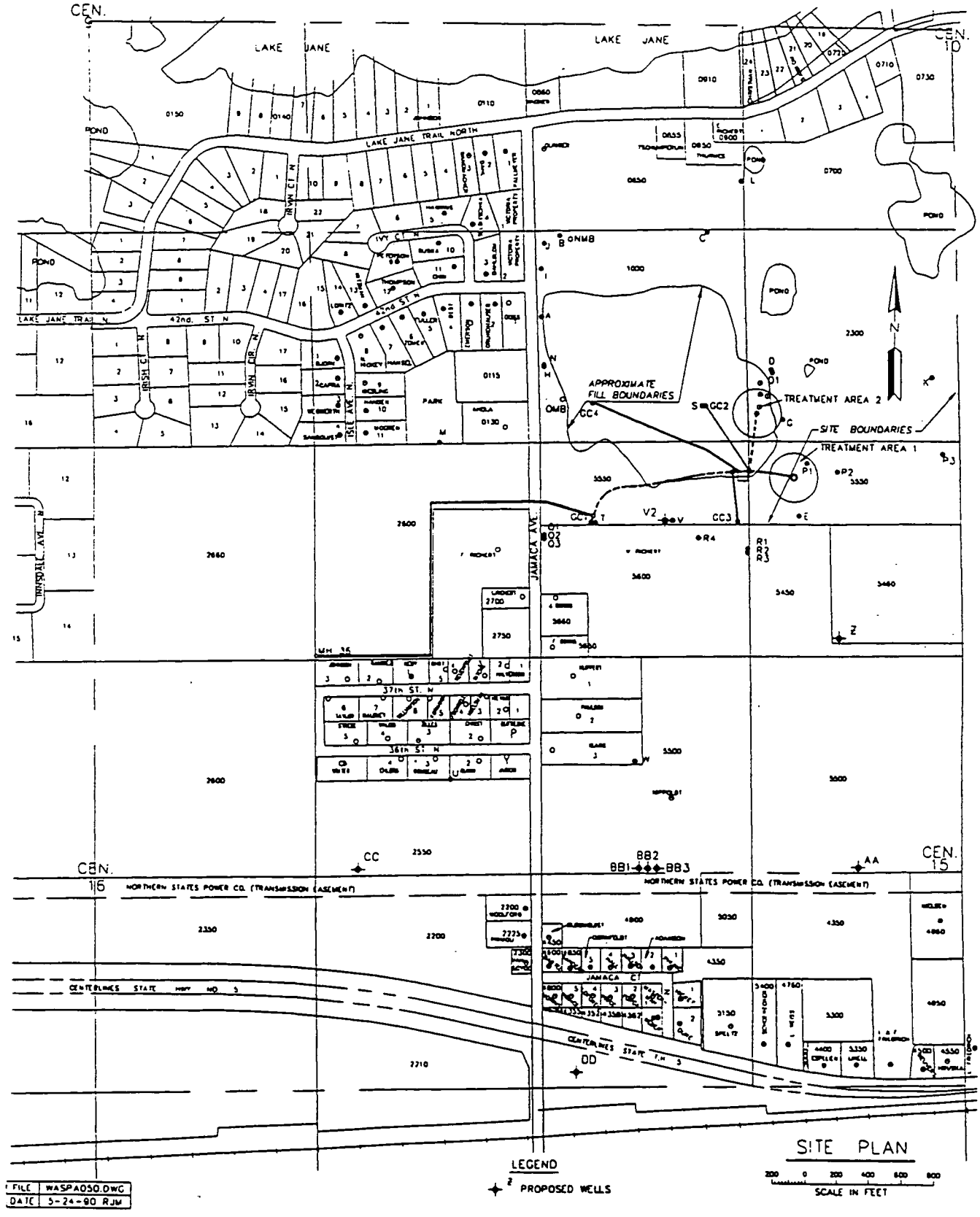
WASHINGTON COUNTY SANITARY LANDFILL NO. 1	Consulting Engineers	April 1990
Additivity Contour Map	Wenck Associates, Inc. 1800 Pioneer Creek Dr. Maple Plain, MN 55359	Fig. 6



WASHINGTON COUNTY LANDFILL NO. 1	Consulting Engineers	April 1990
Water Level Contour Map - Hand Contoured	Wenck Associates, Inc. 1800 Pioneer Creek Dr. Maple Plain, MN 55359	Fig. 7



WASHINGTON COUNTY LANDFILL NO. 1	Consulting Engineers	April 1
Water Level Contour Map - Modeled	Wenck Associates, Inc. 1800 Pioneer Creek Dr. Maple Plain, MN 55359	Fig. 8



WASHINGTON COUNTY SANITARY LANDFILL NO. 1	Wenck Associates, Inc.	Consulting Engineers 1800 Pioneer Creek Dr. Maple Plain, MN 55359	May 1990
Proposed Monitoring Well Locations			Fig. 10

TABLES

TABLE 1

SUMMARY OF RESIDENTIAL WATER QUALITY
WASHINGTON COUNTY SANITARY LANDFILL NO. 1

NORTHWEST AREA	Address	Drinking Water Advis.	Confirm. Detections	Confirmed BPQL	Non-Detection
IVY COURT					
1. Richard Selbitschka	4235 Ivy Court				X
2. Douglas Dahlblom	4215 Ivy Court				X
3. Roger Chin	4220 Ivy Court				X
42nd STREET					
4. Mark Thompson	8860-42nd St.				X
5. Roger Goss	8989-42nd St.				X
6. Arthur Grundhauser	8949-42nd St.				X
7. David Emerson	8909-42nd St.				X
8. William Best	8895-42nd St.				X
9. Richard Fuller	8875-42nd St.				X
10. Karl Tomek	8855-42nd St.				X
11. Michael Hansel	8835-42nd St.				X
12. Neil Hickey	8815-42nd St.				X
ISLE AVENUE					
13. Clarence Kiesling	4111 Isle Ave.				X
14. Steve Hansen	4077 Isle Ave.				X
15. Dennis Mogren	4033 Isle Ave.				X
JAMACA AVENUE					
16. Ken Omath	4260 Jamaca Ave.				X
17. Lake Elmo					X
New Maint. Bldg.	4259 Jamaca Ave.				
18. Fire Station No. 2					X
19. Walter Ahola	4026 Jamaca Ave.				X

BPQL = Below Practical Quantitation Limit

TABLE 1 (cont.)

SOUTHWEST AREA	Address	Drinking Water Advis.	Confirm. Detections	Confirmed BPQL	Non-Detection
JAMACA AVENUE					
20. Mrs. Fred Richert	3870 Jamaca Ave.				X
21. Weldon Richert	3855 Jamaca Ave.				X
22. Lavonne Richert	3812 Jamaca Ave.		X		
23. Jeff Downs	3793 Jamaca Ave.	X			
24. Francis Downs	3759 Jamaca Ave.	X			
25. Lynn Halverson	3740 Jamaca Ave.	X			
26. Clair Huppert	3733 Jamaca Ave.	X			
27. Gary Paulson	3669 Jamaca Ave.			X	
28. Donald Klatke	3663 Jamaca Ave.				X
29. Mervin Nippoldt	3501 Jamaca Ave.	X			
37th STREET					
30. Michael Ritchie	8938-37th St.	X			
31. Gary Neuenfeldt	8914-37th St.				X
33. J. Ohrt	8894-37th St.				X
33. David Neby	8862-37th St.		X		
34. Ronald Ramirez	8834-37th St.				X
35. Gordon Johnson	8804-37th St.				X
36. John Taylor	8801-37th St.		X		
37. Robert Maloney	8831-37th St.		X		
38. Glen Williamson	8861-37th St.		X		
39. Todd Kormanik	8891-37th St.				X
40. Thomas O'Donnell	8909-37th St.	X			
41. Gary Huelsman	8939-37th St.	X			
42. Michael Hilyar	8961-37th St.				X
36th STREET					
43. David DuFresne	8968-36th St.			X	
44. Arlyn Christ	8928-36th St.	X			
45. Timothy Zilles	8890-36th St.				X
46. Mark Waldo	8838-36nd St.				X
47. Raymond Strege	8808-36th St.				X
48. Robert Winter	8809-36th St.				X
49. Richard Ehlers	8839-36th St.				X
50. Jeffrey Rondeau	8879-36th St.		X		
51. Richard Quinn	8929-36th St.	X			
52. Thomas Jasicki	8969-36th St.				X

BPQL = Below Practical Quantitation Limit

TABLE 1 (cont.).

SOUTH AREA	Address	Drinking Health Advis.	Confirm. Detections	Confirmed BPQL	Non-Detection
JAMACA AVENUE					
53. Michael Woolford	3476 Jamaca Ave.				X
54. Daniel Primoli	3440 Jamaca Ave.			X	
55. Peter Bloomquist	3435 Jamaca Ave.				X
56. Jerome Bartel	3415 Jamaca Ave.				X
57. Lester VanScyoc	3412 Jamaca Ave.			X	
58. James Morris	3351 Jamaca Ave.				X
JAMACA COURT					
59. Richard Sanders	9038 Jamaca Court				X
60. Ronald Dornfeld	9060 Jamaca Court		X		
61. Brian Hall	9090 Jamaca Court		X		
62. Stanley Hauser	9110 Jamaca Court		X		
63. Kurt Adamson	9130 Jamaca Court			X	
64. Quang Phung/ Sandra Groth	9150 Jamaca Court				X
65. Michael & Thomas Hickey	9170 Jamaca Court			X	
66. Ronald Duke	9186 Jamaca Court			X	
67. Paul Weber	9179 Jamaca Court				X
68. James Masterman	9165 Jamaca Court			X	
69. Daniel Yorga	9115 Jamaca Court			X	
70. David Price	9089 Jamaca Court			X	
71. Robert Lofgren	9055 Jamaca Court		X		
72. Diane Prince	9033 Jamaca Court		X		
STILLWATER BLVD.					
73. Robert Speltz	9250 Stillwater Blvd.				X
74. Robert Schoenecker	9280 Stillwater Blvd.				X
75. Larry Weiss	9302 Stillwater Blvd.				X
76. Delray Espelien	9340 Stillwater Blvd.				X
77. Roger Linell	9402 Stillwater Blvd.				X
78. Irvin Friedrich	9434 Stillwater Blvd.				X
79. Michael Reuvers	9442 Stillwater Blvd.				X
80. Donna Hruska	9492 Stillwater Blvd.				X
81. Edmond Nielsen	9498 Stillwater Blvd.				X
	TOTAL	$\overline{10}$	$\overline{11}$	$\overline{10}$	$\overline{50}$

BPQL = Below Practical Quantitation Limit

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Aqu	Dis	Chloro methane	Methylene chloride	Chloro form	Dichloro fluoro methane	Dichloro difluoro methane	Trichloro fluoro methane	Vinyl chloride	1,1-Di chloro ethylene
MDH RAL's	Nov-88					48	57		1400	2100	0.15	7
36th & 37th Street												
C.Huppert	04-Oct-89	WAI	SHA									
C.Huppert	16-Nov-89	WAI	SHA		<0.02	<0.009	<0.008	0.93	46	<0.02	<0.02	<0.01
C.Huppert	16-Nov-89	MPCA	SHA		NQ	0.6	0.2	PP	PP	3.6	NQ	<0.2
C.Huppert	13-Dec-89	WAI	SHA		<0.02	<.009	<0.008	3.9	38	3.1	<0.02	<0.01
C.Huppert	13-Dec-89	WAI	SHA		<0.02	<0.09	<0.008	0.55	<0.5	0.66	<0.02	<0.01
C.Huppert	04-May-90	WAI	SHA		<0.02	<0.09	<0.008	0.55	<0.5	0.66	<0.02	<0.01
J.Downs	04-Oct-89	WAI	BAS					<1	1.1			
J.Downs	16-Nov-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
J.Downs	16-Nov-89	MPCA	BAS		NQ	PP	PP	PP	PP	0.5	NQ	<0.2
J.Downs	13-Dec-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	6.9	<0.02	<0.02	0.17
J.Downs	07-Feb-90	WAI	BAS									
J.Downs	30-May-90	WAI	BAS		<0.02	<0.09	<0.008	<0.05	2.0	<0.02	<0.02	<0.01
J.Downs-1	04-Oct-89	WAI	BAS					<1	<1			
J.Downs-1	16-Nov-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
J.Downs-1	13-Dec-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
J.Downs-1	30-May-90	WAI	BAS		<0.02	<0.09	<0.008	1.0	BPQL<2.0	<0.02	<0.02	<0.01
J.Downs-2	16-Nov-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
J.Downs-2	07-Feb-90	WAI	BAS									
F.Richert	16-Nov-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
F.Richert	16-Nov-89	MPCA	BAS		NQ	<1	<0.2	NQ	NQ	<0.5	NQ	<0.2
F.Richert	10-Jan-90	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
F.Downs	04-Oct-89	WAI	BAS									
F.Downs	16-Nov-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
F.Downs	16-Nov-89	MPCA	BAS		NQ	<1	<0.2	PP	PP	<0.5	NQ	<0.2
F.Downs	13-Dec-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	5.2	<0.02	<0.02	<0.01
F.Downs	10-Jan-90	WAI	BAS		<0.02	<0.009	<0.008	<0.05	3.8	<0.02	<0.02	<0.01
F.Downs	30-May-90	WAI	BAS		<0.02	<0.09	<0.008	<0.05	BPQL<2.0	<0.02	<0.02	<0.01
L.Richert	04-Oct-89	WAI	BAS									
L.Richert	16-Nov-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
L.Richert	16-Nov-89	MPCA	BAS		NQ	<1	<0.2	NQ	PP	<0.5	NQ	<0.2
L.Richert	13-Dec-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
L.Richert	10-Jan-90	WAI	BAS		<0.02	<0.009	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
L.Richert	30-May-90	WAI	BAS		<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Klatke	16-Nov-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Klatke	16-Nov-89	MPCA	BAS		NQ	<1	<0.2	NQ	NQ	<0.5	NQ	<0.2
D.Klatke	10-Jan-90	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
G.Huelsman	04-Oct-89	WAI	BAS					1.7	9			
G.Huelsman	16-Nov-89	WAI	BAS		<0.02	0.31	<0.008	<0.05	15	<0.02	<0.02	<0.01
G.Huelsman	16-Nov-89	MPCA	BAS		NQ	1.2	0.7	PP	PP	1.2	NQ	0.5
G.Huelsman	13-Dec-89	WAI	BAS		<0.02	0.31	<0.008	1.5	17	<0.02	<0.02	0.71
G.Huelsman	07-Feb-90	WAI	BAS									
G.Huelsman	30-May-90	WAI	BAS		<0.02	<0.09	<0.008	4.1	5.6	<0.02	<0.02	<0.01
G.Huelsman-1	04-Oct-89	WAI	BAS					2.6	6.6			
G.Huelsman-1	16-Nov-89	WAI	BAS		<0.02	0.096	<0.008	<0.05	14	<0.02	<0.02	<0.01
G.Huelsman-1	13-Dec-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
G.Huelsman-1	30-May-90	WAI	BAS		<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
G.Huelsman-2	16-Nov-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
G.Huelsman-2	07-Feb-90	WAI	BAS									
R.Ramirez	16-Nov-89	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Ramirez	10-Jan-90	WAI	BAS		<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
M.Nippoldt	10-Jan-90	WAI	BAS		<0.02	<0.009	<0.008	<0.05	36	<0.02	<0.02	<0.01
M.Nippoldt	25-Jan-90	WAI	BAS		<0.02	BPQL	<0.008	BPQL	24	<0.02	<0.02	<0.01
M.Nippoldt	27-Feb-90	WAI	BAS		<0.02	<0.09	BPQL	0.95	18	<0.02	<0.02	<0.01
M.Nippoldt	30-May-90	WAI	BAS		<0.02	<0.09	<0.008	1.6	19	<0.02	<0.02	<0.01
M.Ritchie	04-Oct-89	WAI	STP									
M.Ritchie	16-Nov-89	WAI	STP		<0.02	BPQL	<0.008	<0.05	3.2	<0.02	<0.02	<0.01
M.Ritchie	16-Nov-89	MPCA	STP		NQ	PP	<0.2	PP	PP	0.7	NQ	0.2
M.Ritchie	13-Dec-89	WAI	STP		<0.02	<0.009	<0.008	<0.05	10	<0.02	<0.02	0.38
M.Ritchie	30-May-90	WAI	STP		<0.02	<0.09	<0.008	<0.05	BPQL<2.0	<0.02	<0.02	<0.01

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Cis-1,2-dichloro ethylene	Trans-1,2-dichloro ethylene	Trichloro ethylene	Tetra chloro ethylene	Chloro ethane	1,1-Di chloro ethane	1,2-Di chloro ethane	1,1,1-Tri chloro ethane	1,1,2-Tri chloro ethane
MDH RAL's	Nov-88		70	70	31	6.6		810	3.8	200	14
36th & 37th Street											
C.Huppert	04-Oct-89	WAI			2.1					<1	
C.Huppert	16-Nov-89	WAI	<0.01	<0.01	1.4	<0.008	<0.02	0.13	<0.01	BPQL	<0.009
C.Huppert	16-Nov-89	MPCA	0.3	<0.2	2.5	<1	NQ	0.9	<0.2	0.9	<0.2
C.Huppert	13-Dec-89	WAI	0.26	<0.01	2.4	<0.008	<0.02	0.78	<0.01	0.76	<0.009
C.Huppert	13-Dec-89	WAI	<0.01	<0.01	1.4	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
C.Huppert	04-May-90	WAI	<0.01	<0.01	1.4	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Downs	04-Oct-89	WAI	<1		6.1	1.2		<1		<1	
J.Downs	16-Nov-89	WAI	<0.01	<0.01	4.9	0.67	<0.02	<0.01	<0.01	0.22	<0.009
J.Downs	16-Nov-89	MPCA	0.6	<0.2	8.6	2.2	NQ	0.6	<0.2	1.1	<0.2
J.Downs	13-Dec-89	WAI	0.40	<0.01	6.2	1.3	<0.02	0.39	<0.01	0.89	<0.009
J.Downs	07-Feb-90	WAI									
J.Downs	30-May-90	WAI	<0.01	<0.01	2.4	0.22	<0.02	<0.01	<0.01	<0.02	<0.009
J.Downs-1	04-Oct-89	WAI	<1		<1	<1		<1		<1	
J.Downs-1	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Downs-1	13-Dec-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Downs-1	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Downs-2	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Downs-2	07-Feb-90	WAI									
F.Richert	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
F.Richert	16-Nov-89	MPCA	<0.2	<0.2	<0.2	<1	NQ	<0.2	<0.2	<0.2	<0.2
F.Richert	10-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
F.Downs	04-Oct-89	WAI			<1					<1	
F.Downs	16-Nov-89	WAI	<0.01	<0.01	<0.02	0.13	<0.02	<0.01	<0.01	<0.02	<0.009
F.Downs	16-Nov-89	MPCA	PP	<0.2	0.6	PP	NQ	PP	<0.2	PP	<0.2
F.Downs	13-Dec-89	WAI	BPQL	<0.01	0.35	0.082	<0.02	<0.01	<0.01	<0.02	<0.009
F.Downs	10-Jan-90	WAI	BPQL	<0.01	0.27	BPQL	<0.02	<0.01	<0.01	<0.02	<0.009
F.Downs	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
L.Richert	04-Oct-89	WAI			<1					<1	
L.Richert	16-Nov-89	WAI	<0.01	<0.01	<0.02	0.32	<0.02	<0.01	<0.01	<0.02	<0.009
L.Richert	16-Nov-89	MPCA	<0.2	<0.2	0.6	PP	NQ	<0.2	<0.2	<0.2	<0.2
L.Richert	13-Dec-89	WAI	<0.01	<0.01	0.48	0.21	<0.02	<0.01	<0.01	<0.02	<0.009
L.Richert	10-Jan-90	WAI	<0.01	<0.01	0.39	0.15	<0.02	<0.01	<0.01	<0.02	<0.009
L.Richert	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Klatke	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Klatke	16-Nov-89	MPCA	<0.2	<0.2	<0.2	<1	NQ	<0.2	<0.2	<0.2	<0.2
D.Klatke	10-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Huelsman	04-Oct-89	WAI	<1		9.4	<1		1.2		2.3	
G.Huelsman	16-Nov-89	WAI	0.32	<0.01	7.1	0.17	<0.02	0.8	<0.01	1.4	<0.009
G.Huelsman	16-Nov-89	MPCA	1.2	<0.2	14	1.3	NQ	2.7	<0.2	3.3	<0.2
G.Huelsman	13-Dec-89	WAI	1.0	<0.01	9.6	0.73	<0.02	1.9	<0.01	2.3	<0.009
G.Huelsman	07-Feb-90	WAI									
G.Huelsman	30-May-90	WAI	0.22	<0.01	5.8	0.13	<0.02	0.52	<0.01	0.85	<0.009
G.Huelsman-1	04-Oct-89	WAI	<1		<1	<1		<1		<1	
G.Huelsman-1	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Huelsman-1	13-Dec-89	WAI	<0.01	<0.01	BPQL	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Huelsman-1	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Huelsman-2	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Huelsman-2	07-Feb-90	WAI									
R.Ramirez	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Ramirez	10-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
M.Nippoldt	10-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	0.51	0.34	<0.01	0.22	<0.009
M.Nippoldt	25-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	0.21	<0.01	BPQL	<0.009
M.Nippoldt	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	0.37	<0.01	0.25	<0.009
M.Nippoldt	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
M.Ritchie	04-Oct-89	WAI			4.0	<1				1	
M.Ritchie	16-Nov-89	WAI	<0.01	<0.01	3.4	0.11	<0.02	<0.01	<0.01	0.61	<0.009
M.Ritchie	16-Nov-89	MPCA	0.4	<0.2	5.9	1.6	NQ	0.8	<0.2	1.9	<0.2
M.Ritchie	13-Dec-89	WAI	0.27	<0.01	4.3	0.60	<0.02	0.64	<0.01	1.7	<0.009
M.Ritchie	30-May-90	WAI	<0.01	<0.01	3.1	0.11	<0.02	<0.01	<0.01	0.88	<0.009

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	1,2-Di chloro propane	Acetone	Methyl ethyl ketone	Methyl isobutyl ketone	Ethyl ether	Tetra hydro furan	Benzene	Toluene	Ethyl benzene
MDH RAL's	Nov-88		5.6	700	170	350		154	7	2420	680
36th & 37th Street											
C.Huppert	04-Oct-89	WAI									
C.Huppert	16-Nov-89	WAI	<0.01	3.7	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
C.Huppert	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
C.Huppert	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
C.Huppert	13-Dec-89	WAI	<0.01	<0.7	<0.2	<0.07	BPQL<1	0.83	<0.2	<0.3	<0.03
C.Huppert	04-May-90	WAI	<0.01	<0.7	<0.2	<0.07	BPQL<10	0.83	<0.2	<0.3	<0.03
J.Downs	04-Oct-89	WAI									
J.Downs	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
J.Downs	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
J.Downs	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
J.Downs	07-Feb-90	WAI									
J.Downs	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
J.Downs-1	04-Oct-89	WAI									
J.Downs-1	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	BPQL	BPQL
J.Downs-1	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
J.Downs-1	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
J.Downs-2	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
J.Downs-2	07-Feb-90	WAI									
F.Richert	16-Nov-89	WAI	<0.01	6.4	<0.2	<0.07	<0.1	<0.06	<0.02	BPQL	BPQL
F.Richert	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
F.Richert	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
F.Downs	04-Oct-89	WAI									
F.Downs	16-Nov-89	WAI	<0.01	6.5	<0.2	<0.07	BPQL	<0.06	0.21	BPQL	BPQL
F.Downs	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
F.Downs	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
F.Downs	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	1.4	<0.02	<0.03	<0.03
F.Downs	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
L.Richert	04-Oct-89	WAI									
L.Richert	16-Nov-89	WAI	<0.01	2.5	<0.2	<0.07	<0.1	<0.06	BPQL	0.32	<0.03
L.Richert	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
L.Richert	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
L.Richert	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
L.Richert	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
D.Klatke	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	BPQL	<0.03	BPQL
D.Klatke	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
D.Klatke	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Huelsman	04-Oct-89	WAI									
G.Huelsman	16-Nov-89	WAI	<0.01	7.2	<0.2	<0.07	<0.1	<0.06	BPQL	BPQL	<0.03
G.Huelsman	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
G.Huelsman	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Huelsman	07-Feb-90	WAI									
G.Huelsman	30-May-90	WAI	<0.01		<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
G.Huelsman-1	04-Oct-89	WAI									
G.Huelsman-1	16-Nov-89	WAI	<0.01	0.94	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Huelsman-1	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Huelsman-1	30-May-90	WAI	<0.01		<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
G.Huelsman-2	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Huelsman-2	07-Feb-90	WAI									
R.Ramirez	16-Nov-89	WAI	<0.01	2.3	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Ramirez	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
M.Nippoldt	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
M.Nippoldt	25-Jan-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
M.Nippoldt	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	BPQL	<0.06	<0.2	<0.3	<0.03
M.Nippoldt	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
M.Ritchie	04-Oct-89	WAI									
M.Ritchie	16-Nov-89	WAI	<0.01	22	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
M.Ritchie	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
M.Ritchie	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
M.Ritchie	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Xylenes	Total Phenols	Chloro benzene	Bis-2-ethyl hexyl phthalate	Diethyl phthalate	Di-n-butyl phthalate	Isophorone	Total coliform bacteria
MDH RAL's	Nov-88		400		300	40				
36th & 37th Street										
C.Huppert	04-Oct-89	WAI								
C.Huppert	16-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
C.Huppert	16-Nov-89	MPCA	<0.5		<0.5					
C.Huppert	13-Dec-89	WAI	<0.03		<0.02					
C.Huppert	13-Dec-89	WAI	<0.3		<0.2					
C.Huppert	04-May-90	WAI	<0.3		<0.2					
J.Downs	04-Oct-89	WAI								safe
J.Downs	16-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
J.Downs	16-Nov-89	MPCA	<0.5		<0.5					
J.Downs	13-Dec-89	WAI	<0.03		<0.02					
J.Downs	07-Feb-90	WAI								safe
J.Downs	30-May-90	WAI	<0.03		<0.2					
J.Downs-1	04-Oct-89	WAI								safe
J.Downs-1	16-Nov-89	WAI	0.36	<3	<0.02		<0.1		<0.12	
J.Downs-1	13-Dec-89	WAI	<0.03		<0.02					
J.Downs-1	30-May-90	WAI	<0.03		<0.2					
J.Downs-2	16-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
J.Downs-2	07-Feb-90	WAI								safe
F.Richert	16-Nov-89	WAI	BPQL	<3	<0.02		<0.1		<0.12	
F.Richert	16-Nov-89	MPCA	<0.5		<0.5					
F.Richert	10-Jan-90	WAI	<0.03		<0.02					
F.Downs	04-Oct-89	WAI								
F.Downs	16-Nov-89	WAI	0.62		<0.02		<0.1		<0.12	
F.Downs	16-Nov-89	MPCA	<0.5		<0.5					
F.Downs	13-Dec-89	WAI	<0.03	<0.3	<0.02					
F.Downs	10-Jan-90	WAI	<0.03		<0.02					
F.Downs	30-May-90	WAI	<0.03		<0.2					
L.Richert	04-Oct-89	WAI								
L.Richert	16-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
L.Richert	16-Nov-89	MPCA	<0.5		<0.5					
L.Richert	13-Dec-89	WAI	<0.03		<0.02					
L.Richert	10-Jan-90	WAI	<0.03		<0.02					
L.Richert	30-May-90	WAI	<0.03		<0.2					
D.Klatke	16-Nov-89	WAI	0.52	<3	<0.02		<0.1		<0.12	
D.Klatke	16-Nov-89	MPCA	<0.5		<0.5					
D.Klatke	10-Jan-90	WAI	<0.03		<0.02					
G.Huelsman	04-Oct-89	WAI								safe
G.Huelsman	16-Nov-89	WAI	0.33	<3	<0.02		<0.1		<0.12	
G.Huelsman	16-Nov-89	MPCA	<0.5		<0.5					
G.Huelsman	13-Dec-89	WAI	<0.03		<0.02					
G.Huelsman	07-Feb-90	WAI								safe
G.Huelsman	30-May-90	WAI	<0.03		<0.2					
G.Huelsman-1	04-Oct-89	WAI								safe
G.Huelsman-1	16-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
G.Huelsman-1	13-Dec-89	WAI	<0.03		<0.02					
G.Huelsman-1	30-May-90	WAI	<0.03		<0.2					
G.Huelsman-2	16-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
G.Huelsman-2	07-Feb-90	WAI								safe
R.Ramirez	16-Nov-89	WAI	<0.03	15	<0.02		<0.1		<0.12	
R.Ramirez	10-Jan-90	WAI	<0.03		<0.02					
M.Nippoldt	10-Jan-90	WAI	<0.03		<0.02					
M.Nippoldt	25-Jan-90	WAI	<0.03		<0.2					
M.Nippoldt	27-Feb-90	WAI	<0.03		<0.2					
M.Nippoldt	30-May-90	WAI	<0.03		<0.2					
M.Ritchie	04-Oct-89	WAI								
M.Ritchie	16-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
M.Ritchie	16-Nov-89	MPCA	<0.5		<0.5					
M.Ritchie	13-Dec-89	WAI	<0.03		<0.02					
M.Ritchie	30-May-90	WAI	<0.03		<0.2					

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Aqu	Dis	Chloro methane	Methylene chloride	Chloro form	Dichloro fluoro methane	Dichloro difluoro methane	Trichloro fluoro methane	Vinyl chloride	1,1-Di chloro ethylene
MDH RAL's	Nov-88					48	57		1400	2100	0.15	7
A.Christ	04-Oct-89	WAI	STP	1		<1		3.1	2.9	<1		
A.Christ	16-Nov-89	WAI	STP	1	<0.02	0.16	<0.008	<0.05	5.6	<0.02	<0.02	<0.01
A.Christ	16-Nov-89	MPCA	STP	1	NQ	1.0	0.6	PP	PP	0.7	NQ	0.4
A.Christ	13-Dec-89	WAI	STP	1	<0.02	0.41	<0.008	<0.05	11	<0.02	<0.02	0.41
A.Christ	07-Feb-90	WAI	STP	1								
A.Christ	30-May-90	WAI	STP	1	<0.02	<0.09	<0.008	4.2	3.8	<0.02	<0.02	<0.01
A.Christ	30-May-90	WAI	STP	1				Note: 1,1,1,2-Tetrachloroethane = BPQL<0.08 RAL = 2.0				
A.Christ-1	17-Nov-89	WAI	STP	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
A.Christ-1	13-Dec-89	WAI	STP	1	<0.02	BPQL	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
A.Christ-1	30-May-90	WAI	STP	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
A.Christ-2	07-Feb-90	WAI	STP	1								
G.Johnson	13-Dec-89	WAI	STP	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
M.Waldo	13-Dec-89	WAI	STP	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
J.Taylor	13-Dec-89	WAI	STP	1	<0.02	<0.009	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
J.Taylor	10-Jan-90	WAI	STP	1	<0.02	<0.009	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
J.Taylor	30-May-90	WAI	STP	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Strege	13-Dec-89	WAI	STP	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Quinn	04-Oct-89	WAI	PDC	1								
R.Quinn	16-Nov-89	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Quinn	16-Nov-89	MPCA	PDC	1	NQ	PP	<0.2	PP	PP	PP	NQ	<0.2
R.Quinn	16-Nov-89	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Quinn	16-Nov-89	MPCA	PDC	1	NQ	PP	<0.2	PP	PP	0.5	NQ	<0.2
R.Quinn	13-Dec-89	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	4.6	<0.02	<0.02	<0.01
R.Quinn	30-May-90	WAI	PDC	1	<0.02	<0.09	<0.008	<0.05	BPQL<2.0	<0.02	<0.02	<0.01
T.Jasicki	17-Nov-89	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
T.Jasicki	30-May-90	WAI	PDC	1	<0.02	<0.09	<0.008	<0.05	<0.5	<0.02	<0.02	<0.01
D.DuFresne	16-Nov-89	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.DuFresne	16-Nov-89	MPCA	PDC	1	NQ	<1	<0.2	PP	NQ	<0.5	NQ	<0.2
D.DuFresne	13-Dec-89	WAI	PDC	1								
D.DuFresne	10-Jan-90	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.DuFresne	06-Feb-90	WAI	PDC	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Maloney	13-Dec-89	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	2.4	<0.02	<0.02	<0.01
R.Maloney	10-Jan-90	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	2.1	<0.02	<0.02	<0.01
R.Maloney	30-May-90	WAI	PDC	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Winter	13-Dec-89	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Neby	13-Dec-89	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
D.Neby	10-Jan-90	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
D.Neby	30-May-90	WAI	PDC	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
T.Zilles	17-Nov-89	WAI	PDC	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
W.Richert	30-May-90	WAI	FRC	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
G.Paulson	16-Nov-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
G.Paulson	16-Nov-89	MPCA	UNK	1	NQ	<1	<0.2	PP	NQ	<0.5	NQ	<0.2
G.Paulson	10-Jan-90	WAI	UNK	1	→ 0.21	<0.009	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
G.Paulson	30-May-90	WAI	UNK	1	BPQL<0.2	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
T.O'Donnell	04-Oct-89	WAI	UNK	1								
T.O'Donnell	16-Nov-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
T.O'Donnell	16-Nov-89	MPCA	UNK	1	NQ	PP	<0.2	PP	PP	0.5	NQ	<0.2
T.O'Donnell	13-Dec-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	5.9	<0.02	<0.02	0.16
T.O'Donnell	10-Jan-90	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	4.3	<0.02	<0.02	<0.01
T.O'Donnell	30-May-90	WAI	UNK	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
J.Rondeau	04-Oct-89	WAI	UNK	1								
J.Rondeau	16-Nov-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
J.Rondeau	16-Nov-89	MPCA	UNK	1	NQ	<1	<0.2	PP	PP	PP	NQ	<0.2
J.Rondeau	13-Dec-89	WAI	UNK	1								
J.Rondeau	30-May-90	WAI	UNK	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Cis-1,2-dichloro ethylene	Trans-1,2-dichloro ethylene	Trichloro ethylene	Tetra chloro ethylene	Chloro ethane	1,1-Di chloro ethane	1,2-Di chloro ethane	1,1,1-Tri chloro ethane	1,1,2-Tri chloro ethane
MDH RAL's	Nov-88		70	70	31	6.6		810	3.8	200	14
A.Christ	04-Oct-89	WAI	<1		8.0	<1		1.4		<1	
A.Christ	16-Nov-89	WAI	0.33	<0.01	7.2	BPQL	<0.02	0.82	<0.01	0.79	<0.009
A.Christ	16-Nov-89	MPCA	1.1	<0.2	11	PP	NQ	2.6	<0.2	2.2	<0.2
A.Christ	13-Dec-89	WAI	1.3	<0.01	10	0.56	<0.02	2.3	<0.01	1.7	<0.009
A.Christ	07-Feb-90	WAI									
A.Christ	30-May-90	WAI	0.26	<0.01	5.0	<0.008	<0.02	0.52	<0.01	0.51	<0.009
A.Christ	30-May-90	WAI									
A.Christ-1	17-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
A.Christ-1	13-Dec-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
A.Christ-1	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
A.Christ-2	07-Feb-90	WAI									
G.Johnson	13-Dec-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
M.Waldo	13-Dec-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Taylor	13-Dec-89	WAI	0.15	<0.01	BPQL	<0.008	<0.02	0.14	<0.01	<0.02	<0.009
J.Taylor	10-Jan-90	WAI	0.11	<0.01	BPQL	<0.008	<0.02	0.12	<0.01	<0.02	<0.009
J.Taylor	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Strege	13-Dec-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Quinn	04-Oct-89	WAI			1.4					<1	
R.Quinn	16-Nov-89	WAI	<0.01	<0.01	0.98	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Quinn	16-Nov-89	MPCA	<0.2	<0.2	2.5	PP	NQ	0.8	<0.2	1.3	<0.2
R.Quinn	16-Nov-89	WAI	<0.01	<0.01	1.8	<0.008	<0.02	<0.01	<0.01	0.3	<0.009
R.Quinn	16-Nov-89	MPCA	0.6	<0.2	3.2	PP	NQ	1.0	<0.2	1.5	<0.2
R.Quinn	13-Dec-89	WAI	0.45	<0.01	2.9	0.13	<0.02	0.78	<0.01	0.44	<0.009
R.Quinn	30-May-90	WAI	BPQL<0.1	<0.01	1.9	<0.008	<0.02	0.18	<0.01	0.66	<0.009
T.Jasicki	17-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
T.Jasicki	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.DuFresne	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.DuFresne	16-Nov-89	MPCA	<0.2	<0.2	PP	<1	NQ	PP	<0.2	<0.2	<0.2
D.DuFresne	13-Dec-89	WAI									
D.DuFresne	10-Jan-90	WAI	<0.01	<0.01	BPQL	<0.008	<0.02	BPQL	<0.01	<0.02	<0.009
D.DuFresne	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Maloney	13-Dec-89	WAI	0.21	<0.01	BPQL	<0.008	<0.02	0.25	<0.01	<0.02	<0.009
R.Maloney	10-Jan-90	WAI	0.18	<0.01	BPQL	<0.008	<0.02	0.21	<0.01	<0.02	<0.009
R.Maloney	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Winter	13-Dec-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Neby	13-Dec-89	WAI	0.16	<0.01	BPQL	<0.008	<0.02	0.19	<0.01	<0.02	<0.009
D.Neby	10-Jan-90	WAI	0.17	<0.01	BPQL	<0.008	<0.02	0.20	<0.01	<0.02	<0.009
D.Neby	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
T.Zilles	17-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
W.Richert	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Paulson	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Paulson	16-Nov-89	MPCA	<0.2	<0.2	<0.2	<1	NQ	<0.2	<0.2	<0.2	<0.2
G.Paulson	10-Jan-90	WAI	<0.01	<0.01	BPQL	<0.008	<0.02	BPQL	<0.01	<0.02	<0.009
G.Paulson	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
T.O'Donnell	04-Oct-89	WAI			1.2					<1	
T.O'Donnell	16-Nov-89	WAI	<0.01	<0.01	0.48	0.21	<0.02	<0.01	<0.01	BPQL	<0.009
T.O'Donnell	16-Nov-89	MPCA	PP	<0.2	1.5	PP	NQ	0.4	<0.2	1.1	<0.2
T.O'Donnell	13-Dec-89	WAI	BPQL	<0.01	1.7	0.26	<0.02	0.25	<0.01	0.85	<0.009
T.O'Donnell	10-Jan-90	WAI	BPQL	<0.01	1.5	<0.008	<0.02	0.21	<0.01	0.70	<0.009
T.O'Donnell	30-May-90	WAI	<0.01	<0.01	BPQL<0.2	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Rondeau	04-Oct-89	WAI			<1					<1	
J.Rondeau	16-Nov-89	WAI	<0.01	<0.01	BPQL	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Rondeau	16-Nov-89	MPCA	<0.2	<0.2	0.6	<1	NQ	0.2	<0.2	0.5	<0.2
J.Rondeau	13-Dec-89	WAI									
J.Rondeau	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	1,2-Di chloro propane	Acetone	Methyl ethyl ketone	Methyl isobutyl ketone	Ethyl ether	Tetra hydro furan	Benzene	Toluene	Ethyl benzene
MDH RAL's	Nov-88		5.6	700	170	350		154	7	2420	680
A.Christ	04-Oct-89	WAI									
A.Christ	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
A.Christ	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
A.Christ	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
A.Christ	07-Feb-90	WAI									
A.Christ	30-May-90	WAI	<0.01	<2.0	BPQL<2.0	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
A.Christ	30-May-90	WAI									
A.Christ-1	17-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
A.Christ-1	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
A.Christ-1	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
A.Christ-2	07-Feb-90	WAI									
G.Johnson	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
M.Waldo	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
J.Taylor	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
J.Taylor	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
J.Taylor	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
R.Strege	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Quinn	04-Oct-89	WAI									
R.Quinn	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Quinn	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
R.Quinn	16-Nov-89	WAI	<0.01	2.7	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Quinn	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
R.Quinn	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Quinn	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
T.Jasicki	17-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
T.Jasicki	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
D.DuFresne	16-Nov-89	WAI	<0.01	1.3	<0.2	<0.07	<0.1	<0.06	0.26	BPQL	BPQL
D.DuFresne	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
D.DuFresne	13-Dec-89	WAI									
D.DuFresne	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.DuFresne	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Maloney	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Maloney	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Maloney	30-May-90	WAI	<0.01		<0.2	<0.07	<1.0	BPQL<0.6	<0.2	<0.3	<0.03
R.Winter	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.Neby	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.Neby	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.Neby	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
T.Zilles	17-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
W.Richert	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
G.Paulson	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	BPQL
G.Paulson	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
G.Paulson	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Paulson	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
T.O'Donnell	04-Oct-89	WAI									
T.O'Donnell	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	BPQL	BPQL	BPQL
T.O'Donnell	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
T.O'Donnell	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
T.O'Donnell	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
T.O'Donnell	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
J.Rondeau	04-Oct-89	WAI									
J.Rondeau	16-Nov-89	WAI	<0.01	0.83	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
J.Rondeau	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
J.Rondeau	13-Dec-89	WAI									
J.Rondeau	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Xylenes	Total Phenols	Chloro benzene	Bis-2-ethyl hexyl phthalate	Diethyl phthalate	Di-n-butyl phthalate	Isophorone	Total coliform bacteria
MDH RAL's	Nov-88		400		300	40				
A.Christ	04-Oct-89	WAI								
A.Christ	16-Nov-89	WAI	<0.03		<0.02		<0.1		<0.12	
A.Christ	16-Nov-89	MPCA	<0.5		<0.5					
A.Christ	13-Dec-89	WAI	<0.03	<0.3	<0.02					
A.Christ	07-Feb-90	WAI								safe
A.Christ	30-May-90	WAI	<0.03		<0.2					
A.Christ	30-May-90	WAI								
A.Christ-1	17-Nov-89	WAI	<0.03		<0.02					
A.Christ-1	13-Dec-89	WAI	<0.03	<0.3	<0.02					
A.Christ-1	30-May-90	WAI	<0.03		<0.2					
A.Christ-2	07-Feb-90	WAI								safe
G.Johnson	13-Dec-89	WAI	<0.03	<0.3	<0.02					
M.Waldo	13-Dec-89	WAI	<0.03	<0.3	<0.02					
J.Taylor	13-Dec-89	WAI	<0.03	<0.3	<0.02					
J.Taylor	10-Jan-90	WAI	<0.03		<0.02					
J.Taylor	30-May-90	WAI	<0.03		<0.2					
R.Strege	13-Dec-89	WAI	<0.03	<0.3	<0.02					
R.Quinn	04-Oct-89	WAI								
R.Quinn	16-Nov-89	WAI	<0.03		<0.02		<0.1		<0.12	
R.Quinn	16-Nov-89	MPCA	<0.5		<0.5					
R.Quinn	16-Nov-89	WAI	<0.03	3.5	<0.02		<0.1		<0.12	
R.Quinn	16-Nov-89	MPCA	<0.5		<0.5					
R.Quinn	13-Dec-89	WAI	<0.03		<0.02					
R.Quinn	30-May-90	WAI	<0.03		<0.2					
T.Jasicki	17-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
T.Jasicki	30-May-90	WAI	<0.3		<0.2					
D.DuFresne	16-Nov-89	WAI	0.62		<0.02		<0.1		<0.12	
D.DuFresne	16-Nov-89	MPCA	<0.5		<0.5					
D.DuFresne	13-Dec-89	WAI		<0.3						
D.DuFresne	10-Jan-90	WAI	<0.03		<0.02					
D.DuFresne	06-Feb-90	WAI	<0.03		<0.2					
R.Maloney	13-Dec-89	WAI	<0.03	<0.3	<0.02					
R.Maloney	10-Jan-90	WAI	<0.03		<0.02					
R.Maloney	30-May-90	WAI	<0.03		<0.2					
R.Winter	13-Dec-89	WAI	<0.03	<0.3	<0.02					
D.Neby	13-Dec-89	WAI	<0.03	<0.3	<0.02					
D.Neby	10-Jan-90	WAI	<0.03		<0.02					
D.Neby	30-May-90	WAI	<0.03		<0.2					
T.Zilles	17-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
W.Richert	30-May-90	WAI	<0.03		<0.2					
G.Paulson	16-Nov-89	WAI	0.41	<3	<0.02		<0.1		<0.12	
G.Paulson	16-Nov-89	MPCA	<0.5		<0.5					
G.Paulson	10-Jan-90	WAI	<0.03		<0.02					
G.Paulson	30-May-90	WAI	<0.03		<0.2					
T.O'Donnell	04-Oct-89	WAI								
T.O'Donnell	16-Nov-89	WAI	0.5		<0.02		<0.1		<0.12	
T.O'Donnell	16-Nov-89	MPCA	<0.5		<0.5					
T.O'Donnell	13-Dec-89	WAI	<0.03	<0.3	<0.02					
T.O'Donnell	10-Jan-90	WAI	<0.03		<0.02					
T.O'Donnell	30-May-90	WAI	<0.03		<0.2					
J.Rondeau	04-Oct-89	WAI								
J.Rondeau	16-Nov-89	WAI	<0.03		<0.02		<0.1		<0.12	
J.Rondeau	16-Nov-89	MPCA	<0.5		<0.5					
J.Rondeau	13-Dec-89	WAI		<0.3						
J.Rondeau	30-May-90	WAI	<0.03		<0.2					

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Aqu	Dis	Chloro methane	Methylene chloride	Chloro form	Dichloro fluoro methane	Dichloro difluoro methane	Trichloro fluoro methane	Vinyl chloride	1,1-Di chloro ethylene
MDH RAL's	Nov-88					48	57		1400	2100	0.15	7
L.Halverson	16-Nov-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
L.Halverson	16-Nov-89	MPCA	UNK	1	NQ	<1	<0.2	PP	PP	<0.5	NQ	<0.2
L.Halverson	13-Dec-89	WAI	UNK	1								
L.Halverson	10-Jan-90	WAI	UNK	1	0.27	<0.009	<0.008	<0.05	2.7	<0.02	<0.02	<0.01
L.Halverson	06-Feb-90	WAI	UNK	1	<0.02	<0.09	<0.008	<0.05	3.2	<0.02	<0.02	<0.01
L.Halverson	27-Feb-90	WAI	UNK	1	<0.02	<0.09	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
L.Halverson	30-May-90	WAI	UNK	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				1								<0.01
M.Hilyar	16-Nov-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
M.Hilyar	16-Nov-89	MPCA	UNK	1	NQ	<1	<0.2	PP	PP	<0.5	NQ	<0.2
M.Hilyar	30-May-90	WAI	UNK	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				1								
G.Neuenfeldt	16-Nov-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
G.Neuenfeldt	16-Nov-89	MPCA	UNK	1	NQ	<1	<0.2	NQ	NQ	<0.5	NQ	<0.2
				1								
T.Kormanik	16-Nov-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
T.Kormanik	16-Nov-89	MPCA	UNK	1	NQ	<1	<0.2	NQ	NQ	<0.5	NQ	<0.2
T.Kormanik	13-Dec-89	WAI	UNK	1								
T.Kormanik	10-Jan-90	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				1								
J.Ohrt	13-Dec-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				1								
R.Ehlers	13-Dec-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				1								
G.Williamson	13-Dec-89	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	3.1	<0.02	<0.02	<0.01
G.Williamson	10-Jan-90	WAI	UNK	1	<0.02	<0.009	<0.008	<0.05	2.1	<0.02	<0.02	<0.01
G.Williamson	30-May-90	WAI	UNK	1	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				1								
Jamaca Court				2								
L.Friedrich	27-Feb-90	WAI	SHA	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
D.Primoli	06-Feb-90	WAI	BAS	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Primoli	07-Mar-90	WAI	BAS	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
L.VanScyoc	06-Feb-90	WAI	PDC	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
L.VanScyoc	07-Mar-90	WAI	PDC	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
M.Woolford	06-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
D.Hruska	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
M.Hickey	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
M.Hickey	20-Mar-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
K.Adamson	06-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
K.Adamson	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
				2								
J.Bartel	06-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
P.Bloomquist	06-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
R.Domfeld	06-Feb-90	WAI	UNK	2	<0.02	<0.09	0.084	<0.05	<0.2	<0.02	<0.02	<0.01
R.Domfeld	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
B.Hall	06-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
B.Hall	27-Feb-90	WAI	UNK	2	<0.02	<0.09	0.12	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
S.Hauser	06-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
S.Hauser	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
E.Nielsen	06-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
Q.Phung	06-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
R.Sanders	06-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
R.Duke	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Duke	20-Mar-90	WAI	UNK	2	<0.02	<0.09	BPQL	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
D.Espelien	07-Mar-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Espelien	30-May-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
L.Freidrich	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
L.Freidrich	20-Mar-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								
R.Linell	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				2								

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Cis-1,2-dichloro ethylene	Trans-1,2-dichloro ethylene	Trichloro ethylene	Tetra chloro ethylene	Chloro ethane	1,1-Di chloro ethane	1,2-Di chloro ethane	1,1,1-Tri chloro ethane	1,1,2-Tri chloro ethane
MDH RAL's	Nov-88		70	70	31	6.6		810	3.8	200	14
L.Halverson	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
L.Halverson	16-Nov-89	MPCA	0.3	<0.2	PP	<1	NQ	0.2	<0.2	<0.2	<0.2
L.Halverson	13-Dec-89	WAI									
L.Halverson	10-Jan-90	WAI	0.18	<0.01	BPQL	<0.008	<0.02	0.20	<0.01	<0.02	<0.009
L.Halverson	06-Feb-90	WAI	BPQL	<0.01	BPQL	<0.008	<0.02	BPQL	<0.01	<0.02	<0.009
L.Halverson	27-Feb-90	WAI	0.23	<0.01	BPQL	<0.008	<0.02	0.28	<0.01	<0.02	<0.009
L.Halverson	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
M.Hilyar	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
M.Hilyar	16-Nov-89	MPCA	PP	<0.2	PP	<1	NQ	PP	<0.2	<0.2	<0.2
M.Hilyar	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Neuenfeldt	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Neuenfeldt	16-Nov-89	MPCA	<0.2	<0.2	<0.2	<1	NQ	<0.2	<0.2	<0.2	<0.2
T.Kormanik	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
T.Kormanik	16-Nov-89	MPCA	<0.2	<0.2	<0.2	<1	NQ	<0.2	<0.2	<0.2	<0.2
T.Kormanik	13-Dec-89	WAI									
T.Kormanik	10-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Ohrt	13-Dec-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Ehlers	13-Dec-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Williamson	13-Dec-89	WAI	0.23	<0.01	BPQL	<0.008	<0.02	0.26	<0.01	<0.02	<0.009
G.Williamson	10-Jan-90	WAI	0.17	<0.01	BPQL	<0.008	<0.02	0.21	<0.01	<0.02	<0.009
G.Williamson	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
Jamaca Court											
L.Friedrich	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Primoli	06-Feb-90	WAI	<0.01	<0.01	BPQL	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Primoli	07-Mar-90	WAI	<0.01	<0.01	BPQL	<0.008	<0.02	<0.01	<0.01	BPQL	<0.009
L.VanScyoc	06-Feb-90	WAI	<0.01	<0.01	BPQL	<0.008	<0.02	<0.01	<0.01	BPQL	<0.009
L.VanScyoc	07-Mar-90	WAI	<0.01	<0.01	BPQL	<0.008	<0.02	<0.01	<0.01	BPQL	<0.009
M.Woolford	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Hruska	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
M.Hickey	27-Feb-90	WAI	<0.01	<0.01	<0.02	0.10	<0.02	<0.01	<0.01	<0.02	<0.009
M.Hickey	20-Mar-90	WAI	<0.01	<0.01	<0.02	BPQL	<0.02	<0.01	<0.01	<0.02	<0.009
K.Adamson	06-Feb-90	WAI	<0.01	<0.01	<0.02	BPQL	<0.02	<0.01	<0.01	<0.02	<0.009
K.Adamson	27-Feb-90	WAI	<0.01	<0.01	<0.02	BPQL	<0.02	<0.01	<0.01	<0.02	<0.009
J.Bartel	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
P.Bloomquist	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Domfeld	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Domfeld	27-Feb-90	WAI	<0.01	<0.01	<0.02	0.20	<0.02	<0.01	<0.01	<0.02	<0.009
B.Hall	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	0.33	<0.009
B.Hall	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
S.Hauser	06-Feb-90	WAI	<0.01	<0.01	<0.02	BPQL	<0.02	<0.01	<0.01	<0.02	<0.009
S.Hauser	27-Feb-90	WAI	<0.01	<0.01	<0.02	0.16	<0.02	<0.01	<0.01	<0.02	<0.009
E.Nielsen	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
Q.Phung	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Sanders	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Duke	27-Feb-90	WAI	<0.01	<0.01	<0.02	0.11	<0.02	<0.01	<0.01	<0.02	<0.009
R.Duke	20-Mar-90	WAI	<0.01	<0.01	<0.02	BPQL	<0.02	<0.01	<0.01	<0.02	<0.009
D.Espelien	07-Mar-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Espelien	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
I.Freidrich	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
I.Freidrich	20-Mar-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Linell	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	1,2-Di chloro propane	Acetone	Methyl ethyl ketone	Methyl isobutyl ketone	Ethyl ether	Tetra hydro furan	Benzene	Toluene	Ethyl benzene
MDH RAL's	Nov-88		5.6	700	170	350		154	7	2420	680
L.Halverson	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
L.Halverson	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
L.Halverson	13-Dec-89	WAI									
L.Halverson	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
L.Halverson	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	BPQL	<0.2	<0.3	<0.03
L.Halverson	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	BPQL	BPQL	<0.2	<0.3	<0.03
L.Halverson	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
M.Hilyar	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
M.Hilyar	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
M.Hilyar	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
G.Neuenfeldt	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Neuenfeldt	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
T.Kormanik	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	BPQL	<0.03	BPQL
T.Kormanik	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
T.Kormanik	13-Dec-89	WAI									
T.Kormanik	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
J.Ohrt	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Ehlers	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Williamson	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Williamson	10-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
G.Williamson	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	BPQL<0.6	<0.2	<0.3	<0.03
Jamaca Court											
L.Friedrich	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Primoli	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Primoli	07-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
L.VanScyoc	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
L.VanScyoc	07-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
M.Woolford	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Hruska	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
M.Hickey	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
M.Hickey	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
K.Adamson	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	BPQL	<0.3	<0.03
K.Adamson	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	BPQL	<0.06	<0.2	<0.3	<0.03
J.Bartel	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
P.Bloomquist	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Domfeld	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Domfeld	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
B.Hall	06-Feb-90	WAI	<0.01	1.2	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
B.Hall	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
S.Hauser	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
S.Hauser	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
E.Nielsen	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
Q.Phung	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Sanders	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Duke	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Duke	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Espelien	07-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Espelien	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
L.Freidrich	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	BPQL	<0.06	<0.2	<0.3	<0.03
L.Freidrich	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Linell	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Xylenes	Total Phenols	Chloro benzene	Bis-2-ethyl hexyl phthalate	Diethyl phthalate	Di-n-butyl phthalate	Isophorone	Total coliform bacteria
MDH RAL's	Nov-88		400		300	40				
L.Halverson	16-Nov-89	WAI	BPQL		<0.02		<0.1		<0.12	
L.Halverson	16-Nov-89	MPCA	<0.5		<0.5					
L.Halverson	13-Dec-89	WAI		<0.3						
L.Halverson	10-Jan-90	WAI	<0.03		<0.02					
L.Halverson	06-Feb-90	WAI	<0.03		<0.2					
L.Halverson	27-Feb-90	WAI	<0.03		<0.2					
L.Halverson	30-May-90	WAI	<0.03		<0.2					
M.Hilyar	16-Nov-89	WAI	BPQL	<3	<0.02		<0.1		<0.12	
M.Hilyar	16-Nov-89	MPCA	<0.5		<0.5					
M.Hilyar	30-May-90	WAI	<0.03		<0.2					
G.Neuenfeldt	16-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
G.Neuenfeldt	16-Nov-89	MPCA	<0.5		<0.5					
T.Kormanik	16-Nov-89	WAI	0.44		<0.02		<0.1		<0.12	
T.Kormanik	16-Nov-89	MPCA	<0.5		<0.5					
T.Kormanik	13-Dec-89	WAI		<0.3						
T.Kormanik	10-Jan-90	WAI	<0.03		<0.02					
J.Ohrt	13-Dec-89	WAI	<0.03	<0.3	<0.02					
R.Ehlers	13-Dec-89	WAI	<0.03	<0.3	<0.02					
G.Williamson	13-Dec-89	WAI	<0.03	<0.3	<0.02					
G.Williamson	10-Jan-90	WAI	<0.03		<0.02					
G.Williamson	30-May-90	WAI	<0.03		<0.2					
Jamaca Court										
L.Friedrich	27-Feb-90	WAI	<0.03		<0.2					
D.Primoli	06-Feb-90	WAI	<0.03		<0.2					
D.Primoli	07-Mar-90	WAI	<0.03		<0.2					
L.VanScyoc	06-Feb-90	WAI	<0.03		<0.2					
L.VanScyoc	07-Mar-90	WAI	<0.03		<0.2					
M.Woolford	06-Feb-90	WAI	<0.03		<0.2					
D.Hruska	27-Feb-90	WAI	<0.03		<0.2					
M.Hickey	27-Feb-90	WAI	<0.03		<0.2					
M.Hickey	20-Mar-90	WAI	BPQL		<0.2					
K.Adamson	06-Feb-90	WAI	<0.03		<0.2					
K.Adamson	27-Feb-90	WAI	<0.03		<0.2					
J.Bartel	06-Feb-90	WAI	<0.03		<0.2					
P.Bloomquist	06-Feb-90	WAI	<0.03		<0.2					
R.Domfeld	06-Feb-90	WAI	<0.03		<0.2					
R.Domfeld	27-Feb-90	WAI	<0.03		<0.2					
B.Hall	06-Feb-90	WAI	<0.03		<0.2					
B.Hall	27-Feb-90	WAI	<0.03		<0.2					
S.Hauser	06-Feb-90	WAI	<0.03		<0.2					
S.Hauser	27-Feb-90	WAI	<0.03		<0.2					
E.Nielsen	06-Feb-90	WAI	<0.03		<0.2					
Q.Phung	06-Feb-90	WAI	<0.03		<0.2					
R.Sanders	06-Feb-90	WAI	<0.03		<0.2					
R.Duke	27-Feb-90	WAI	<0.03		<0.2					
R.Duke	20-Mar-90	WAI	<0.03		<0.2					
D.Espelien	07-Mar-90	WAI	BPQL		<0.2					
D.Espelien	30-May-90	WAI	<0.03		<0.2					
L.Freidrich	27-Feb-90	WAI	<0.03		<0.2					
L.Freidrich	20-Mar-90	WAI	<0.03		<0.2					
R.Linell	27-Feb-90	WAI	<0.03		<0.2					

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Aqu	Dis	Chloro methane	Methylene chloride	Chloro form	Dichloro fluoro methane	Dichloro difluoro methane	Trichloro fluoro methane	Vinyl chloride	1,1-Di chloro ethylene
MDH RAL's	Nov-88					48	57		1400	2100	0.15	7
R.Lofgren	27-Feb-90	WAI	UNK	2	<0.02	<0.09	0.31	<0.05	<0.2	<0.02	<0.02	<0.01
R.Lofgren	20-Mar-90	WAI	UNK	2	<0.02	<0.09	0.27	<0.05	<0.2	<0.02	<0.02	<0.01
J.Masterman	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
J.Masterman	20-Mar-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
J.Morris	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Price	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Price	20-Mar-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Prince	27-Feb-90	WAI	UNK	2	<0.02	<0.09	0.18	<0.05	<0.2	<0.02	<0.02	<0.01
D.Prince	20-Mar-90	WAI	UNK	2	<0.02	<0.09	0.14	<0.05	<0.2	<0.02	<0.02	<0.01
M.Reuvers	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Schoenecker	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Speltz	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
P.Weber	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
P.Weber	20-Mar-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
L.Weiss	07-Mar-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Yorga	27-Feb-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
D.Yorga	20-Mar-90	WAI	UNK	2	<0.02	<0.09	<0.008	<0.05	BPQL	<0.02	<0.02	<0.01
NW - Inside Well Advisory Area				3								
W.Ahola	16-Nov-89	WAI	BAS	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
W.Ahola	16-Nov-89	MPCA	BAS	3	NQ	<1	<0.2	NQ	NQ	<0.5	NQ	<0.2
M.Hansel	09-Jan-90	WAI	STP	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
N.Hickey	09-Jan-90	WAI	PDC	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Goss	16-Nov-89	WAI	PDC	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Goss	16-Nov-89	MPCA	PDC	3	NQ	<1	<0.2	NQ	NQ	<0.5	NQ	<0.2
R.Goss	09-Jan-90	WAI	PDC	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Goss	07-Feb-90	WAI	PDC	3								
S.Hansen	09-Jan-90	WAI	PDC	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Selbitshka	16-Nov-89	WAI	PDC	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Selbitshka	13-Dec-89	WAI	PDC	3								
K.Tomek	09-Jan-90	WAI	PDC	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
K.Tomek	07-Feb-90	WAI	PDC	3								
M.Thompson	09-Jan-90	WAI	PDC	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Dahlblom	16-Nov-89	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Dahlblom	16-Nov-89	MPCA	UNK	3	NQ	<1	<0.2	NQ	NQ	<0.5	NQ	<0.2
D.Dahlblom	16-Nov-89	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Dahlblom	16-Nov-89	MPCA	UNK	3	NQ	<1	<0.2	NQ	NQ	<0.5	NQ	<0.2
D.Dahlblom	13-Dec-89	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Dahlblom	09-Jan-90	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
R.Chin	09-Jan-90	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
W.Best	09-Jan-90	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Emerson	09-Jan-90	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Emerson	07-Feb-90	WAI	UNK	3								
R.Fuller	09-Jan-90	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
A.Grundhauser	09-Jan-90	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
A.Grundhauser	07-Feb-90	WAI	UNK	3								
C.Kiesling	09-Jan-90	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
D.Mogren	09-Jan-90	WAI	UNK	3	<0.02	<0.009	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Cis-1,2-dichloro ethylene	Trans-1,2-dichloro ethylene	Trichloro ethylene	Tetra chloro ethylene	Chloro ethane	1,1-Di chloro ethane	1,2-Di chloro ethane	1,1,1-Tri chloro ethane	1,1,2-Tri chloro ethane
MDH RAL's	Nov-88		70	70	31	6.6		810	3.8	200	14
R.Lofgren	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	0.17	<0.009
R.Lofgren	20-Mar-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	BPQL	<0.009
J.Masterman	27-Feb-90	WAI	<0.01	<0.01	<0.02	0.10	<0.02	<0.01	<0.01	<0.02	<0.009
J.Masterman	20-Mar-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
J.Morris	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Price	27-Feb-90	WAI	<0.01	<0.01	<0.02	0.12	<0.02	<0.01	<0.01	<0.02	<0.009
D.Price	20-Mar-90	WAI	<0.01	<0.01	<0.02	BPQL	<0.02	<0.01	<0.01	<0.02	<0.009
D.Prince	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Prince	20-Mar-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
M.Reuvers	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Schoenecker	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Speltz	27-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
P.Weber	27-Feb-90	WAI	<0.01	<0.01	<0.02	0.088	<0.02	<0.01	<0.01	<0.02	<0.009
P.Weber	20-Mar-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
L.Weiss	07-Mar-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Yorga	27-Feb-90	WAI	<0.01	<0.01	BPQL	BPQL	<0.02	<0.01	<0.01	<0.02	<0.009
D.Yorga	20-Mar-90	WAI	<0.01	<0.01	<0.02	BPQL	<0.02	<0.01	<0.01	<0.02	<0.009
NW - Inside Well Advisory Area											
W.Ahola	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
W.Ahola	16-Nov-89	MPCA	<0.2	<0.2	<0.2	<1	NQ	<0.2	<0.2	<0.2	<0.2
M.Hansel	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
N.Hickey	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Goss	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Goss	16-Nov-89	MPCA	<0.2	<0.2	<0.2	<1	NQ	<0.2	<0.2	<0.2	<0.2
R.Goss	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Goss	07-Feb-90	WAI									
S.Hansen	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Selbitshka	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Selbitshka	13-Dec-89	WAI									
K.Tomek	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
K.Tomek	07-Feb-90	WAI									
M.Thompson	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Dahlblom	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Dahlblom	16-Nov-89	MPCA	<0.2	<0.2	<0.2	<1	NQ	<0.2	<0.2	<0.2	<0.2
D.Dahlblom	16-Nov-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Dahlblom	16-Nov-89	MPCA	<0.2	<0.2	<0.2	<1	NQ	<0.2	<0.2	<0.2	<0.2
D.Dahlblom	13-Dec-89	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Dahlblom	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Chin	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
W.Best	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Emerson	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Emerson	07-Feb-90	WAI									
R.Fuller	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
A.Grundhauser	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
A.Grundhauser	07-Feb-90	WAI									
C.Kiesling	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Mogren	09-Jan-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	1,2-Di chloro propane	Acetone	Methyl ethyl ketone	Methyl isobutyl ketone	Ethyl ether	Tetra hydro furan	Benzene	Toluene	Ethyl benzene
MDH RAL's	Nov-88		5.6	700	170	350		154	7	2420	680
R.Lofgren	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Lofgren	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
J.Masterman	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
J.Masterman	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
J.Morris	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Price	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Price	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Prince	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Prince	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
M.Reuvers	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Schoenecker	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Speltz	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
P.Weber	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
P.Weber	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
L.Weiss	07-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Yorga	27-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	BPQL	<0.06	<0.2	<0.3	<0.03
D.Yorga	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	BPQL	<0.06	<0.2	<0.3	<0.03
NW - Inside Well Advisory Area											
W.Ahola	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
W.Ahola	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
M.Hansel	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
N.Hickey	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Goss	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	BPQL	BPQL
R.Goss	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
R.Goss	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Goss	07-Feb-90	WAI									
S.Hansen	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Selbitshka	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Selbitshka	13-Dec-89	WAI									
K.Tomek	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
K.Tomek	07-Feb-90	WAI									
M.Thompson	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.Dahlblom	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.Dahlblom	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
D.Dahlblom	16-Nov-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	1	BPQL	0.4
D.Dahlblom	16-Nov-89	MPCA	<0.2	<20	<10	<2	<1	<10	<0.5	<0.5	<0.5
D.Dahlblom	13-Dec-89	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.Dahlblom	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
R.Chin	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
W.Best	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.Emerson	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.Emerson	07-Feb-90	WAI									
R.Fuller	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
A.Grundhauser	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
A.Grundhauser	07-Feb-90	WAI									
C.Kiesling	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03
D.Mogren	09-Jan-90	WAI	<0.01	<0.07	<0.2	<0.07	<0.1	<0.06	<0.02	<0.03	<0.03

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Xylenes	Total Phenols	Chloro benzene	Bis-2-ethyl hexyl phthalate	Diethyl phthalate	Di-n-butyl phthalate	Isophorone	Total coliform bacteria
MDH RAL's	Nov-88		400		300	40				
R.Lofgren	27-Feb-90	WAI	<0.03		<0.2					
R.Lofgren	20-Mar-90	WAI	BPQL		<0.2					
J.Masterman	27-Feb-90	WAI	<0.03		<0.2					
J.Masterman	20-Mar-90	WAI	BPQL		<0.2					
J.Morris	27-Feb-90	WAI	<0.03		<0.2					
D.Price	27-Feb-90	WAI	<0.03		<0.2					
D.Price	20-Mar-90	WAI	<0.03		<0.2					
D.Prince	27-Feb-90	WAI	<0.03		<0.2					
D.Prince	20-Mar-90	WAI	<0.03		<0.2					
M.Reuvers	27-Feb-90	WAI	<0.03		<0.2					
R.Schoenecker	27-Feb-90	WAI	<0.03		<0.2					
R.Speltz	27-Feb-90	WAI	<0.03		<0.2					
P.Weber	27-Feb-90	WAI	<0.03		<0.2					
P.Weber	20-Mar-90	WAI	<0.03		<0.2					
L.Weiss	07-Mar-90	WAI	<0.03		<0.2					
D.Yorga	27-Feb-90	WAI	<0.03		<0.2					
D.Yorga	20-Mar-90	WAI	BPQL		<0.2					
NW - Inside Well Advisory Area										
W.Ahola	16-Nov-89	WAI	<0.03	<3	<0.02		<0.1		<0.12	
W.Ahola	16-Nov-89	MPCA	<0.5		<0.5					
M.Hansel	09-Jan-90	WAI	<0.03	<3	<0.02					
N.Hickey	09-Jan-90	WAI	<0.03	<3	<0.02					
R.Goss	16-Nov-89	WAI	BPQL	31.2	<0.02		<0.1		<0.12	
R.Goss	16-Nov-89	MPCA	<0.5		<0.5					
R.Goss	09-Jan-90	WAI	<0.03	6	<0.02					
R.Goss	07-Feb-90	WAI		BPQL						
S.Hansen	09-Jan-90	WAI	<0.03	<3	<0.02	4	<1	2	<1	
R.Selbitshka	16-Nov-89	WAI	<0.03		<0.02		<0.1		<0.12	
R.Selbitshka	13-Dec-89	WAI		<0.3						
K.Tomek	09-Jan-90	WAI	<0.03	4	<0.02					
K.Tomek	07-Feb-90	WAI		BPQL						
M.Thompson	09-Jan-90	WAI	<0.03	<3	<0.02					
D.Dahlblom	16-Nov-89	WAI	<0.03		<0.02		<0.1		<0.12	
D.Dahlblom	16-Nov-89	MPCA	<0.5		<0.5					
D.Dahlblom	16-Nov-89	WAI	1.2	<3	<0.02		<0.1		<0.12	
D.Dahlblom	16-Nov-89	MPCA	<0.5		<0.5					
D.Dahlblom	13-Dec-89	WAI	<0.03		<0.02					
D.Dahlblom	09-Jan-90	WAI	<0.03	<3	<0.02					
R.Chin	09-Jan-90	WAI	<0.03	<3	<0.02					
W.Best	09-Jan-90	WAI	<0.03	<3	<0.02					
D.Emerson	09-Jan-90	WAI	<0.03	4	<0.02					
D.Emerson	07-Feb-90	WAI		BPQL						
R.Fuller	09-Jan-90	WAI	<0.03	<3	<0.02					
A.Grundhauser	09-Jan-90	WAI	<0.03	7	<0.02					
A.Grundhauser	07-Feb-90	WAI		BPQL						
C.Kiesling	09-Jan-90	WAI	<0.03	<3	<0.02					
D.Mogren	09-Jan-90	WAI	<0.03	<3	<0.02					

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Aqu	Dis	Chloro methane	Methylene chloride	Chloro form	Dichloro fluoro methane	Dichloro difluoro methane	Trichloro fluoro methane	Vinyl chloride	1,1-Di chloro ethylene
MDH RAL's	Nov-88					48	57		1400	2100	0.15	7
NW - Outside Well Advisory Area				4								
J.Blackford	30-May-90	WAI	STP	4	<0.02	<0.09	<0.008	<0.05	BPQL<2.0	<0.02	<0.02	<0.01
				4								
G.Peterson	07-Feb-90	WAI	STP	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
G.Kitzman	07-Feb-90	WAI	STP	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
D.Loritz	07-Feb-90	WAI	STP	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
C.Hawkins	07-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
P.Pallmeyer	07-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
T.Bjork	06-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
R.Buska	07-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
E.Capra	07-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
M.Dahl	07-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
D.Olinger	01-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
T.Sandquist	07-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
T.Sandquist	07-Feb-90	WAI	UNK	4		Note: Cumene = BPQL (<0.4)						
T.Sandquist	20-Mar-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
T.Sandquist	30-May-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
P.Wandmacher	07-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								
W.Wegwerth	07-Feb-90	WAI	UNK	4	<0.02	<0.09	<0.008	<0.05	<0.2	<0.02	<0.02	<0.01
				4								

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Cis-1,2-dichloro ethylene	Trans-1,2-dichloro ethylene	Trichloro ethylene	Tetra chloro ethylene	Chloro ethane	1,1-Di chloro ethane	1,2-Di chloro ethane	1,1,1-Tri chloro ethane	1,1,2-Tri chloro ethane
MDH RAL's	Nov-88		70	70	31	6.6		810	3.8	200	14
NW - Outside Well Advisory Area											
J.Blackford	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Peterson	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
G.Kitzman	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Loritz	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
C.Hawkins	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
P.Pallmeyer	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
T.Bjork	06-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
R.Buska	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
E.Capra	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
M.Dahl	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
D.Olinger	01-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
T.Sandquist	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
T.Sandquist	07-Feb-90	WAI									
T.Sandquist	20-Mar-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
T.Sandquist	30-May-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
P.Wandmacher	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009
W.Wegwerth	07-Feb-90	WAI	<0.01	<0.01	<0.02	<0.008	<0.02	<0.01	<0.01	<0.02	<0.009

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	1,2-Di chloro propane	Acetone	Methyl ethyl ketone	Methyl isobutyl ketone	Ethyl ether	Tetra hydro furan	Benzene	Toluene	Ethyl benzene
MDH RAL's	Nov-88		5.6	700	170	350		154	7	2420	680
NW - Outside Well Advisory Area											
J.Blackford	30-May-90	WAI	<0.01	<2.0	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
G.Peterson	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
G.Kitzman	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Loritz	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
C.Hawkins	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
P.Pallmeyer	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
T.Bjork	06-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
R.Buska	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
E.Capra	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
M.Dahl	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
D.Olinger	01-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
T.Sandquist	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
T.Sandquist	07-Feb-90	WAI									
T.Sandquist	20-Mar-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
T.Sandquist	30-May-90	WAI	<0.01	15	<0.2	<0.07	<1.0	<0.06	<0.2	<0.3	<0.03
P.Wandmacher	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03
W.Wegwerth	07-Feb-90	WAI	<0.01	<0.7	<0.2	<0.07	<0.1	<0.06	<0.2	<0.3	<0.03

TABLE 2 WASHINGTON COUNTY SANITARY LANDFILL NO. 1 - RESIDENTIAL WATER QUALITY - ug/l

Well	Date	Mon. By	Xylenes	Total Phenols	Chloro benzene	Bis-2-ethyl hexyl phthalate	Diethyl phthalate	Di-n-butyl phthalate	Isophorone	Total coliform bacteria
MDH RAL's	Nov-88		400		300	40				
NW - Outside Well Advisory Area										
J.Blackford	30-May-90	WAI	<0.03		<0.2					
G.Peterson	07-Feb-90	WAI	<0.03		<0.2					
G.Kitzman	07-Feb-90	WAI	<0.03		<0.2					
D.Loritz	07-Feb-90	WAI	<0.03		<0.2					
C.Hawkins	07-Feb-90	WAI	<0.03		<0.2					
P.Pallmeyer	07-Feb-90	WAI	<0.03		<0.2					
T.Bjork	06-Feb-90	WAI	<0.03		<0.2					
R.Buska	07-Feb-90	WAI	<0.03		<0.2					
E.Capra	07-Feb-90	WAI	<0.03		<0.2					
M.Dahl	07-Feb-90	WAI	<0.03		<0.2					
D.Olinger	01-Feb-90	WAI	<0.03		<0.2					
T.Sandquist	07-Feb-90	WAI	<0.03		<0.2					
T.Sandquist	07-Feb-90	WAI								
T.Sandquist	20-Mar-90	WAI	BPQL		<0.2					
T.Sandquist	30-May-90	WAI	<0.03		<0.2					
P.Wandmacher	07-Feb-90	WAI	<0.03		<0.2					
W.Wegwerth	07-Feb-90	WAI	<0.03		<0.2					

TABLE 3

TOTAL LEAD ANALYSES

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

(Concentration, ug/L)

Well	Date	Mon. By	Aqu	Dis	Lead	Lead Notes
MDH RAL's	Nov-88				20	
Site Wells and Treatment Areas				0		
				0		
GC1	16-Nov-89	WAI	BAS	0	33	DIGESTED
GC1	13-Dec-89	WAI	BAS	0	42	
GC1	13-Dec-89	MPCA	BAS	0	13	
GC1	13-Feb-90	WAI	BAS	0	20	
GC1	20-Feb-90	WAI ARC	BAS	0	42	
GC1	20-Feb-90	WAI ARC	BAS	0	20	DIGESTED
GC1	20-Feb-90	WAI UHL	BAS	0	6	
GC1	20-Feb-90	WAI UHL	BAS	0	146	DIGESTED
GC1	28-Feb-90	WAI	BAS	0	80	DIGESTED, QUESTIONABLE DATA
GC1	28-Feb-90	WAI	BAS	0	87	QUESTIONABLE DATA
GC1	07-Mar-90	WAI	BAS	0	42	
GC1	07-Mar-90	WAI	BAS	0	24	DIGESTED
GC1	07-Mar-90	WAI	BAS	0	46	FILTERED
GC1	07-Mar-90	WAI	BAS	0	0.6	DIGESTED, FILTERED
GC1	24-Apr-90	WAI	BAS	0	<0.5	
GC1	24-Apr-90	MPCA	BAS	0	0.6	
GC1	24-Apr-90	WAI	BAS	0	<0.5	FILTERED
GC1	24-Apr-90	MPCA	BAS	0	<0.2	FILTERED
				0		
Hwy 5 Outlet	16-Nov-89	WAI		0	4.6	DIGESTED
Hwy 5 Outlet	13-Feb-90	WAI		0	<0.8	
Hwy 5 Outlet	20-Feb-90	WAI ARC		0	<0.8	
Hwy 5 Outlet	20-Feb-90	WAI ARC		0	12	DIGESTED
Hwy 5 Outlet	20-Feb-90	WAI UHL		0	3	
Hwy 5 Outlet	20-Feb-90	WAI UHL		0	2	DIGESTED
Hwy 5 Outlet	28-Feb-90	WAI		0	65	DIGESTED, QUESTIONABLE DATA
Hwy 5 Outlet	28-Feb-90	WAI		0	99	QUESTIONABLE DATA
Hwy 5 Outlet	07-Mar-90	WAI		0	37	
Hwy 5 Outlet	07-Mar-90	WAI		0	34	DIGESTED
Hwy 5 Outlet	07-Mar-90	WAI		0	25	FILTERED
Hwy 5 Outlet	07-Mar-90	WAI		0	50	DIGESTED, FILTERED
Hwy 5 Outlet	14-Mar-90	WAI UHL		0	<1	
Hwy 5 Outlet	14-Mar-90	WAI UHL		0	<1	DIGESTED
Hwy 5 Outlet	14-Mar-90	WAI UHL		0	<1	FILTERED
Hwy 5 Outlet	14-Mar-90	WAI UHL		0	<1	DIGESTED, FILTERED
Hwy 5 Outlet	05-Apr-90	WAI		0	<0.9	
Hwy 5 Outlet	05-Apr-90	WAI		0	<0.9	BROWN PLASTIC
Hwy 5 Outlet	12-Apr-90	WAI		0	<0.9	
Hwy 5 Outlet	24-Apr-90	WAI		0	<0.5	WHITE PLASTIC
				0		
TA1	24-Apr-90	WAI		0	<0.5	
TA1	24-Apr-90	MPCA		0	0.4	
TA1	24-Apr-90	WAI		0	<0.5	
TA1	24-Apr-90	MPCA		0	<0.2	FILTERED
				0		
EAGLE POINT LAKE	13-Feb-90	WAI		0	1.9	
				0		
36th & 37th Street				1		
				1		
C. HUPPERT	16-Nov-89	WAI	SHL	1	17	DIGESTED
C. HUPPERT	16-Nov-89	MPCA	SHL	1	1.4	
C. HUPPERT	13-Dec-89	WAI	SHL	1	1.3	
C. HUPPERT	13-Dec-89	MPCA	SHL	1	1	
				1		
J. DOWNS	16-Nov-89	WAI	BAS	1	4	DIGESTED
J. DOWNS	16-Nov-89	MPCA	BAS	1	2.2	
				1		
J. DOWNS T1	16-Nov-89	WAI	BAS	1	15	DIGESTED
				1		
J. DOWNS T2	16-Nov-89	WAI	BAS	1	5.7	DIGESTED
				1		
F. RICHERT	16-Nov-89	WAI	BAS	1	7.5	DIGESTED
F. RICHERT	16-Nov-89	MPCA	BAS	1	0.6	
				1		
W. AHOLA	16-Nov-89	WAI	BAS	1	1.3	DIGESTED
W. AHOLA	16-Nov-89	MPCA	BAS	1	0.4	
				1		
F. DOWNS	16-Nov-89	WAI	BAS	1	1.4	DIGESTED
F. DOWNS	16-Nov-89	MPCA	BAS	1	0.4	
				1		

TABLE 3

TOTAL LEAD ANALYSES

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

(Concentration, ug/L)

Well	Date	Mon. By	Aqu	Dis	Lead	Lead Notes
MDH RAL's	Nov-88				20	
L. RICHERT	16-Nov-89	WAI	BAS	1	8.1	DIGESTED
L. RICHERT	16-Nov-89	MPCA	BAS	1	2.8	
D. KLATKE	16-Nov-89	WAI	BAS	1	3.0	DIGESTED
D. KLATKE	16-Nov-89	MPCA	BAS	1	0.5	
G. HUELSMAN	16-Nov-89	WAI	BAS	1	8.1	DIGESTED
G. HUELSMAN	16-Nov-89	MPCA	BAS	1	2.4	
G. HUELSMAN T1	16-Nov-89	WAI	BAS	1	19	DIGESTED
G. HUELSMAN T2	16-Nov-89	WAI	BAS	1	3.8	DIGESTED
R. RAMIREZ	16-Nov-89	WAI	BAS	1	3.4	DIGESTED
R. RAMIREZ	13-Dec-89	MPCA	BAS	1	5.4	
M. RITCHIE	16-Nov-89	WAI	STP	1	1.3	DIGESTED
M. RITCHIE	16-Nov-89	MPCA	STP	1	0.6	
A. CHRIST	16-Nov-89	WAI	STP	1	17	DIGESTED
A. CHRIST	16-Nov-89	MPCA	STP	1	14	
A. CHRIST	13-Dec-89	WAI	STP	1	3.0	
G. JOHNSON	13-Dec-89	WAI	STP	1	<0.7	
G. JOHNSON	13-Dec-89	MPCA	STP	1	0.5	
M. WALDO	13-Dec-89	WAI	STP	1	<0.7	
M. WALDO	13-Dec-89	MPCA	STP	1	0.8	
J. TAYLOR	13-Dec-89	WAI	STP	1	<0.7	
J. TAYLOR	13-Dec-89	MPCA	STP	1	0.5	
R. STREGE	13-Dec-89	WAI	STP	1	<0.7	
R. STREGE	13-Dec-89	MPCA	STP	1	0.6	
R. QUINN	16-Nov-89	WAI	PDC	1	4.7	DIGESTED, 5 MIN.
R. QUINN	16-Nov-89	MPCA	PDC	1	0.8	5 MIN.
R. QUINN	16-Nov-89	WAI	PDC	1	13	DIGESTED, 15 MIN.
R. QUINN	16-Nov-89	MPCA	PDC	1	1.2	15 MIN.
R. QUINN	13-Dec-89	WAI	PDC	1	1.0	
R. QUINN	13-Dec-89	MPCA	PDC	1	1.1	
T. JASICKI	17-Nov-89	WAI	PDC	1	10.2	DIGESTED
T. JASICKI	13-Dec-89	WAI	PDC	1	10	
T. JASICKI	13-Dec-89	MPCA	PDC	1	7.2	
D. DU FRESNE	16-Nov-89	WAI	PDC	1	78	DIGESTED
D. DU FRESNE	16-Nov-89	MPCA	PDC	1	<0.2	
D. DU FRESNE	13-Dec-89	WAI	PDC	1	3.4	
D. DU FRESNE	13-Dec-89	MPCA	PDC	1	0.2	
R. MALONEY	13-Dec-89	WAI	PDC	1	<0.7	
R. MALONEY	13-Dec-89	MPCA	PDC	1	0.3	
R. WINTER	13-Dec-89	WAI	PDC	1	<0.7	
R. WINTER	13-Dec-89	MPCA	PDC	1	0.2	
D. NEBY	13-Dec-89	WAI	PDC	1	<0.7	
D. NEBY	13-Dec-89	MPCA	PDC	1	0.3	
T. ZILLES	16-Nov-89	WAI	PDC	1	5.9	DIGESTED
G. PAULSON	16-Nov-89	WAI	UNK	1	26	DIGESTED
G. PAULSON	16-Nov-89	MPCA	UNK	1	0.3	
G. PAULSON	13-Dec-89	WAI	UNK	1	<0.3	
G. PAULSON	13-Dec-89	MPCA	UNK	1	0.5	
T. O'DONNELL	16-Nov-89	WAI	UNK	1	7.8	DIGESTED
T. O'DONNELL	16-Nov-89	MPCA	UNK	1	4.1	
J. RONDEAU	16-Nov-89	WAI	UNK	1	3.9	DIGESTED
J. RONDEAU	16-Nov-89	MPCA	UNK	1	1.7	

TABLE 3

TOTAL LEAD ANALYSES

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

(Concentration, ug/L)

Well	Date	Mon. By	Aqu	Dis	Lead	Lead Notes
MDH RAL's	Nov-88				20	
				1		
L. HALVERSON	16-Nov-89	WAI	UNK	1	5.9	DIGESTED
L. HALVERSON	16-Nov-89	MPCA	UNK	1	0.2	
				1		
M. HILYAR	16-Nov-89	WAI	UNK	1	6.6	DIGESTED
M. HILYAR	16-Nov-89	MPCA	UNK	1	0.3	
				1		
G. NEUENFELDT	16-Nov-89	WAI	UNK	1	4.1	DIGESTED
G. NEUENFELDT	16-Nov-89	MPCA	UNK	1	0.7	
				1		
T. KORMANIK	16-Nov-89	WAI	UNK	1	4.7	DIGESTED
T. KORMANIK	16-Nov-89	MPCA	UNK	1	0.5	
				1		
J. OHRT	13-Dec-89	WAI	UNK	1	<0.7	
J. OHRT	13-Dec-89	MPCA	UNK	1	0.6	
				1		
R. EHLERS	13-Dec-89	WAI	UNK	1	<0.7	
R. EHLERS	13-Dec-89	MPCA	UNK	1	0.4	
				1		
G. WILLIAMSON	13-Dec-89	WAI	UNK	1	<0.7	
G. WILLIAMSON	13-Dec-89	MPCA	UNK	1	0.7	
				1		
Jamaca Court				2		
				2		
L. FREIDRICH	27-Feb-90	WAI	SHL	2	108	QUESTIONABLE DATA
L. FREIDRICH	20-Mar-90	WAI	SHL	2	2.5	
L. FREIDRICH	03-May-90	WASH	SHL	2	1.2	
				2		
D. PRIMOLI	06-Feb-90	WAI	BAS	2	1.5	
				2		
L. VAN SCYOC	06-Feb-90	WAI	PDC	2	<0.8	
				2		
M. WOLLFORD	06-Feb-90	WAI	UNK	2	<0.8	
				2		
D. HRUSKA	27-Feb-90	WAI	UNK	2	126	QUESTIONABLE DATA
D. HRUSKA	20-Mar-90	WAI	UNK	2	5.6	
D. HRUSKA	03-May-90	WASH	UNK	2	1.1	
				2		
M. HICKEY	27-Feb-90	WAI	UNK	2	79	QUESTIONABLE DATA
M. HICKEY	20-Mar-90	WAI	UNK	2	140	QUESTIONABLE DATA
M. HICKEY	03-May-90	WASH	UNK	2	<1.0	
M. HICKEY	03-May-90	MDH	UNK	2	<5	
				2		
K. ADAMSON	06-Feb-90	WAI	UNK	2	<0.8	QUESTIONABLE DATA
K. ADAMSON	27-Feb-90	WAI	UNK	2	126	QUESTIONABLE DATA
K. ADAMSON	03-May-90	WASH	UNK	2	3.0	
				2		
J. BARTEL	06-Feb-90	WAI	UNK	2	7.5	
				2		
P. BLOOMQUIST	06-Feb-90	WAI	UNK	2	1.9	
				2		
R. DORNFELD	06-Feb-90	WAI	UNK	2	200	QUESTIONABLE DATA
R. DORNFELD	27-Feb-90	WAI	UNK	2	3.1	QUESTIONABLE DATA
R. DORNFELD	03-May-90	WASH	UNK	2	<1.0	
				2		
B. HALL	06-Feb-90	WAI	UNK	2	<0.8	QUESTIONABLE DATA
B. HALL	27-Feb-90	WAI	UNK	2	128	QUESTIONABLE DATA
B. HALL	04-May-90	WASH	UNK	2	<1.0	
				2		
S. HAUSER	06-Feb-90	WAI	UNK	2	<0.8	QUESTIONABLE DATA
S. HAUSER	27-Feb-90	WAI	UNK	2	108	QUESTIONABLE DATA
S. HAUSER	03-May-90	WASH	UNK	2	<1.0	
				2		
E. NIELSON	06-Feb-90	WAI	UNK	2	810	QUESTIONABLE DATA
E. NIELSON	27-Feb-90	WAI	UNK	2	280	QUESTIONABLE DATA
E. NIELSON	04-May-90	WASH	UNK	2	<1.0	
E. NIELSON	04-May-90	MDH	UNK	2	<5	
				2		
Q. PHUNG	06-Feb-90	WAI	UNK	2	1.1	
				2		
R. SANDERS	06-Feb-90	WAI	UNK	2	6.8	
				2		

TABLE 3

TOTAL LEAD ANALYSES

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

(Concentration, ug/L)

Well	Date	Mon. By	Aqu	Dis	Lead	Lead Notes
MDH RAL's	Nov-88				20	
R. DUKE	27-Feb-90	WAI	UNK	2	102	QUESTIONABLE DATA
R. DUKE	20-Mar-90	WAI	UNK	2	7.4	
R. DUKE	20-Mar-90	WAI	UNK	2	5.7	BLIND DUP
R. DUKE	05-May-90	WASH	UNK	2	<1.0	
D. ESPELIEN	07-Mar-90	WAI	UNK	2	49	QUESTIONABLE DATA
D. ESPELIEN	04-May-90	WASH	UNK	2	1.0	
I. FREIDRICH	27-Feb-90	WAI	UNK	2	118	QUESTIONABLE DATA
I. FREIDRICH	20-Mar-90	WAI	UNK	2	2.4	
I. FREIDRICH	04-May-90	WASH	UNK	2	<1.0	
R. LINELL	27-Feb-90	WAI	UNK	2	229	QUESTIONABLE DATA
R. LINELL	20-Mar-90	WAI	UNK	2	<0.7	
R. LINELL	20-Mar-90	WAI MDH	UNK	2	<5	
R. LINELL	03-May-90	WASH	UNK	2	1.1	
R. LOFGREN	27-Feb-90	WAI	UNK	2	116	QUESTIONABLE DATA
R. LOFGREN	20-Mar-90	WAI	UNK	2	2.6	
R. LOFGREN	20-Mar-90	WAI MDH	UNK	2	<5	
R. LOFGREN	04-May-90	WASH	UNK	2	9.2	
R. LOFGREN	30-May-90	WASH	UNK	2	<2	
J. MASTERMAN	27-Feb-90	WAI	UNK	2	131	QUESTIONABLE DATA
J. MASTERMAN	20-Mar-90	WAI	UNK	2	128	QUESTIONABLE DATA
J. MASTERMAN	20-Mar-90	WAI MDH	UNK	2	<5	
J. MASTERMAN	04-May-90	WASH	UNK	2	<1.0	
J. MASTERMAN	04-May-90	MDH	UNK	2	<5	
J. MORRIS	27-Feb-90	WAI	UNK	2	73	QUESTIONABLE DATA
J. MORRIS	20-Mar-90	WAI	UNK	2	3.7	
J. MORRIS	03-May-90	WASH	UNK	2	<1.0	
D. PRICE	27-Feb-90	WAI	UNK	2	112	QUESTIONABLE DATA
D. PRICE	20-Mar-90	WAI	UNK	2	5.4	
D. PRICE	20-Mar-90	WAI MDH	UNK	2	<5	
D. PRICE	03-May-90	WASH	UNK	2	<1.0	
D. PRINCE	27-Feb-90	WAI	UNK	2	97	QUESTIONABLE DATA
D. PRINCE	20-Mar-90	WAI	UNK	2	170	QUESTIONABLE DATA
D. PRINCE	04-May-90	WASH	UNK	2	<1.0	
D. PRINCE	04-May-90	MDH	UNK	2	<5	
M. REUVERS	27-Feb-90	WAI	UNK	2	125	QUESTIONABLE DATA
M. REUVERS	20-Mar-90	WAI	UNK	2	8.7	
M. REUVERS	20-Mar-90	WAI MDH	UNK	2	<5	
M. REUVERS	05-May-90	WASH	UNK	2	<1.0	
R. SCHOENECKER	27-Feb-90	WAI	UNK	2	91	QUESTIONABLE DATA
R. SCHOENECKER	20-Mar-90	WAI	UNK	2	2.5	
R. SCHOENECKER	07-May-90	WASH	UNK	2	<1.0	
R. SPELTZ	27-Feb-90	WAI	UNK	2	1.3	
P. WEBER	27-Feb-90	WAI	UNK	2	92	QUESTIONABLE DATA
P. WEBER	20-Mar-90	WAI	UNK	2	2.8	
P. WEBER	04-May-90	WASH	UNK	2	1.8	
L. WEISS	07-Mar-90	WAI	UNK	2	61	QUESTIONABLE DATA
L. WEISS	03-May-90	WASH	UNK	2	<1.0	
L. WEISS	03-May-90	MDH	UNK	2	<5	
D. YORGA	27-Feb-90	WAI	UNK	2	72	QUESTIONABLE DATA
D. YORGA	20-Mar-90	WAI	UNK	2	130	QUESTIONABLE DATA
D. YORGA	03-May-90	WASH	UNK	2	<1.0	
D. YORGA	03-May-90	MDH	UNK	2	<5	
NW - Inside Well Advisory Area				3		
M. HANSEL	09-Jan-90	WAI	STP	3	1.7	
N. HICKEY	09-Jan-90	WAI	PDC	3	<0.3	

TABLE 3

TOTAL LEAD ANALYSES

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

(Concentration, ug/L)

Well	Date	Mon. By	Aqu	Dis	Lead	Lead Notes
MDH RAL's	Nov-88				20	
				3		
R. GOSS	16-Nov-89	WAI	PDC	3	9.4	DIGESTED
R. GOSS	16-Nov-89	MPCA	PDC	3	1.6	
R. GOSS	09-Jan-90	WAI	PDC	3	33	
R. GOSS	07-Feb-90	WAI	PDC	3	86	0 MIN.
R. GOSS	07-Feb-90	WAI	PDC	3	300	5 MIN.
R. GOSS	07-Feb-90	WAI	PDC	3	24	15 MIN.
R. GOSS	03-May-90	WASH	PDC	3	<1.0	
R. GOSS	03-May-90	MDH	PDC	3	<5	
				3		
S. HANSEN	09-Jan-90	WAI	PDC	3	<0.3	
				3		
R. SELBITSHKA	16-Nov-89	WAI	PDC	3	3.0	DIGESTED
				3		
K. TOMEK	09-Jan-90	WAI	PDC	3	12	
K. TOMEK	07-Feb-90	WAI	PDC	3	130	0 MIN.
K. TOMEK	07-Feb-90	WAI	PDC	3	24	5 MIN.
K. TOMEK	07-Feb-90	WAI	PDC	3	1.2	15 MIN.
K. TOMEK	04-May-90	WASH	PDC	3	<1.0	
				3		
M. THOMPSON	09-Jan-90	WAI	PDC	3	37	
M. THOMPSON	07-Feb-90	WAI	PDC	3	2.6	
M. THOMPSON	05-May-90	WASH	PDC	3	<1.0	
				3		
D. DAHLBLOM	16-Nov-89	WAI	UNK	3	2.5	DIGESTED, 5 MIN.
D. DAHLBLOM	16-Nov-89	MPCA	UNK	3	0.3	5 MIN.
D. DAHLBLOM	16-Nov-89	WAI	UNK	3	6.5	DIGESTED, 15 MIN.
D. DAHLBLOM	16-Nov-89	MPCA	UNK	3	0.4	15 MIN.
D. DAHLBLOM	09-Jan-90	WAI	UNK	3	<0.3	
				3		
R. CHIN	09-Jan-90	WAI	UNK	3	1.7	
				3		
W. BEST	09-Jan-90	WAI	UNK	3	1.4	
				3		
D. EMERSON	09-Jan-90	WAI	UNK	3	25	QUESTIONABLE DATA
D. EMERSON	07-Feb-90	WAI	UNK	3	410	QUESTIONABLE DATA
D. EMERSON	03-May-90	WASH	UNK	3	<1.0	
D. EMERSON	03-May-90	MDH	UNK	3	<5	
				3		
R. FULLER	09-Jan-90	WAI	UNK	3	<0.3	
				3		
A. GRUNDHAUER	09-Jan-90	WAI	UNK	3	<0.3	
				3		
C. KIESLING	09-Jan-90	WAI	UNK	3	<0.3	
				3		
D. MOGREN	09-Jan-90	WAI	UNK	3	<0.3	
				3		
NW - Outside Well Advisory Area				4		
				4		
G. PETERSON	07-Feb-90	WAI	STP	4	1.0	
				4		
G. KITZMAN	07-Feb-90	WAI	STP	4	3.4	
				4		
D. LORITZ	07-Feb-90	WAI	STP	4	160	QUESTIONABLE DATA
D. LORITZ	20-Mar-90	WAI	STP	4	51	QUESTIONABLE DATA
D. LORITZ	03-May-90	WASH	STP	4	24.2	
D. LORITZ	03-May-90	MDH	STP	4	<5	
D. LORITZ	30-May-90	WASH	STP	4	<2	
				4		
P. PALLMEYER	07-Feb-90	WAI	UNK	4	<0.8	
				4		
T. BJORK	06-Feb-90	WAI	UNK	4	45	QUESTIONABLE DATA
T. BJORK	20-Mar-90	WAI ARC	UNK	4	3700	QUESTIONABLE DATA
T. BJORK	20-Mar-90	WAI ARC	UNK	4	110	BLIND DUP, QUESTIONABLE DATA
T. BJORK	03-May-90	WASH	UNK	4	1.5	
T. BJORK	03-May-90	MDH	UNK	4	<5	
				4		
R. BUSKA	07-Feb-90	WAI	UNK	4	1.5	
				4		
E. CAPRA	07-Feb-90	WAI	UNK	4	8.8	
				4		
M. DAHL	07-Feb-90	WAI	UNK	4	<0.8	

TABLE 3

TOTAL LEAD ANALYSES

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

(Concentration, ug/L)

Well	Date	Mon. By	Aqu	Dis	Lead	Lead Notes
MDH RAL's	Nov-88				20	
C. HAWKINS	07-Feb-90	WAI	UNK	4	45	QUESTIONABLE DATA
C. HAWKINS	20-Mar-90	WAI	UNK	4	4.9	
C. HAWKINS	04-May-90	WASH	UNK	4	<1.0	
D. OLINGER	01-Feb-90	WAI	UNK	4	6.0	
T. SANDQUIST	07-Feb-90	WAI	UNK	4	35	QUESTIONABLE DATA
T. SANDQUIST	20-Mar-90	WAI	UNK	4	4.6	
T. SANDQUIST	03-May-90	WASH	UNK	4	<1.0	
P. WANDMACHER	07-Feb-90	WAI	UNK	4	<0.8	
W. WEGWERTH	07-Feb-90	WAI	UNK	4	3.4	

TABLE 4

ANNUAL COST ESTIMATE

ALTERNATIVE A: NO ACTION

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Item	Sites	Frequency #/yr	Amount	Unit	Unit Cost	Annual Cost	MPCA Cost
GROUNDWATER MONITORING							
Quarterly Sampling VOC's	31	4	124	Ea	$180	$22,320	
Sample Collection, Data Review & Reporting		4	248	Hr	$60	$14,880	
Semi-Annual Sampling VOC's	50	2	100	Ea	$180	$18,000	
Sample Collection, Data Review & Reporting		2	200	Hr	$60	$12,000	
ANNUAL COST						$67,200	$67,200
OPTION 1 PRESENT VALUE							$572,06
GRANULAR ACTIVATED CARBON FILTERS							
VOCs Coliform Bacteria Coord, Reporting Supplies					$180 $20 $120 $50		
	3	4	12	Ea	$370	$4,440	
Carbon replacement	3	1	3	Ea	$550	$1,650	
						$6,090	
BOTTLED WATER	7	12	84	Month	$170	$14,280	
ANNUAL COST						$87,600	
OPTION 2 PRESENT VALUE						$746,000	

Note: Present value cost is based on a 10% discount rate and a 20 year project life.
Option 1 includes only groundwater monitoring.
Option 2 includes groundwater monitoring, GACs and bottled water.

TABLE 5

CAPITAL COST ESTIMATE

ALTERNATIVE B: GRANULAR ACTIVATED CARBON FILTERS

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Item	Sites	Unit	Unit Cost	Cost	MPCA Sites	MPCA Cost
GRANULAR ACTIVATED CARBON FILTERS						
Tanks	28	Ea	$1,825	$51,100	7	$12,775
Carbon	28	Ea	$225	$6,300	7	$1,575
Installation	28	Ea	$775	$21,700	7	$5,425
Coordination	40	Hr	$76	$3,040	10	$760
Design	40	Hr	$53	$2,120	10	$530
Expenses	1		$600	$600		$140
Field Inspection	28	Ea	$212	$5,936	10	$2,120
CAPITAL COST				$91,000		$23,000

Note: Three GAC filters are currently operating. Total of 31 filters would be operated.

TABLE 6

ANNUAL COST ESTIMATE

ALTERNATIVE B: GRANULAR ACTIVATED CARBON FILTERS

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Item	Sites	Frequency #/yr	Amount	Unit	Unit Cost	Annual Cost	MPCA Cost
GROUNDWATER MONITORING							
Quarterly Sampling VOC's	10	4	40	Ea	$180	$7,200	
Sample Collection, Data Review & Reporting		4	80	Hr	$60	$4,800	
Semi-Annual Sampling VOC's	71	2	142	Ea	$180	$25,560	
Sample Collection, Data Review & Reporting		2	284	Hr	$60	$17,040	
						$54,600	$54,600
GRANULAR ACTIVATED CARBON FILTERS							
VOCs Coliform Bacteria Coord, Reporting Supplies					$180 $20 $120 $50		
	10	4	40	Ea	$370	$14,800	$14,800
VOCs, semi-annual($180/2) Coliform Bacteria Coord, Reporting Supplies					$90 $20 $120 $50		
	21	4	84	Ea	$280	$23,520	
Carbon replacement	31	1	31	Ea	$550	$17,050	$5,167
						$55,370	$19,967
ANNUAL COST						$110,000	$74,600
CAPITAL COST (TABLE 5)						$91,000	$23,000
PRESENT VALUE						$1,027,000	$658,000

Note: Present value cost is based on a 10% disccunt rate and a 20 year project life.

TABLE 7

CAPITAL COST ESTIMATE

ALTERNATIVE C: NEW RESIDENTIAL WELLS

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Item	Sites	Unit	Unit Cost	Cost	MPCA Sites	MPCA Cost
NEW WELLS						
Installation	31	Ea	$21,000	$651,000	10	$210,000
Abandonment	31	Ea	$500	$15,500	10	$5,000
Coordination	80	Hr	$76	$6,080	25	$1,900
Design	80	Hr	$53	$4,240	25	$1,325
Expenses	1		$1,650	$1,650		$516
VOC's	31	Ea	$180	$5,580	10	$1,800
Field Inspection	31	Ea	$848	$26,288	10	$8,480
SUBTOTAL				$710,000		$229,000
CONTINGENCIES				$71,000		$22,900
CAPITAL COST				$781,000		$252,000

Note: Total of 31 new wells would be installed.

TABLE 8

ANNUAL COST ESTIMATE

ALTERNATIVE C: NEW RESIDENTIAL WELLS

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Item	Sites	Frequency #/yr	Amount	Unit	Unit Cost	Annual Cost	MPCA Cost
GROUNDWATER MONITORING							
Semi-Annual Sampling VOC's	50	2	100	Ea	$180	$18,000	
Sample Collection, Data Review & Reporting		2	200	Hr	$60	$12,000	
Annual Sampling VOC's	31	1	31	Ea	$180	$5,580	
Sample Collection, Data Review & Reporting		1	62	Hr	$60	$3,720	
						$39,300	
ANNUAL COST						$39,300	$39,300
CAPITAL COST (TABLE 7)						$781,000	$252,000
PRESENT VALUE						$1,116,000	$587,000

Note:- Homeowner retains responsibility for power cost, tank, pump and well maintenance and future replacement.

Present value cost is based on a 10% discount rate and a 20 year project life.

TABLE 9

CAPITAL COST ESTIMATE

ALTERNATIVE D: RESIDENTIAL CLUSTER WELLS

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Item	Sites	Unit	Unit Cost	Cost	MPCA Sites	MPCA Cost
NEW WELLS						
Installation	7	Ea	$28,000	$196,000	2	$56,000
Installation	1	Ea	$21,000	$21,000	1	$21,000
Pipe	6400	Ft	$12	$76,800	1900	$22,800
Abandonment	31	Ea	$500	$15,500	10	$5,000
Coordination	40	Hr	$76	$3,040	15	$1,140
Design	40	Hr	$53	$2,120	15	$795
Expenses	1		$600	$600		$225
VOC's	8	Ea	$180	$1,440	3	$540
Field Inspection	8	Ea	$1,272	$10,176	3	$3,816
SUBTOTAL				$327,000		$111,000
CONTINGENCIES				$32,700		$11,100
CAPITAL COST				$360,000		$122,000

Note: Total of 31 residential wells would be replaced.

TABLE 10

ANNUAL COST ESTIMATE

ALTERNATIVE D: RESIDENTIAL CLUSTER WELLS

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Item	Sites	Frequency #/yr	Amount	Unit	Unit Cost	Annual Cost	MPCA Cost
GROUNDWATER MONITORING							
Semi-Annual Sampling VOC's	50	2	100	Ea	$180	$18,000	
Sample Collection, Data Review & Reporting		2	200	Hr	$60	$12,000	
Annual Sampling VOC's	8	1	8	Ea	$180	$1,440	
Sample Collection, Data Review & Reporting		1	16	Hr	$60	$960	
						$32,400	
ANNUAL COST						$32,400	$32,400
CAPITAL COST (TABLE 9)						$360,000	$122,000
PRESENT VALUE						$636,000	$398,000

Note: Homeowner retains responsibility for power cost, tank, pump and well maintenance and future replacement.

Present value cost is based on a 10% discount rate and a 20 year project life.

TABLE 11

CAPITAL COST ESTIMATE

ALTERNATIVE E: PUBLIC WATER SUPPLY

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Item	Sites	Unit	Unit Cost	Cost	MPCA Sites	MPCA Cost
WATER SUPPLY						
Water Access Charge	81	Ea	$500	$40,500	10	$5,000
WATER MAIN						
4" DIP	10400	Ft	$12	$124,800	8900	$106,800
6" DIP	10500	Ft	$13	$136,500		
12" DIP(Oakdale)	1850	Ft	$28	$52,000		$52,000
Valves and Fittings (Oakdale)				$19,000		$19,000
Subtotal				$332,300		$177,800
OTHER						
Service Lines	81	Ea	$1,150	$93,000	10(2)	$30,000
Street Restoration				$80,000		$60,000
Valves and Fittings				$16,000		$7,000
Contingencies				$52,000		$25,000
Indirect Cost(1)				$150,000		$80,000
Start-up Fund				$25,000		$5,000
Well Abandonment	81	Ea	$1,000	$81,000	10	$10,000
Subtotal				$497,000		$217,000
CAPITAL COST				$870,000		$400,000
PRESENT VALUE				$870,000		$400,000

(1) Includes easements, legal, administration and engineering costs.
(2) Includes 2" copper line to stop box, 1.5" service line, water meter, stop box, connection to existing line at house and restoration.

TABLE 12

SUMMARY OF WATER SUPPLY COSTS

WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Service Area (81 homes)

	No Action	GAC Filters	New Residential Wells	Residential Cluster Wells	Public Water Supply
CAPITAL COST	$0	$91,000	$781,000	$360,000	$870,000
ANNUAL COST	$87,600	$110,000	$39,300	$32,400	$0
PRESENT VALUE	$746,000	$1,027,000	$1,116,000	$636,000	$870,000

MPCA Costs (10 homes)

	No Action	GAC Filters	New Residential Wells	Residential Cluster Wells	Public Water Supply
CAPITAL COST	$0	$23,000	$252,000	$122,000	$400,000
ANNUAL COST	$67,200	$74,600	$39,300	$32,400	$0
PRESENT VALUE	$572,000	$658,000	$587,000	$398,000	$400,000

Note: Present value cost is based on a 10% discount rate and a 20 year project life.

Annual costs for Public Water Supply would be paid by residents.

Minnesota Enforcement Decision Document

Name: Washington County Landfill

Location: Lake Elmo
Washington County, Minnesota

DOCUMENTS REVIEWED

I am basing my decision primarily on the following documents describing the analysis of the cost and effectiveness of the long-term water supply response action alternatives for the Washington County Landfill:

- Washington County Landfill Response Order by Consent, October 24, 1984.
- Ramsey/Washington County Sanitary Landfill Advisory Committee Report, December, 1984.
- Long Term Drinking Water Supply Plan, October, 1985.
- Gradient Control System Evaluation Report, December, 1985.
- Long Term Drinking Water Supply Plan, May, 1986.
- Minnesota Department of Health Memorandum, July, 1986.

DESCRIPTION OF APPROVED RESPONSE ACTION(S)

The approved Long-Term Water Supply Response Actions (RA) are:

- Long-term operation and maintenance of point of entry carbon treatment units for all residential wells which have been or in the future are issued drinking advisories by the Minnesota Department of Health (MDH) to reduce concentrations of volatile organic compounds (VOCs) to levels less than recommended allowable limits (RAL).
- Long-term residential well monitoring to verify treatment of VOCs.
- Long-term monitoring to verify that VOCs are the only contaminants requiring treatment.

DECLARATIONS

The approved Response Actions are consistent with the Minnesota Environmental Response and Liability Act of 1983 (ERLA), the Federal Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300). I have determined that the approved long-term water supply response action at the Washington County Landfill is a cost effective response action that provides adequate protection of public health, welfare, and the environment.

In accordance with Part 3.2 of Exhibit A to the Response Order by Consent between the Minnesota Pollution Control Agency and Washington County and Ramsey County (the Counties) dated October 24, 1984, the Counties shall implement the approved response action at and in the area of the Washington County Landfill.

7/7/86
Date

Michael Robertson
Dep. Executive Director
Minnesota Pollution Control Agency

Attachments:

Minnesota Enforcement Decision Document

MINNESOTA ENFORCEMENT DECISION DOCUMENT

This Minnesota Enforcement Decision Document (MEDD) summarizes the facts and determinations made by the Minnesota Pollution Control Agency (MPCA) staff in approving the recommended long-term water supply alternative for providing a permanent safe drinking water supply for residences with drinking advisories issued by the Minnesota Department of Health (MDH) as a result of releases and threatened releases of hazardous substances from the Washington County Landfill (Landfill). Detailed information regarding these facts and determinations is located in the MPCA files.

LANDFILL LOCATION

The Landfill is located in Lake Elmo, Washington County (see Figure 1). The Landfill is owned and operated by Washington County and Ramsey County (the Counties).

SITE DESCRIPTION AND HISTORY

The Landfill was operated and is owned by the Counties through a joint power agreement. The Landfill was operated from 1969 to 1975 for the disposal of approximately 2.5 million cubic yards of waste. Following Landfill closure a ground water monitoring program was instituted. In 1981 volatile organic compounds were detected through the monitoring program. Subsequent monitoring revealed that several nearby residential wells contained contaminated ground water.

ENFORCEMENT

On October 24, 1984 the Counties and the MPCA executed a Response Order by Consent (Order). The Order requires the Counties to operate a ground water gradient control system to capture and treat contaminated ground water, monitor ground water, provide applicable residents with an interim supply of bottled water, and propose and implement a long-term drinking water supply for applicable residents. The Landfill is included on the Minnesota Permanent List of Priorities and the National Priorities List with a score of 42.

REMEDIAL INVESTIGATION

Remedial Investigation (RI) conducted by the Counties and the MPCA have determined the following:

1. The Landfill has released hazardous substances to ground water beneath the Landfill property. The released hazardous substances are: 1,1-dichloroethylene; tetrachloroethylene; trichloroethylene; 1,2-dichloroethane; 1,1,2-trichloroethane; benzene; 1,2-dichloroethylene; 1,1,1-trichloroethane; 1,2-dichloropropane; chlorobenzene; ethyl benzene; toluene; bis-2-ethyl hexyl phthalate; diethyl phthalate; di-n-butyl phthalate; 1,1-dichloroethane; and isophorone.

2. The extent of release is generally limited to the alluvial aquifer with traces of hazardous substances in the St. Peter and Prairie du Chien aquifers.

3. The Landfill has released hazardous substances beyond the Landfill property boundary. The hazardous substances released beyond the property boundary are: 1,1-dichloroethane; 1,1-dichloroethylene; trichloroethylene; 1,1,1-trichloroethane and tetrachloroethylene.

4. The concentrations of hazardous substances in three residential wells has exceeded recommended allowable limits (RAL) for drinking water set by the MDH and approached RAL for another well.

5. The ground water gradient control system has reduced migration of contaminated ground water and has contributed to a reduction in the concentration of hazardous substances in ground water at and in the area of the Landfill.

6. The following chart lists residential wells which have had drinking advisories and shows the range of concentrations (in parts per billion) of the hazardous substances which have approached or exceeded RAL.

Residential Well	Hazardous Substance	RAL	Concentration Range	Latest Concentration (May,1986)
J. Downs	Trichloroethylene	31.2	4-123	21
	Tetrachloroethylene	6.9	1-10	2
F. Downs	Tetrachloroethylene	6.9	<0.2-40	<0.2
L. Richert	Tetrachloroethylene	6.9	0.4-10	<1.0
G. Hueslman	Trichloroethylene	31.2	1.3-16	16

7. The latest residential well monitoring data from May, 1986 indicated that all residential wells were below RAL.

FEASIBILITY STUDY FINDINGS

Based upon the RI, and in accordance with Part 3.2 of Exhibit A to the Order the MPCA staff has determined that response actions are necessary to provide residences that have been issued drinking advisories with a long-term permanent safe drinking water supply.

ALTERNATIVES EVALUATION AND DETAILED ANALYSIS

The Ramsey/Washington County Sanitary Landfill Advisory Committee Report dated December, 1984 evaluated the following alternative response actions: bottled water, carbon treatment, cluster wells, central water supply and hook-up to the Oakdale water supply.

Based upon this report, the MPCA staff determined that all of these alternatives would be effective remedies to provide permanent safe drinking water except bottled water. Bottled water is a temporary rather than permanent measure.

The Counties proposed to implement the carbon treatment alternative. Of the effective alternatives, this alternative had the least associated cost. A comparison of costs which was presented in the report is attached to this MEDD.

DESCRIPTION OF THE APPROVED ALTERNATIVE

By letter dated May 14, 1986 the Counties proposed the following long-term water supply Response Action:

1. Installation of individual point of entry granular activated carbon treatment units in all residences which presently or in the future have drinking water advisories for the purposes of removing volatile organic compounds and providing a permanent safe drinking water supply.

2. Routine carbon change outs to ensure adequate treatment and reduce bacterial growth.

3. Quarterly sampling and analysis for 1,1-Dichloroethylene; Trichloroethylene; 1,1,1-Trichloroethane; and Tetrachloroethylene to determine the effectiveness of treatment.

4. Biological monitoring to verify the biological safety of the drinking water system.

The MPCA staff have determined that the proposed alternative would be effective in providing a permanent safe water supply with modifications which provide for a more detailed monitoring program. The modifications are specified in the MPCA's approval letter.

DETAILED ANALYSIS REPORT

The recommended alternative is proposed for implementation in accordance with applicable environmental laws including: the Resource Conservation and Recovery Act, Clean Water Act, Minnesota Environmental Response and Liability Act (MERLA), the Rules and Regulations of the MPCA and the Minnesota Department of Health.

COMMUNITY RELATIONS

Prior to executing the Order the MPCA notified interested and affected parties of the proposed actions and held a MPCA Board meeting which was open for public comment. No public comments were received. Furthermore, following receipt of the Long-Term Water Supply proposal the MPCA staff held a public meeting in Lake Elmo and solicited public comment.

The public requested increased monitoring and expressed concerns about property values. The MPCA staff has considered the comments and has required increased monitoring. Public concern regarding property values were considered but have been determined to fall outside the scope of the Order and ERLA.

IMPLEMENTATION SCHEDULE

The approved response actions will be implemented in accordance with the Consent Order and the approved implementation schedule.

FIGURE 1

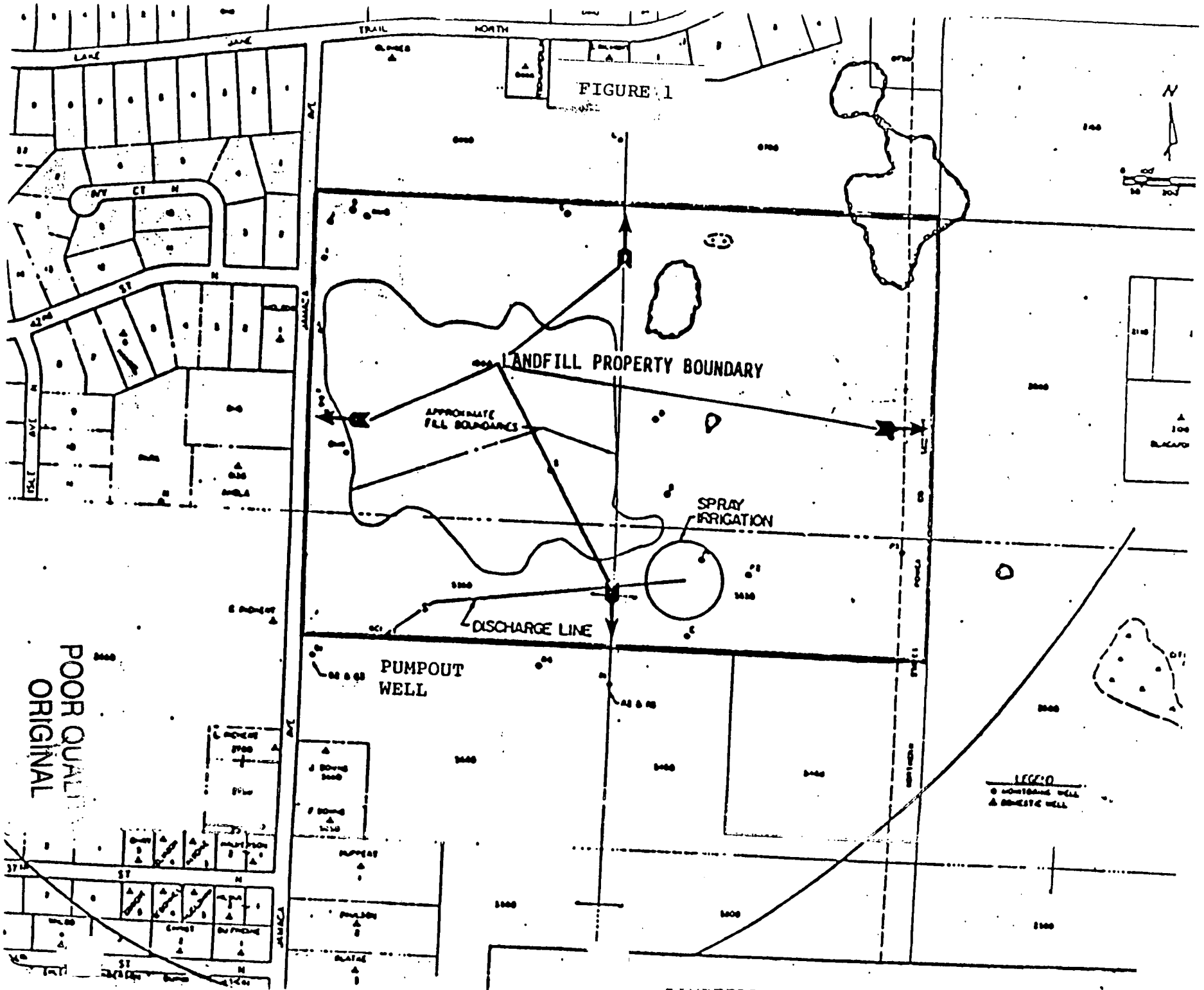

TRAIL
NORTH
LANDFILL PROPERTY BOUNDARY
APPROXIMATE FILL BOUNDARIES
SPRAY IRRIGATION
DISCHARGE LINE
PUMPOUT WELL
POOR QUALITY ORIGINAL

TABLE 3: ALTERNATIVE WATER SUPPLY SYSTEMS

ESTIMATED EXPENSE - WASHINGTON COUNTY SANITARY LANDFILL NO. 1

Water Supply Options	Estimated Expense: Capital*	Operation Maintenance	Monitoring	Total Annual	Annual Cost per Household
A. Bottled Water - 4 homes	$ --	$ 3,200	$ --	$ 3,200	$ 800
B. Granular Activated Carbon Units					
1) Exceeding Criteria (4 homes)	6,000	500	280	1,485	370
2) Detectable (13 homes)	19,500	1,675	910	4,825	370
3) Service Area A (52 homes)	78,000	6,500	910	16,570	320
C. Cluster Well Systems					
1) Exceeding Criteria (1 system, 4 homes)	30,000	2,000	70	5,595	1,400
2) Detectable (3 systems, 13 homes)	90,000	6,000	210	16,780	1,290
3) Service Area A (10 systems, 52 homes)	300,000	20,000	700	55,940	1,080
D. Lake Elmo Water Supply (see Table 4)					
Service Area A - 52 homes	355,000	5,500	70	41,375	800
Service Area A - 130 homes	696,000	11,000	70	81,270	630
Service Area B - 325 homes	1,678,000	28,000	70	197,310	610
E. Oakdale Water Supply (see Table 5)					
Service Area A - 52 homes	339,000-390,000	5,700	--	39,890-45,035	770-870
Service Area A - 130 homes	672,000-723,000	11,100	--	78,880-84,020	610-650
Service Area B - 325 homes	1,695,000-1,746,000	27,800	--	198,760-203,900	610-630

*Annual capital cost for GAC units and Cluster Well System amortized for 20 years at 10 percent annual interest.

Annual capital cost for Lake Elmo and Oakdale Water Supply amortized for 50 years at 10 percent annual interest.