APR 2 7 1995

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April 25, 1995

Mr. Chuck Schwer
Sites Management Section
Hazardous Materials Management Division
Department of Environmental Conservation
Agency of Natural Resources
103 South Main Street
West Building
Waterbury, VT 05671-0404

SUBJECT: EPA Contract No.: 68-W9-0045
Work Assignment No.: 23-1JZZ
Final Site Inspection Prioritization Report
Rathe Brothers' Landfill
Colchester, Vermont
TDD No.: 9309-03-ACX
CERCLIS No.: VTD071095731

DOCUMENT NO.: 7710-023-ST-BQLQ

Dear Mr. Schwer:

One copy of the Final Site Inspection Prioritization Report for Rathe Brothers' Landfill in Colchester, Vermont, is enclosed. If you have any comments or questions regarding this submittal, please contact me at (617) 742-2659.

Very truly yours,

CDM FEDERAL PROGRAMS CORPORATION

Tara Abbott Taft
ARCS I Work Assignment Manager

Approved:

Myron S. Rosenberg, Ph.D., P.E.
ARCS I Program Manager

TAT/lwd

Attachment

cc: Sharon Hayes, EPA Work Assignment Manager (letter only)
Don Smith, EPA Vermont Site Assessment Manager (letter only)
Julia Nault, CDM (letter only)
Lisa Drake, CDM Site Manager (letter only)
Document Control File (letter only)

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ARCS I

Final Site Inspection Prioritization Report

Rathe Brothers' Landfill

Colchester, Vermont

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY, Region I
Waste Management Division
Boston, MA

Work Assignment No.:	23-1JZZ
EPA Region:	I
CERCLIS No.:	VTD071095731
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Contract No.:	68-W9-0045
Document No.:	7710-023-FR-BQLR
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Colchester, Vermont

CERCLIS No. VTD071095731
TDD No. 9309-03-ACX
Work Assignment No. 23-1JZZ
7710-023-FR-BQLR

INTRODUCTION

The CDM Federal Programs Corporation (CDM) Alternative Remedial Contracting Strategy (ARCS) team was requested by the U.S. Environmental Protection Agency (EPA) Region I Waste Management Division to perform a Site Inspection Prioritization (SIP) of the Rathe Brothers' Landfill property in Colchester, Vermont. Tasks were conducted in accordance with the ARCS Contract No. 68-W9-0045, the SIP scope of work dated September 3, 1992, and technical specifications provided by EPA under Work Assignment No. 23-1JZZ, which was issued to CDM on September 22, 1992. A Preliminary Assessment (PA) was completed by the Vermont Agency of Environmental Conservation (VTAEC), Waste Management Division, in September 1985. The VTAEC is now known as the Vermont Department of Environmental Conservation (VTDEC) under the Vermont Agency of Natural Resources. On the basis of the information provided in the PA report, the Rathe Brothers' Landfill Site Inspection was initiated. A Site Inspection (SI) report was completed by the VTAEC, Waste Management Division, on April 1, 1987. Updated information encountered during the SIP process is included in this report. Relevant text from the SI report is presented in this report in a smaller font.

Background information used in the generation of this report was obtained through file searches conducted at the VTDEC, telephone interviews with town officials, conversations with persons knowledgeable of the Rathe Brothers' Landfill property, and conversations with other federal, state, and local agencies. Additional information was collected during the CDM onsite reconnaissance on August 11, 1994, and environmental sampling on October 5 and 6, 1994.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other federal, state, or local regulations. SIPs are intended to provide a preliminary screening of sites to facilitate EPA's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

SITE DESCRIPTION

Rathe Brothers' Landfill is located in Colchester, Chittenden County, Vermont (latitude 44° 31′ 07.5″ N, longitude 73° 11′ 24.5″ W) (see Figure 1: Location Map) [60]. Access to the landfill is from Rathe Road, west of Routes 2 and 7. The landfill operated from 1967 through 1992 [20,43,70]. The Rathe Brothers' Landfill property was owned by Rathe Brothers' Inc. and operated by Louis and Lawrence Rathe [46,67]. The full Rathe property is 112 acres; the landfilled portions cover approximately 13 acres in the central to northern part of the property (see Figure 2: Site Sketch with Previous Sampling Locations and Figure 3: Area Map) [9,20]. The 112-acre property is identified as parcel number 23, property map number 3 for the town of Colchester [8,9]. In this report, the full property is referred to by the site name or as "the property." The landfill itself is referred to as "the landfill."

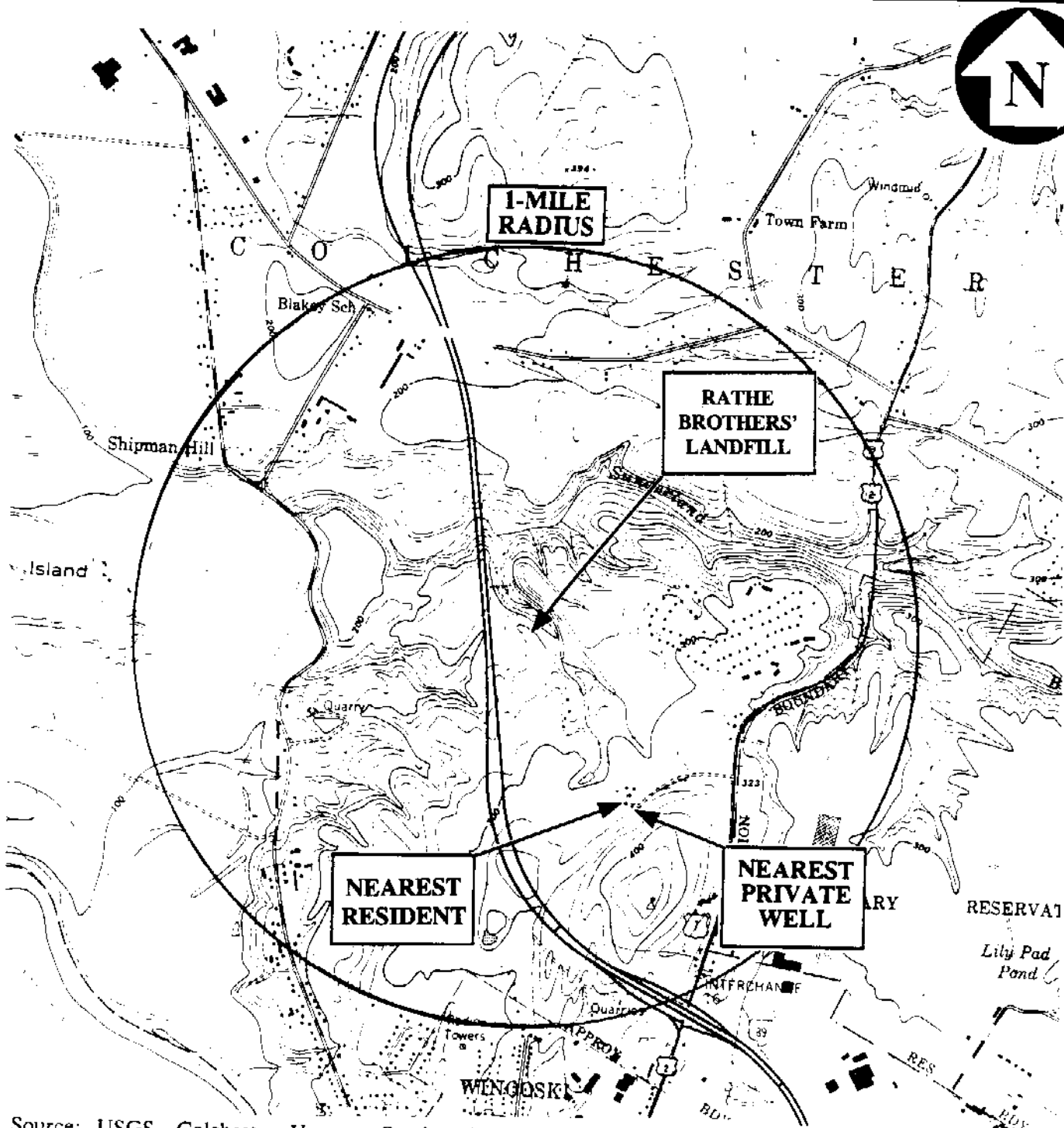
Rathe Brothers' Four, Inc. currently operates an auto salvage yard on the property [6]. Additionally, Louis Rathe's son, Armand Rathe, and his family live in a house on the same property as the landfill/salvage yard [6]. The house and a few garages are located approximately 1,500 feet south of the landfill boundary [60]. The salvage yard is operated out of two buildings (a trailer and a garage) located near the landfill boundaries [60]. The roads leading to the Rathe household and into the landfill/salvage yard area are paved; all other portions of the property are unpaved [6].

The landfill is divided into two sections, known as section III and section IV [46]. There are no records of the existence of landfill sections named I or II [6,20]. The landfill is currently inactive, and all sections are capped with a minimum of 2 feet of cover material [6,22,30,43]. Grass and other vegetation cover the landfilled areas [6]. Landfill section III, formerly operated by the city of Burlington, is double-lined with a functioning leachate collection system [22].

> The landfill site is immediately bordered to the north and east by an unnamed tributary flowing north to Sunderland Brook. . . (Rathe Brothers' Inc.) owns land on the other side (northeast) of the tributary . . . This land is wooded with some open areas. On the northern edge deep ravines have been cut by small tributaries to Sunderland Brook. Bordering the west side of the landfill and the associated auto junkyard areas is Interstate Route 89. . . The land south of the landfill is partly wooded and partly open, rising gently about 150 feet and then sloping back down to the intersection of Interstate Route 89 with Route 7 [67].

Also bordering the landfill to the west is a stone-lined drainage ditch that drains to a culvert underneath Route 89. This culvert is presumed to discharge on the west side of Route 89; however, the exact discharge point has not been verified [6].

Surface water runoff drains from the east portion of the landfill toward the unnamed tributary bordering the landfill. From the west portion of the landfill, surface water drains to the stone-lined drainage ditch [6]. The junkyard areas west and south of the landfill generally slope gently toward Route 89 to the west; surface water runoff presumably flows in that direction [60]. Local land use in the area surrounding Rathe Brothers' Landfill is residential, commercial, light industrial, and agricultural [60,67].



Source: USGS. Colchester, Vermont Quadrangle. 7.5' series (Topographic). Photorevised 1972.

LOCATION MAP
RATHE BROTHERS' LANDFILL
COLCHESTER, VERMONT

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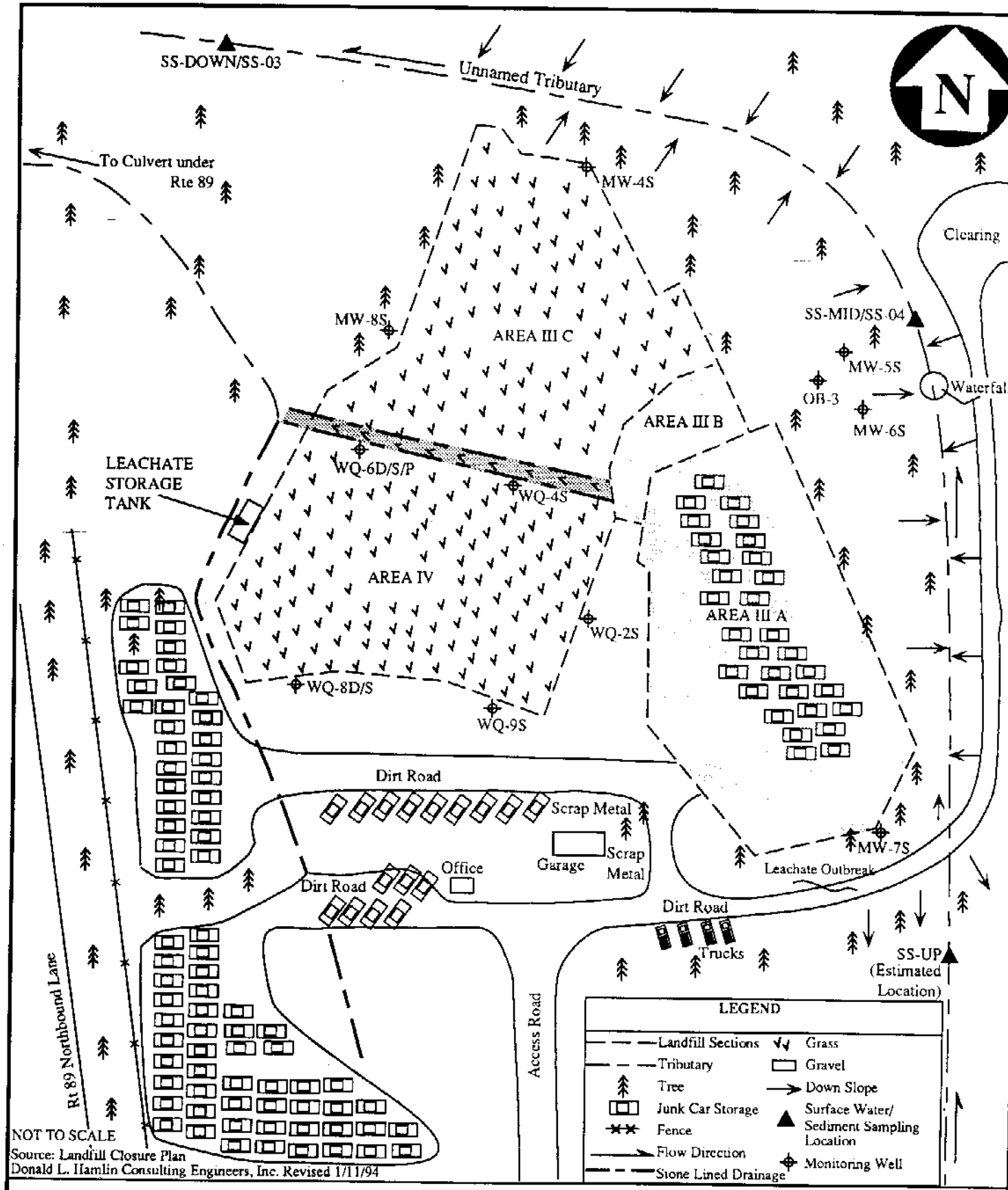
Figure 1



SITE SKETCH WITH PREVIOUS SAMPLING LOCATIONS
RATHE BROTHERS' LANDFILL
COLCHESTER, VERMONT

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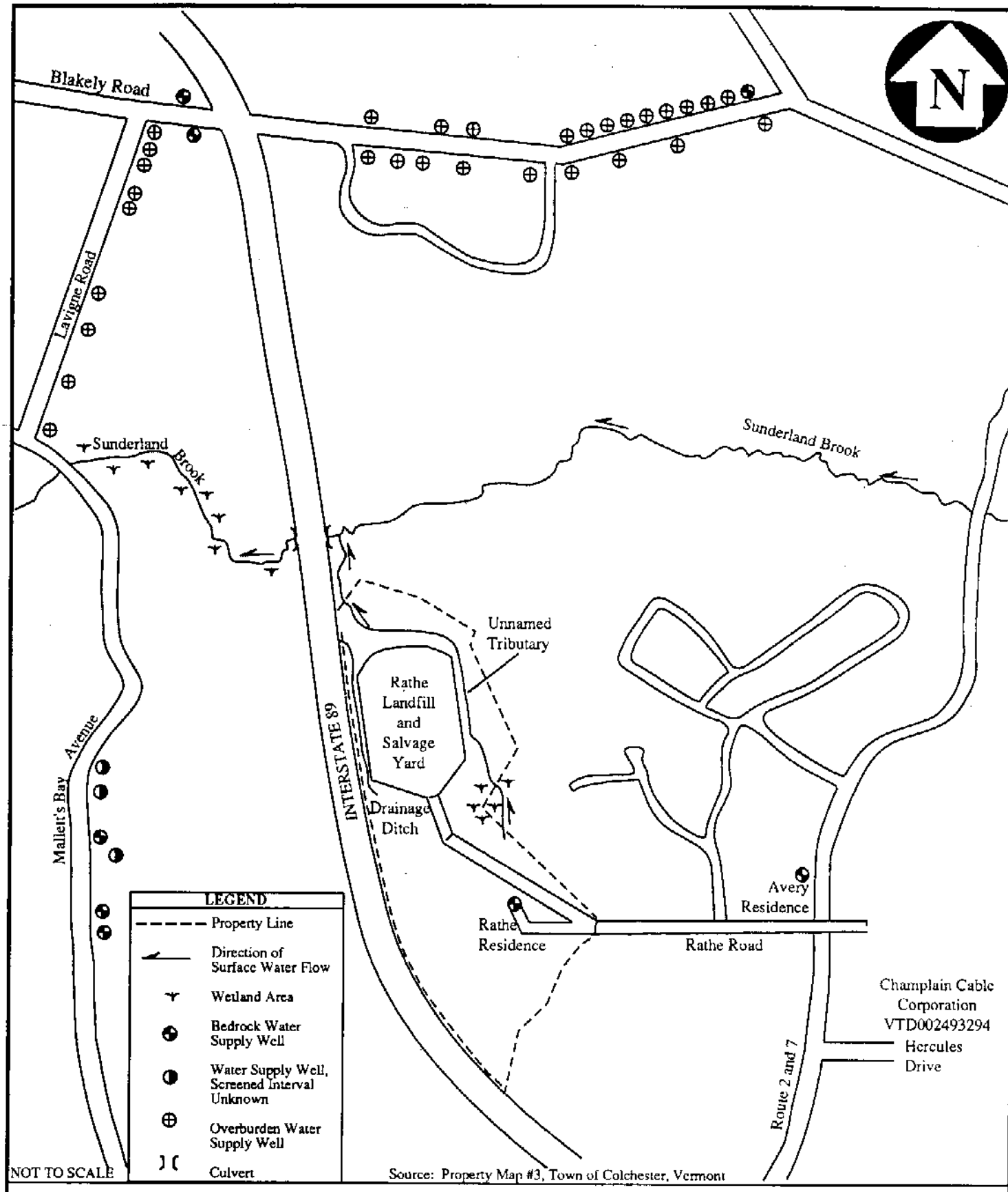
Figure 2



AREA MAP
RATHE BROTHERS' LANDFILL
COLCHESTER, VERMONT

CDM FEDERAL PROGRAMS CORPORATION
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Figure 3

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

Louis and Lawrence Rathe applied to the state of Vermont in 1965 to operate a landfill on their property and began operation in 1967 [55,67]. In 1972 and 1973, operational problems were noted during inspections by VTAEC, now VTDEC under the Vermont Agency of Natural Resources. Inspection reports indicate that landfill areas had inadequate cover application and that the landfill posed a health hazard and a possible pollution threat to state waters. No indication of the presence of hazardous wastes was given [2,4]. Engineering plans were submitted to the state as part of the Solid Waste Disposal Facility Certification process in 1976, and the landfill eventually received certification in October 1979 [39,67].

Wastes accepted at the landfill included household and commercial garbage, construction and demolition debris, stumps, brush, natural wood, and tires [71]. Many manufacturers and industries disposed of wastes at the landfill, according to the Rathe Brothers' Landfill Closure Plan [29]. Over the years of operation, the Rathe Brothers' Landfill accepted small amounts of gasoline- and fuel-oil contaminated soils and asbestos wastes, as approved by VTDEC, Solid Waste Division [12,32,33,34,41,42,44,45].

> In 1981, General Electric (G.E.) Company-A&ESD of Burlington, Vermont notified EPA under Section 103 (c) of CERCLA that from 1971 to 1972 an estimated 7,000 gallons of industrial wastes were disposed of at the Rathe Landfill. In a 1985 letter to VTAEC, C.H. Brunswick, Burlington G.E. Manager, specifies that under the RCRA category F001, (spent halogenated solvents used in degreasing and their sludges) only "trichloroethylene" was taken to the Rathe Landfill. He also confirms that heavy metal wastes including cadmium, chromium, and lead were disposed of at the Rathe Landfill [67].

Rathe Brothers' Landfill was listed in Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System (CERCLIS) on June 1, 1981, following CERCLA notification by General Electric Company [59,67].

> In a May 1985 telephone conversation with VTAEC representative, John Lavallee of Lavallee and Roy Inc., a metal cutting tools manufacturer in Winooski, Vermont, confirmed that his company took approximately 5 gallons per week of spent mineral spirits and one or two 55-gallon drums of cutting oil sludge per week to the Rathe Landfill. The company started disposing of the wastes at Rathe's when the landfill opened in 1967 and continued through 1979. (The company is now named Lavallee and Ide Inc.) [67].
>
> In a letter from their lawyer dated January 22, 1986, Louis and Lawrence Rathe denied accepting any drums of hazardous waste or drums with unknown contents from General Electric Co. or any other firm [67].

In an April 5, 1989, letter from the Rathes' consultant, Donald L. Hamlin Consulting Engineers, Inc. (Hamlin Engineers), the Rathes clarified that they did accept wastes from Lavallee and Roy [1].

A landfill recertification was submitted by Hamlin Engineers for the Rathe Brothers' Landfill in December 1984. It was never processed by VTDEC [70].

In June 1984, it came to the attention of VTDEC that waste motor oil was being used as a dust suppressant on a 0.3- to 0.4-mile stretch of the landfill access road, which is now paved [24,27]. This practice used approximately 1,000 gallons of oil, once a year, for 16 years. A visit by VTDEC personnel indicated that this practice appeared well maintained, not causing any runoff from the road [24]. The following year, the Rathes had the oil tested prior to applying the oil to the road. The results indicated that the oil was contaminated with polychlorinated biphenyls (PCBs) at 20 parts per million (ppm). VTDEC did not allow the application of that oil onto the access road [25].

In 1984-85, VTAEC conducted sampling at the nearby CERCLIS site, Champlain Cable Corporation (Champlain Cable). Sunderland Brook tributaries adjacent to Champlain Cable (upstream of Rathe Brothers' Landfill) were sampled and the following were detected: methylene chloride, 1,1,1-trichloroethane (1,1,1-TCA), tetrachloroethylene (PCE), toluene, 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA). National Pollutant Discharge Elimination System (NPDES) discharges to the tributary contained similar substances as well as chloroform and 1,2-dichloroethane (1,2-DCA) [67,68]. Similar contaminants have also been detected in groundwater at the Champlain Cable property [77]. Champlain Cable is located approximately 0.75 mile southeast of the Rathe Brothers' Landfill [60].

In September 1985, VTAEC completed a Preliminary Assessment of Rathe Brothers' Landfill [59]. In 1987, the VTDEC Hazardous Materials Division completed a Superfund SI of the Rathe Brothers' Landfill. Groundwater and surface water samples were collected and analyzed for metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) (see Figure 2). Metals, VOCs, and SVOCs were detected in surface water, sediment, and groundwater samples [67]. More detailed results are presented in the Groundwater and Surface Water Pathway sections of this report.

On July 31, 1987, VTDEC issued a Transitional Operating Authority that allowed the Rathes to continue operations under the terms of the 1979 certification until an assessment of the facility could be completed [70].

On June 30, 1989, the municipalities served by the landfill ceased disposal activity at the Rathe Brothers' Landfill. On August 14, 1989, VTDEC issued an order requiring the Rathes to begin actions for landfill closure since the landfill was no longer accepting wastes. On November 11, 1989, an agreement was made between Rathe Brothers, Inc., and the municipalities of Burlington, Winooski, Colchester, and Shelburne. The agreement provided that the Rathes would lease landfill section IIIC to Colchester for solid waste disposal and that landfill section IV would be leased to Burlington for the construction and operation of a new lined landfill. On November 15, 1989, VTDEC issued an order allowing the operation of section IIIC. Colchester would be the operator of landfill section IIIC, and wastes would be accepted from Colchester, Shelburne, Winooski, and Huntington. The responsibility for closure and post-closure care of section IIIC remained the responsibility of the Rathes [46,70]. The responsibility for section IV closure and post-closure care for a period of 20 years was the city of Burlington's [46].

A Solid Waste Disposal Facility Interim Certification for the entire landfill facility (sections IIIC and IV) was granted by VTDEC on January 5, 1990, covering the period from January 5, 1990 to January 5, 1992 [70]. Section IV, a 4-acre municipal landfill operated by the city of Burlington from 1990 to 1992, is double-lined with a leachate collection system [22,43,46]. The leachate collection system operated from the beginning of the operation of section IV and currently continues to collect leachate from the landfill [5, 19]. Leachate drains through an 18-inch sand blanket, is collected by gravity feed through piping and a manhole, to a 15,100-gallon holding tank. This double-walled steel tank rests on a concrete pad [69]. The contents of the tank are pumped and transported to a city wastewater treatment facility under the conditions of an NPDES permit [69]. Section IV is contained separately from section III, operated by the Rathes [22,30].

The leachate collection system was tested monthly in 1990. Hazardous substances detected in the leachate include trichloroethylene (TCE), 1,1-DCA, 1,1,1-TCA, methylene chloride, acetone, xylene, chloroethane, ethylbenzene, toluene, 2-butanone, benzyl alcohol, benzoic acid, phenol, cadmium, copper, iron, lead, manganese, nickel, and zinc [5]. Other SVOCs, pesticides, PCBs, cyanide, and arsenic were consistently below detection limits [69]. Leachate sampling in 1992 and 1993 detected similar contaminants, plus 1,1-DCE and methyl-t-butyl ether (MTBE) [35,36,37].

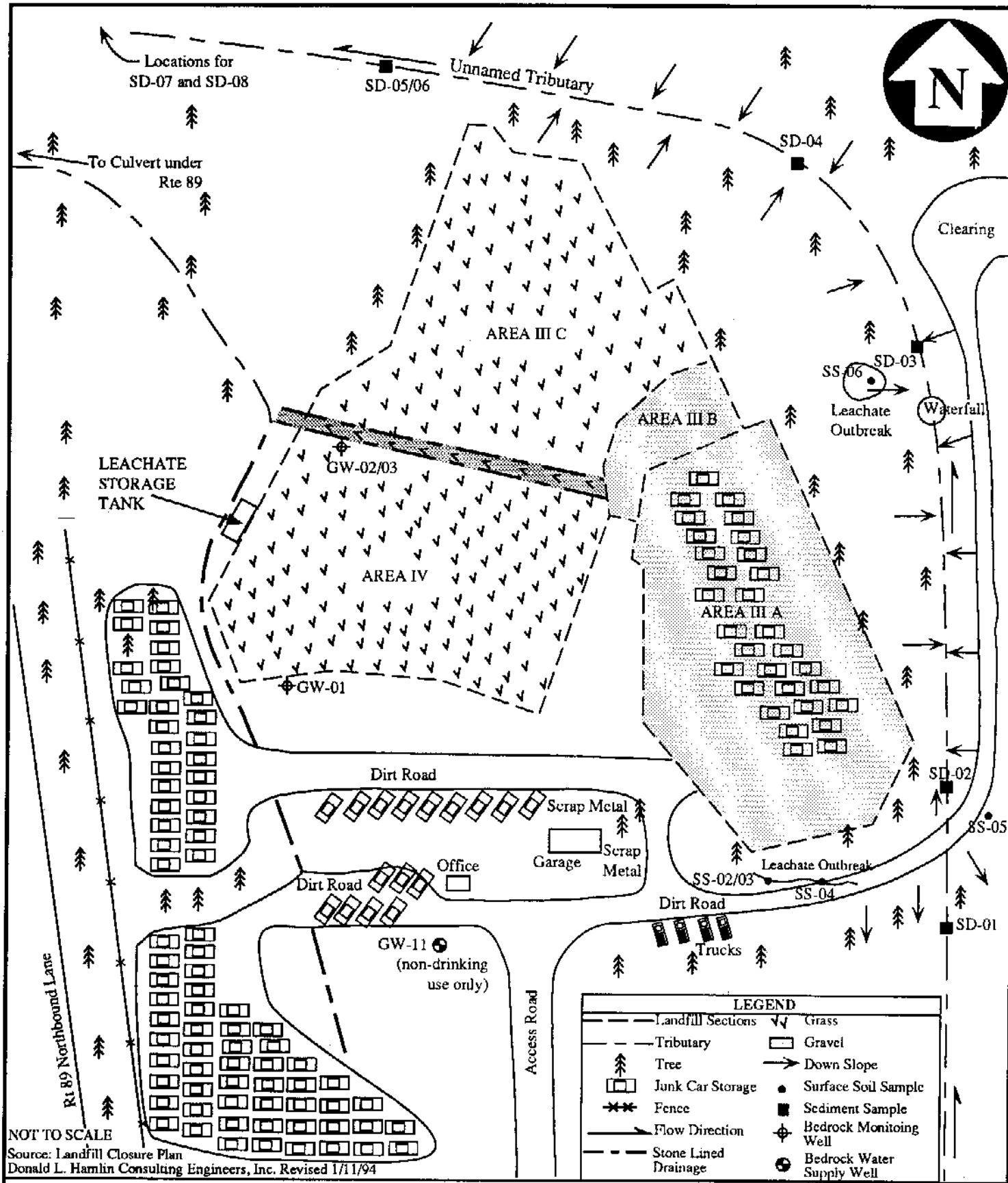
In 1990, the city of Burlington hired Wagner, Heindel, and Noyes, Inc. (WH&N) to perform a study of groundwater conditions surrounding section IV of the landfill to establish base (pre-section IV development) conditions. Contaminants determined to be present in the overburden and bedrock wells included many VOCs and metals [76]. See the Groundwater Pathway section for details.

Closure of landfill sections III and IV was complete in December 1992 [20,43,70]. Post-closure monitoring for the Rathe Brothers' (section III) landfill includes semi-annual sample collection at tributary locations SS-3 and SS-4, and at wells OB3, MW-4S, MW-5S, MW-6S, MW-7S, and MW-8S. All samples are analyzed for eight dissolved metals, chemical oxygen demand (COD), chloride, pH, conductivity, total organic halogens (TOX), and EPA Method 8240 VOCs [29]. Post-closure monitoring for the Burlington (section IV) portion of the landfill include sampling some overburden wells and two bedrock monitoring wells [38]. Results are discussed in the Groundwater Pathway and Surface Water Pathway sections.

Auto salvage operations, including a wrecker service; an auto salvage yard, recycling cars and other scrap metal; and auto parts sales, have occurred on the property since 1969 [20,39]. In 1990, the salvage yard operation became a separate business entity under Rathe Brothers' Four, Inc. [20]. Before development of landfill section IV, reportedly 500 vehicles were parked in that 4-acre area [76]. On CDM's reconnaissance visit on August 11, 1994, hundreds of cars were noted on the property. While some stained soil areas were also noted, in general, the salvage yard appeared to be well maintained [6]. The 1990 WH&N report noted that engine block removal and other large-scale stripping processes took place in the southeastern corner of the property, possibly using some solvents [76]. The salvage yard operator reports that solvents have never been used on the property [20]. Currently, scrap metal is transported for recycling by R. Brown & Sons Mobile Car Crushers. Waste oil is reused onsite in an oil burning furnace. Gasoline from junk cars is reused in other vehicles. Waste antifreeze is burned onsite [20].

At the time of CDM's reconnaissance of the property, the landfill was inactive and all capping and closure activity was complete. The caps were observed to be intact and well vegetated. One leachate outbreak was observed in the southeastern corner of the landfill, near the edge of section IIIA. Orange leachate with a purple sheen was running out of an embankment, down the dirt road, and appeared to be running down to the tributary, upstream of where the dirt road crosses over the tributary. It should be noted that the upstream surface water monitoring location (SS-4), as identified by Hamlin Engineers on the day of the reconnaissance, is several yards downstream of the point of entry of this leachate [6].

On October 5 and 6, 1994, CDM field personnel collected five surface soil samples, seven sediment samples, three monitoring well samples, and two tap water samples from the Rathe Brothers' Landfill property. Additionally, one sediment sample was collected from a property located northwest of the landfill, and six tap water samples were collected from nearby residences (see Figure 4: Site Sketch with CDM Sampling Locations and Figure 5: Area Map with CDM Sampling Locations) [6]. Sampling included one duplicate of each sample type (surface soil, sediment, and groundwater) for quality control. The purpose of the sampling event was to determine the types and concentrations of hazardous substances onsite and to investigate any migration of hazardous substances from the landfill property. Field activities were performed according to the *Task Work Plan for Onsite Reconnaissance and Sampling at Rathe Brothers' Landfill*, with the exceptions discussed in the following paragraphs. All sediment and soil samples were submitted for full Target Compound List (TCL) and Target Analyte List (TAL) analysis through the EPA Contract Laboratory Program (CLP) Routine Analytical Services (RAS). All groundwater samples were submitted for analysis of VOCs, SVOCs, pesticides/PCBs, metals, and cyanide, by low concentration methods via CDM's Delivery of Analytical Services (DAS) with the exception of GW-01, for which only enough sample could be obtained for VOC and SVOC analysis. All samples collected met data quality objectives as stated in the Task Work Plan. The inorganic and organic analytical results were reviewed according to EPA Tier II data validation protocols [47,48,49,50]. See the Waste/Source Sampling, Groundwater Pathway, and Surface Water Pathway sections for sampling results.



NOT TO SCALE

Source: Landfill Closure Plan
Donald L. Hamlin Consulting Engineers, Inc. Revised 1/11/94

SITE SKETCH WITH CDM SAMPLING LOCATIONS
RATHE BROTHERS' LANDFILL
COLCHESTER, VERMONT

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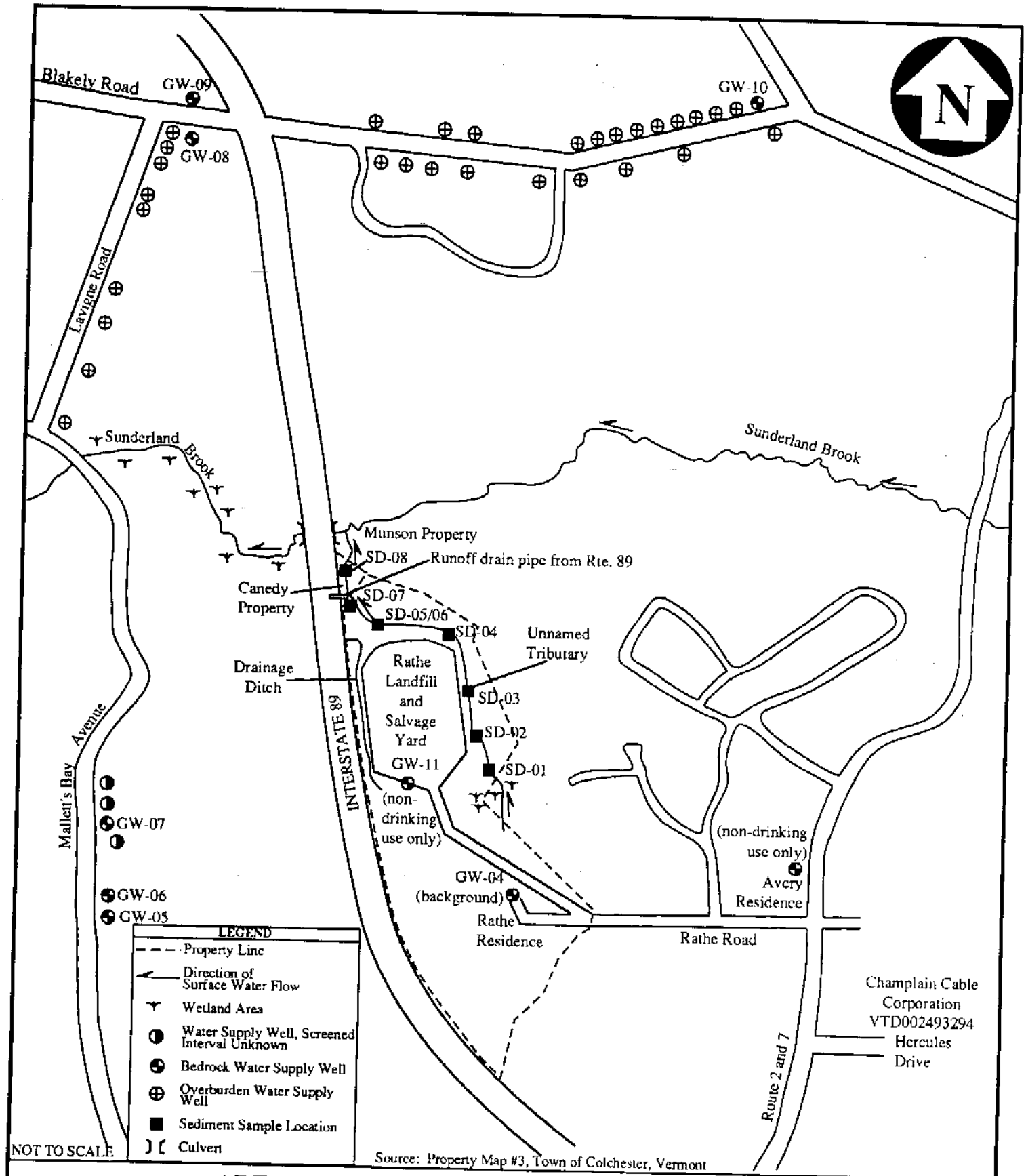
Figure 4



AREA MAP WITH CDM SAMPLING LOCATIONS
RATHE BROTHERS' LANDFILL
COLCHESTER, VERMONT

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Figure 5

Table 1 presents identified structures or areas on the Rathe Brothers' Landfill property that are potential sources of contamination, the containment factors associated with each source, and the relative location of each source.

TABLE 1

Source Evaluation for
Rathe Brothers' Landfill

Potential Source Area	Containment Factors	Spatial Location
Landfill - section III	Minimum of 2 feet of vegetated cover material	North and northeast portion of property
Landfill - section IV	Double liner and leachate collection system; minimum of 2 feet of vegetated cover material	Northwest portion of property
Contaminated soil	None	Access Road, leachate areas, possibly other unidentified areas

[6,22,24,25,27,30,47,49]

Table 2 summarizes the types of potentially hazardous substances that have been disposed of, used, or stored on the property. The table was developed based on historic information and results of sampling performed by CDM. Documentation of disposal at the landfill (both sections) is incomplete.

TABLE 2

Hazardous Waste Quantity for Rathe Brothers' Landfill

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Petroleum contaminated soils	> 130 ft^3	N/A	Intermittent disposal	Landfill section III
Asbestos wastes	> 12 ft^3	N/A	Intermittent disposal	Landfill section III
(TCE) cadmium, chromium, and lead wastes	7,000 gallons of combined wastes	N/A	1971-1972	Landfill section III
Mineral spirits	5 gallons/week	N/A	Possibly as long as 1967-1979	Landfill section III
Cutting oil sludge	1 or two 55-gallon drums/week	N/A	Possibly as long as 1967-1979	Landfill section III
Waste motor oil	1,000 gallon/year	16 years	1968-1984	Contaminated soil
Acetone	Undetermined	N/A	Undetermined	Contaminated soil
Antimony	Undetermined	N/A	Undetermined	Contaminated soil
Barium	Undetermined	N/A	Undetermined	Contaminated soil
Calcium	Undetermined	N/A	Undetermined	Contaminated soil
Cobalt	Undetermined	N/A	Undetermined	Contaminated soil
Iron	Undetermined	N/A	Undetermined	Contaminated soil
Magnesium	Undetermined	N/A	Undetermined	Contaminated soil
Manganese	Undetermined	N/A	Undetermined	Contaminated soil
Nickel	Undetermined	N/A	Undetermined	Contaminated soil
Potassium	Undetermined	N/A	Undetermined	Contaminated soil
Zinc	Undetermined	N/A	Undetermined	Contaminated soil

N/A = Not applicable
[24,25,27,32,33,34,41,42,44,45,47,49,67]

Champlain Cable (VTD002493294) is listed in the Resource Conservation and Recovery Act Information System (RCRIS) and in CERCLIS and is located within 1 mile of Rathe Brothers' Landfill [58,59]. Other properties listed in CERCLIS within the town of Colchester, but not verified to necessarily be within 1 mile of the property, are Harbour Industries (VTD988366431) and Winooski Dump (VTD980914980) [59]. Another RCRIS facility in Colchester, whose location has not been verified, is General Electric Co. (VTD000649970) [58].

WASTE/SOURCE SAMPLING

There is no record of any source sample collection or analysis prior to 1994. On October 5, 1994, CDM collected four grab surface soil samples from potential source areas and one grab background sample at Rathe Brothers' Landfill. All samples from potential source areas were collected from 2 to 6 inches below ground surface (bgs). The background sample was collected from an exposed cut into an embankment, at approximately 2 feet below ground surface. This background location was selected because the soil at this location was most similar to that of the other samples [6]. Figure 4 illustrates the approximate locations of the samples. Table 3 presents a summary of source samples collected by CDM.

TABLE 3

Sample Summary: Rathe Brothers' Landfill
Source Samples Collected by CDM on October 5, 1994

Sample Location No.	CDM Sample #/ Traffic Report #	Time (hrs)	Remarks/ Sample Depth	Sample Source
SS-02	MAFJ65 (I) AHY47 (O)	1655	Grab/At exposed embankment, collected at 2-6 inches/yellowish brown silt with some medium to coarse sand	Leachate outbreak along dirt road, southeast corner of the landfill
SS-03	MAFJ66 (I) AHY48 (O)	1655	Same as SS-02	Duplicate of SS-02 for quality control (QC).
SS-04	MAES65 (I) AHY55 (O)	1755	Grab/In a low lying area, collected at 2-6 inches/yellowish brown sandy silt	Leachate outbreak along embankment and dirt road, southeast corner of the landfill.
SS-05	MAES66 (I) AHY56 (O)	1845	Grab/At exposed cut into earth, collected at approximately 2 feet below ground surface/ very fine sand and silt	Background sample collected on southeast side of dirt road and tributary.
SS-06	MAFJ58 (I) AHY40 (O)	1720	Grab/2-6 inches/orange clay mixed with gray clay	Leachate outbreak on steep slope, 5 feet above tributary level, and approximately 30 feet downstream of waterfall.

I = Inorganic
O = Organic

[6,47,49]

Table 4 is a summary of compounds and analytes detected in the CLP analysis of the source samples. For each sampling location, a compound or analyte is listed if it was detected at least three times greater than the reference sample concentration. The background sample SS-05 concentrations are established as the reference concentrations. Compounds or analytes that occur at a concentration at least three times greater than the reference concentration are designated by their approximate relative value above the reference concentration. If the analyte or compound is not detected in the reference sample, the reference sample quantitation limit (SQL) (for organic analyses) or sample detection limit (SDL) (for inorganic analyses) is used as a reference value. Accordingly, compounds or analytes are listed by their approximate concentration above the SQL or SDL only if they occur at a value equal to or greater than the reference sample's SQL or SDL.

The complete analytical results of the CDM soil sampling activities, including quantitation and detection limits, are presented in Attachments A (Organic Soil and Sediment Analytical Results) and B (Inorganic Soil and Sediment Analytical Results). Sample results qualified with a "J" on the analytical tables are considered approximate because of limitations identified during the CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits, and confirmed by mass spectrometry, are also qualified by a "J" and are considered approximate.

TABLE 4

Summary of Analytical Results
Source Sample Analysis for
Rathe Brothers' Landfill

Sample Location No.	Compound/Analyte	Concentration (mg/kg)	Reference Concentration (mg/kg)	Comments
SS-02	Acetone	14 µg/kg	10U µg/kg	1.4 x SQL
	Barium	106	30.4	3.49 x REF
	Calcium	15,800	274	57.7 x REF
	Cobalt	27.8	5.5	5.1 x REF
	Iron	68,800	14,000	4.91 x REF
	Manganese	546J	150J	3.6 x REF
	Nickel	85.4	13.5	6.33 x REF
SS-03	Acetone	18J µg/kg	10U µg/kg	1.8 x SQL
	Antimony	6.8J	2.6UJ	2.6 x SDL
	Barium	115	30.4	3.78 x REF
	Calcium	13,400	274	48.9 x REF
	Cobalt	32.3	5.5	5.9 x REF
	Iron	78,000	14,000	5.6 x REF
	Manganese	573J	150J	3.8 x REF
	Nickel	106	13.5	7.85 x REF
	Potassium	1,010	301	3.36 x REF
	Zinc	103J	32.6J	3.15 x REF
SS-04	Calcium	11,100	274	40.5 x REF
	Magnesium	6,330	1,960	3.23 x REF
SS-06	Barium	378	30.4	12.4 x REF
	Calcium	20,400	274	74.5 x REF
	Iron	49,300	14,000	3.52 x REF
	Manganese	1,180J	150J	7.9 x REF
	Zinc	119J	32.6J	3.65 x REF

REF = Reference concentration
SDL = Sample Detection Limit
SQL = Sample Quantitation Limit
J = Quantitation approximate due to limitations identified in quality control review.
U = Indicates the sample was analyzed but not detected and reports the detection value.
UJ = The compound was not detected. The compound quantitation limit is an estimated value.
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram

Note: The precision of the entries in the "comments" column is governed by the rules of significant digits.

[47,49]

Analytical results indicate the presence of contaminants at levels greater than the SQL or SDL or exceeding three times the reference sample in surface soils at Rathe Brothers' Landfill, including VOCs and metals [47,49]. Source samples were collected in targeted areas of discolored soil or leachate. Acetone, the only VOC detected in source samples, was detected in one sample and its duplicate [47]. The origin of acetone is presumed to be the landfill; however, acetone is a common laboratory contaminant. Iron and manganese were detected above reference concentrations and have regularly been detected in high concentrations in the groundwater and surface water at the landfill [31,38]. In addition to the TCL substances detected, one additional VOC and several additional SVOCs were tentatively identified in the surface soil samples [47].

GROUNDWATER PATHWAY

Surficial materials in the landfill vicinity are mapped by the U.S. Soil Conservation Service as well drained deep lacustrine sands or loamy sands underlain in places by loamy sands, or loamy or clayey lacustrine materials. The Surficial Geologic Map of Vermont maps the area as predominantly pebbly marine sands [67].

The landfill site is located in the Champlain Valley, and the sandy soils at the site were probably formed as deltaic deposits during the glacial and post glacial marine invasion of The Champlain Lowlands [67].

The bedrock underlying the landfill site is mapped as the Monkton Formation, a distinctive red quartzite interbedded with buff colored dolomite. Just to the east of the landfill area, is the contact between the Monkton quartzite and the weathered buff, pink and gray dolomite of the Winooski formation. This outcrops on the south side of the landfill access road, just west of Route 7. During the site inspection a Monkton quartzite outcrop was noted along the unnamed tributary, just upstream from OB3. The quartzite of the Monkton formation is fairly massive and more resistant to weathering than the carbonaceous Winooski dolomite which can develop enlarged solution cavities and fractures [67].

A 1990 groundwater study performed by WH&N yielded additional information on the stratigraphy at the landfill. There is an interbedded dark brown to brown fine silty sand, approximately 20 to 25 feet thick at the ground surface. Below this layer is a blue-gray silt/clay layer varying from 30 to 100 feet thick. At one boring location, a green-gray silty clay was identified below the previous layer. Bedrock underlies all of these materials and at three boring locations was identified to be Monkton Quartzite [76].

Information available to CDM indicates that groundwater flow in the overburden in the northeast area of the landfill is in a north/northeast direction. Groundwater may recharge the unnamed tributary [31]. According to data supplied by WH&N, groundwater in the area of landfill section IV flows in a northwest direction [76]. Section IV is not adjacent to the unnamed tributary; therefore, the groundwater in this area is not as strongly affected by the tributary. Depth to groundwater beneath the landfill ranges from 5 to 40 feet bgs [31,76]. Depth to bedrock is 25 to 140 feet bgs, sloping to the northwest [31,76]. Bedrock configurations indicate that groundwater flow through bedrock would most likely be northwest [60,76].

Groundwater quality throughout Vermont, including in the vicinity of Rathe Brothers' Landfill, is class III [3]. Class III is defined as suitable for use as individual domestic water supplies [10].

There is one community groundwater system within a 4-mile radius of the landfill. J&W Water Supply serves 80 people with a 533 feet deep bedrock well, located approximately 2.75 miles northeast of the landfill [67,73]. Hillcrest Mobile Home Park is listed with the VTDEC Water Supply Division as a public water supply; however, its source of water is the Champlain Water District [17,73]. It is listed as a public water system because Hillcrest Mobile Home Park used to provide drinking water from its own well, and still maintains the infrastructure of the distribution system [17]. The nearest well to the landfill is the Rathe private well [26,72]. The Rathe bedrock well is about 1,500 feet south of the landfill [67]. The Avery garden well, sampled during the SI, is not used for drinking water. It is probably located in the Winooski formation and is reportedly 188 feet deep [67]. This well is located 2,500 feet east of the landfill [60,67]. An estimated 949 people are served drinking water from private wells within 4 miles of the landfill [26].

Much of the area surrounding the landfill is served drinking water by Colchester Fire Districts #2 and #3 [15,16]. The Fire Districts obtain water from the Champlain Water District. The surface water intake for the Champlain Water District, which serves several area towns, is located on Lake Champlain, approximately 13 miles downstream of the landfill [73]. Some residences to the north, northwest, and northeast of the landfill are not served by any municipal system and rely on private wells as a drinking water supply [16,18,72].

Table 5 summarizes information about the only public groundwater supply source within 4 miles of Rathe Brothers' Landfill.

TABLE 5

Public Groundwater Supply Sources within 4 Miles of Rathe Brothers' Landfill

Distance/ Direction from Property	Source Name	Location of Source	Estimated Population Served	Source Type
2.75 miles Northeast	J&W Water Supply	Colchester	80	Bedrock

[17,73]

Table 6 summarizes all drinking water populations served by groundwater sources located within each of the target distance rings within 4 miles of Rathe Brothers' Landfill. Frost Associates estimated the population served by private wells by summing the total number of drilled and dug wells within each CENTRACTS block (a Cartesian data management system used by the Census Bureau) and multiplying this total by the average number of people in each household. The Frost Associates report for Rathe Brothers' Landfill was used to estimate private drinking water populations within distance rings from the landfill. There are no residences, and therefore no private wells within 0.25 mile of the landfill [60]. Frost Associates reports that approximately 6 people are served by private wells within 0.25 mile [26]. The discrepancy between the Frost Associates report and the information known about nearby residences indicates a difference between the CENTRACTS data and the Cartesian system used by Frost Associates, and the radial system used to calculate the number of people within each ring. The private drinking water populations within 0.25 mile, as documented by Frost Associates, have therefore been added to the 0.25 to 0.50-mile distance ring. The nearest well is the well at the Rathe residence, located approximately 1,500 feet south of the landfill [72]. Approximately 1,029 people are served drinking water by groundwater sources within 4 miles of Rathe Brothers' Landfill [26,73]. Table 6 summarizes all drinking water populations served by groundwater sources within 4 miles.

TABLE 6

Estimated Drinking Water Populations Served by Groundwater Sources within 4 Miles of Rathe Brothers' Landfill

Radial Distance From Rathe Brothers' Landfill (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources Within the Ring
0.00 - 0.25	0	0	0
> 0.25 - 0.50	28	0	28
> 0.50 - 1.00	92	0	92
> 1.00 - 2.00	164	0	164
> 2.00 - 3.00	256	80	336
> 3.00 - 4.00	409	0	409
TOTAL	949	80	1,029

[26,73]

In August 1986, the SI performed by VTDEC Hazardous Materials Division included groundwater sampling and analysis for metals, VOCs, and SVOCs. Groundwater samples were collected from two bedrock background (residential) wells and overburden monitoring wells onsite. The monitoring well results indicated concentrations of cadmium, chromium, copper, lead, nickel, and zinc below groundwater standards. However, it cannot be determined if these concentrations were elevated above background concentrations because the "background" wells were screened in bedrock and therefore should not be compared to the overburden monitoring well samples. The monitoring well samples also revealed the presence of toluene, in addition to several other unidentified (non-EPA method 601/602) VOCs and (non-EPA method 625) SVOCs. The Rathe residence drinking water supply well results indicated the presence of no VOCs and only one SVOC, bis(2-ethylhexyl)phthalate (11 micrograms per liter [μg/l]). Another residential well, the Avery well, was sampled and indicated the presence of chloroform at 77 μg/l [67]. The Avery well is at a higher elevation than the landfill and is believed to be influenced by other sources of contamination, including Champlain Cable [67,77].

The 1990 WH&N study of groundwater conditions surrounding section IV of the landfill was used to establish base (pre-section IV development) conditions. Contaminants determined to be present in the overburden aquifer include 1,1,1-TCA, 1,1-DCA, trichlorofluoromethane, methylene chloride, PCE, trans-1,2-DCA, TCE, MTBE, and benzene. Toluene and xylene were detected in trace amounts in bedrock monitoring well WQ-6d. It was noted that many of the contaminants may be associated with the auto salvage operations, such as MTBE, a gasoline octane additive. Metals elevated above regional background levels, according to WH&N include antimony, cadmium, nickel, tin, and lead. All dissolved metals were present at concentrations below drinking water standards [76].

Post closure monitoring for the Rathe Brothers' Landfill (section III) include semi-annual sample collection at overburden wells OB3, MW-4S, MW-5S, MW-6S, MW-7S, and MW-8S. All samples are analyzed for 8 dissolved metals, COD, chloride, pH, conductivity, TOX, and EPA Method 8240 analytes (VOCs). Monitoring results compiled for the period of May 1990 to May 1994 show that shallow groundwater at the landfill exceeds drinking water standards for iron and manganese. Concentrations of lead, 1,1-DCA, and methylene chloride exceed groundwater standards, and 1,1-DCA and methylene chloride also exceed Vermont Health Advisories for drinking water. Releases to groundwater were also observed for arsenic, zinc, 1,1,1-TCA, trichlorofluoromethane, MTBE, chloroform, and acetone [31].

Post closure monitoring for the Burlington (section IV) portion of the landfill include some overburden wells and two bedrock monitoring wells. Observed releases in the bedrock aquifer since 1992 include iron, manganese, zinc, mercury, phenol, and copper [38].

On October 5 and 6, 1994, CDM collected groundwater samples from monitoring wells at Rathe Brothers' Landfill (see Figure 4), two tap water samples from wells on the property, and six tap water samples at nearby residential wells (see Figure 5) [6]. A summary of all groundwater samples collected by CDM is shown in Table 7. Figures 4 and 5 show the approximate sample locations. All groundwater samples were submitted for analysis of VOCs, SVOCs, pesticides/PCBs, metals, and cyanide, by low concentration methods via CDM's DAS with the exception of GW-01, for which only enough sample could be obtained for VOC and SVOC analysis [6].

GW-01 was obtained from a bedrock monitoring well identified as WQ-8d. This 2-inch well is drilled into bedrock to a depth of 35.9 feet; there is a 10-foot well screen in the bedrock. Depth to bedrock at this location is 25 feet. GW-02 and GW-03 (duplicate) were obtained from a bedrock monitoring well identified as WQ-6d. This 2-inch well is drilled into bedrock to a depth of 130 feet bgs. Depth to bedrock is 122.4 feet bgs. The well screen is 5 feet long [75].

The reference well is the Rathe residential well which is presumed to be hydraulically upgradient [60]. This well was installed by Feeley & Sons for Rathe Brothers on July 20, 1961. It was drilled to a depth of 202 feet [6]. It is believed to be near the mapped contact between the two bedrock formations (Monkton (red) quartzite and Winooski (pink) dolomite) [67]. No further information is available on this well.

GW-11 was collected from the auto salvage yard garage near the landfill [6]. This well was reportedly drilled into hard red rock, to a depth of 95 feet bgs [74]. During redrilling to deepen the well in 1993, groundwater was encountered at 30 feet bgs. This well is not used for drinking water [6,74]. The screened interval of this well is not documented [74].

The tap water sample GW-05 was collected from a well that was installed around 1970 and is reportedly drilled into bedrock to a depth of 98 feet bgs [53,72]. This well serves five people [53]. The bedrock well at location GW-06 was drilled to 102 feet bgs, reportedly around 1975 [28,72]. This well serves seven people [28]. At GW-07, the well is reportedly 120 feet bgs, and was installed in approximately 1970 [7]. This well serves two people [7]. The distance to these wells from the landfill is approximately 0.6 mile [60]. Well logs for these wells were not obtained by CDM.

CDM obtained the well logs for the following wells. The well from which GW-08 was obtained was installed in 1992 to a depth of 224 bgs. The well reportedly finishes in red limestone [74]. Distance to the landfill from GW-08 is 0.8 mile [60]. This well serves two people [21]. The tap water sample GW-09 was collected from a well that is drilled to 192 feet deep bgs, and is screened in heavily fractured pink limestone. The distance from the landfill is 0.9 mile [60]. This well, serving three people, was installed in 1992 [52,74]. At GW-10, the well was installed in 1987 to a depth of 323 feet bgs, finishing in red limestone [74]. The distance between GW-10 and the landfill is 0.9 mile [60]. This well serves five people [51]. The screened intervals for these wells are not documented [74].

Collection of all tap water samples was completed on October 6, 1994. Most were collected from outdoor taps, while a few were collected from indoor taps. CDM field team let the water run for 15 to 30 minutes to empty the holding tanks to ensure that the samples were collected from the water table. None of the samples were filtered. One sample was collected from a continuously overflowing wellhead [6].

TABLE 7

Sample Summary: Rathe Brothers' Landfill
Groundwater Samples Collected by CDM on October 5 and 6, 1994

Sample Location No.	CDM Sample #/ Traffic Report #	Date/ Time (hrs)	Remarks/ Sample Depth	Sample Source
GW-01	DAC140 (O)	10/5 1445 (VOA) 10/6 1030 (BNA)	Grab	Onsite monitoring well previously identified as WQ-8d; screened in bedrock.
GW-02	DAC141 (I&O)	10/5 1300	Grab	Onsite monitoring well previously identified as WQ-6d; screened in bedrock.
GW-03	DAC142 (I&O)	10/5 1300	Grab	Duplicate of GW-02 for QC.
GW-04	DAC143 (I&O)	10/6 1120	Grab	Rathe residential well on landfill property (approximately 400 yards south of landfill); sample obtained from garage tap.
GW-05	DAC144 (I&O)	10/6 1345	Grab	Residential well at 82 Mallett's Bay Avenue; sample obtained from kitchen tap.
GW-06	DAC145 (I&O)	10/6 0705	Grab	Residential well at 84 Mallett's Bay Avenue; sample obtained from tap in garage.
GW-07	DAC146 (I&O)	10/6 1300	Grab	Residential well at 92 Mallett's Bay Avenue; sample obtained from well overflow.
GW-08	DAC147 (I&O)	10/6 0945	Grab	Residential well at 127 Blakely Road; obtained from tap in basement.
GW-09	DAC148 (I&O)	10/6 1230	Grab	Residential well at 136 Blakely Road; sample obtained from well shut off in backyard.
GW-10	DAC149 (I&O)	10/6 0745	Grab	Residential well at 38 Blakely Road; sample obtained from tap on east side of house.

TABLE 7 (continued)

Sample Location No.	CDM Sample #/ Traffic Report #	Date/ Time (hrs)	Remarks/ Sample Depth	Sample Source
GW-11	DAC157 (I&O)	10/6 1430	Grab	Non-drinking water supply well at Rathe Salvage office/garage; sample obtained from tap in garage.

I = Inorganic
O = Organic
BNA = Base/Neutral/Acid Extractables
VOA = Volatile Organic Analysis

[6,48,50]

Table 8 is a summary of compounds and analytes detected in the analyses of the groundwater samples. For each sample, a compound or analyte is listed if it was detected at least three times greater than the reference sample concentration. The background sample GW-04 concentrations are established as the reference concentrations. Compounds or analytes that occur at a concentration at least three times greater than the reference sample concentration are designated by their approximate relative value above the reference sample concentration. If the analyte or compound is not detected in the reference sample, the reference SQL or SDL is used as a reference value. Accordingly, compounds or analytes are listed by their approximate concentration above the SQL or SDL only if they occur at a value equal to or greater than the reference sample's SQL or SDL.

The complete analytical results of the CDM sampling activities, including SQLs and SDLs, are presented in Attachment C (Organic Groundwater Sample Analytical Results) and Attachment D (Inorganic Groundwater Sample Analytical Results). Sample results qualified with a "J" on the analytical tables are considered approximate because of limitations identified during the CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits, and confirmed by mass spectrometry, are also qualified by a "J" and are considered approximate.

TABLE 8

Summary of Analytical Results
Groundwater Sample Analysis for
Rathe Brothers' Landfill

Sample Location No.	Compound/Element	Concentration (μg/l)	Reference Concentration (μg/l)	MCL	Comments
GW-01	Dichlorodifluoromethane	1.4J	1UJ	NE	1.4 x SQL
GW-02	Aluminum	3,970	28.4U	NE	140 x SDL
	Chromium	9.4	3.7U	100	2.5 x SDL
	Iron	7,220	54.4U	NE	133 x SDL
	Manganese	315	1.7U	NE	185 x SDL
	Vanadium	5.4J	3.7U	NE	1.5 x SDL
GW-03	bis(2-Ethylhexyl)phthalate	8.4J	5U	NE	1.7 x SQL
	Aluminum	4,170	28.4U	NE	147 x SDL
	Chromium	20.1	3.7U	100	5.4 x SDL
	Iron	7,330	54.4U	NE	135 x SDL
	Manganese	300	1.7U	NE	18 x SDL
	Nickel	27.8J	16.7U	100	1.66 x SDL
	Vanadium	7.9	3.7U	NE	2.1 x SDL
GW-05	Lead	0.94	0.90U	15**	1.0 x SDL
GW-06	Iron	277	54.4U	NE	5.09 x SDL
GW-08	bis(2-Ethylhexyl)phthalate	44	5U	NE	8.8 x SQL
	Iron	1,410	54.4U	NE	25.9 x SDL
	Lead	1.6	0.90U	15**	1.8 x SDL
	Manganese	106	1.7U	NE	62 x SDL
GW-09	Iron	311	54.4U	NE	5.72 x SDL
	Manganese	162	1.7U	NE	95 x SDL
GW-10	Iron	551	54.4U	NE	10.1 x SDL
GW-11	Dichlorodifluoromethane	11J	1UJ	NE	11 x SQL
	Iron	323	54.4U	NE	5.94 x SDL
	Manganese	548	1.7U	NE	320 x SDL

MCL = Maximum Contaminant Level
REF = Reference concentration
SDL = Sample Detection Limit
SQL = Sample Quantitation Limit
J = Quantitation approximate due to limitations identified in quality control review
U = Indicates the sample was analyzed but not detected and reports the detection value
UJ = The compound was not detected. The compound quantitation limit is an estimated value.
μg/l = Micrograms per liter
NE = None established
** = Action Level

Note: The precision of the entries in the "comments" column is governed by the rules of significant digits.

[48,50,57]

Analytical results indicate the presence of contaminants at levels greater than the SQL or SDL or exceeding three times the reference sample in groundwater samples collected at Rathe Brothers' Landfill monitoring wells (GW-01 though GW-03) and an onsite water supply well (GW-11). Contaminants detected above reference concentrations in samples from the onsite wells include one VOC (dichlorodifluoromethane), one SVOC (bis(2-ethylhexyl)phthalate), and metals [48,50]. Neither the VOC or the SVOC was detected in source samples collected by CDM. Of the seven metals detected above reference concentrations, iron, manganese, and nickel were detected in CDM source samples and aluminum, chromium, lead, and vanadium were not detected in source samples [48]. Iron and manganese were detected above reference concentrations and have regularly been detected in high concentrations in the groundwater at the landfill [31,38]. Iron and manganese concentrations detected during sampling by WH&N at the landfill have been reported to be similar to concentrations detected at other sites with similar geologic conditions [76].

None of the contaminants detected in the onsite wells were at concentrations exceeding Maximum Contaminant Levels (MCLs) [48,50,57]. Concentrations of contaminants in the monitoring well and onsite tap water (non-drinking) samples exceeded some Secondary MCLs (SMCLs) (given in parentheses), including aluminum (50 μg/l), iron (300 μg/L), and manganese (50 μg/l). Dichlorodifluoromethane detected in GW-01 was above the EPA Lifetime Health Advisory of 1,000 μg/l [48,50,57]. In addition to the substances listed in Table 8, some additional SVOCs were tentatively identified in the onsite well samples [50]. The number of tentatively identified compounds associated with each sample are given in parentheses: GW-01 (4), GW-02 (11), GW-03 (9), and GW-11 (1) [50].

Analytical results indicate the presence of contaminants at levels greater than the SQL or SDL or exceeding three times the reference sample in groundwater samples collected at residential taps west, north, and northwest of the landfill (GW-05 through GW-10). These contaminants include bis(2-ethylhexyl)phthalate, dichlorodifluoromethane, iron, lead, and manganese [48,50]. While all the wells sampled are drilled into bedrock, it is not clear whether they are drilled into the same type of bedrock [72,74]. Differences in the composition of the bedrock that the wells are drilled into might cause differences in the naturally occurring concentrations of metals in the groundwater. Lead, detected in two samples, could be present in the tap water due to lead pipes in the water supply distribution systems [48].

None of the contaminants detected in tap water samples were at concentrations exceeding MCLs [48,50,57,64]. Lead concentrations detected in GW-05 and GW-08 were below the EPA lead action level. The SMCL for iron (300 μg/l) was exceeded in GW-08, GW-09, and GW-10. Concentrations of manganese detected in GW-08 and GW-09 were above the 50 μg/l SMCL. Bis(2-ethylhexyl)phthalate was detected in GW-08; however, there is no MCL to compare to the detected concentration. Additionally, substances that were detected in tap water samples, but not at concentrations more than three times the reference sample, include barium and sodium. The concentrations of barium and sodium detected are well below the 2,000 μg/l MCL, and 250,000 μg/l SMCL, respectively [48,50,57,64]. In addition to the substances listed in Table 8, four additional SVOCs were tentatively identified in tap water sample GW-05 [50].

Substances detected in the reference sample (GW-04) include: antimony (1 μg/l), barium (34.5 μg/l), and sodium (120,000 μg/l). These concentrations are compared to 6 μg/l (MCL), 2,000 μg/l (MCL), and 20,000 μg/l (EPA Health Advisory) [48,50,57,64].

On March 6, 1995, the VTDEC Hazardous Materials Management Division resampled the well at 127 Blakely Road (CDM sample GW-08). The sample was analyzed for VOCs by EPA Method 8260 and SVOCs by EPA Method 8270. No VOCs or SVOCs were detected above detection limits, including bis(2-ethyl hexyl) phthalate with a detection limit of 10 mg/l) [11].

SURFACE WATER PATHWAY

Overland flow from the northeast section of Rathe Brothers' Landfill drains toward the unnamed tributary bordering the landfill area to the north and east. The overland flow path to the most upstream probable point of entry (PPE) is approximately 50 feet [6]. The unnamed tributary flows to Sunderland Brook, located 0.2 mile north of the landfill. Sunderland Brook flows approximately 1.8 miles west and south to the Winooski River. The Winooski River discharges to Lake Champlain, approximately 7 miles downstream. The remainder of the 15-mile downstream pathway is in Lake Champlain on a 6-mile arc from the mouth of the Winooski River [62,63]. Overland flow from the western portions of the property and landfill flow toward a drainage ditch bordering the landfill to the west. This drainage ditch eventually flows through a culvert under Route 89. The discharge point of this culvert is unknown; the land on the opposite side of Route 89 is in the drainage basin of Sunderland Brook and the Winooski River. The length of the overland flow path would be approximately 0.6 mile [6,60]. The Rathe Brothers' Landfill is outside the 500-year floodplain [23].

Surface water quality classification for the unnamed tributary, Sunderland Brook, and the Winooski River within the 15-mile pathway is all class B. Class B waters are targeted to achieve and maintain a high level of quality for aesthetics and aquatic habitats, as well as to be used as a public water supply with filtration and disinfection, swimming, and recreation. Lake Champlain, within the 15-mile pathway, is also class B [66]. The Winooski River and Lake Champlain are used for all types of recreation [65,67].

Table 9 lists the water bodies that are located on the 15-mile downstream pathway. Flow rates have been estimated for all water bodies in the downstream pathway. The unnamed tributary and Sunderland Brook are estimated to be less than 10 cubic feet per second (cfs); no gauging has occurred on these two water bodies [6,54]. The Winooski River has a gauging station at a point 7.5 miles upstream; the Winooski River at this gauging station has an annual mean flow of 1,723 cfs [54]. Therefore, the flow rate in the Winooski River portion of the 15-mile downstream pathway is greater than 1,723 cfs. An estimated flow rate of Lake Champlain near the mouth of the Winooski River was calculated using an estimated watershed area. The flow in Lake Champlain may at times be greater than 10,000 cfs, but the annual mean flow is estimated to be approximately 4,000 cfs [14].

TABLE 9

Water Bodies within the Surface Water Segment of Rathe Brothers' Landfill

Surface Water Body	Descriptor[a]	Length of Reach	Flow Characteristics (cfs)[b]	Length of Wetlands
Unnamed tributary	Minimal stream	0.2 mile	<10	none
Sunderland Brook	Minimal stream	1.8 miles	<10	0.6 mile
Winooski River	Moderate to large stream	7 miles	>1,723	6.3 miles
Lake Champlain	Lake	6 miles	≈ 4,000	2.4 miles

[a] Minimal stream. Small to moderate stream. Moderate to large stream. Large stream to river. Very large river. Coastal tidal waters. Shallow ocean zone or Great Lake. Deep ocean zone or Great Lake. Three-mile mixing zone in quiet flowing river.

[b] Cubic feet per second.

[6,14,54,56]

Lake Champlain is used to supply drinking water to the city of Burlington, Vermont, and to the Champlain Water District. The city of Burlington serves a population of 47,600 and sells water to the Champlain Water District, which serves many surrounding towns, including Colchester. The Champlain Water District reportedly serves drinking water to a population of 55,000 [73]. The location of the Burlington water intake is located just off the shore of Burlington, within the 15-mile surface water pathway. The downstream distance to the Burlington water intake is approximately 13 miles [60,73]. Table 10 summarizes information about the only drinking water intake along the 15-mile downstream pathway.

TABLE 10

Drinking Water Intakes Along the 15-Mile Downstream Pathway From Rathe Brothers' Landfill

Intake Name	Water Body	Downstream Distance From PPE	Flow Rate at Intake	Estimated Population Served
Burlington Water Reservoir	Lake Champlain	≈ 13 miles	≈ 4,000 cfs	102,600

[14,73]

Sunderland Brook is a small stream with a small number of fish species and no known use as a fishery [13]. The Winooski River and Lake Champlain are active fisheries [13,67]. The closest designated fishery is 8 miles downstream from the most upstream PPE, at an area of state-owned land known as Half Moon Cove [13,61]. However, the entire length of the Winooski River may be used for fishing activity, and locations used by fisherman vary seasonally [13]. Winooski River fish species include bullhead, stocked Atlantic salmon, brown trout, steelhead trout (all spring species), and walleye (early summer species). Lake trout are found year-round in Lake Champlain and the lower Winooski River. Other year-round species in the lake and the river include northern pike, large- and smallmouth bass, yellow and white perch, and black crappie [13]. The Half Moon Cove area, and a large area of state-owned land along the Winooski River, is used for waterfowl preserve and hunting activities [13].

Along the 15-mile downstream pathway are habitats for three state designated threatened species [13,40]. One of these species' habitat is the Sunderland Brook [13]. One of these species is also currently under review for listing as a federally designated endangered or threatened species [40].

There are 9.3 miles of wetland frontage on the 15-mile surface water pathway. The closest wetlands to the landfill are those located on the Sunderland Brook; these wetlands are 0.2 mile from the most upstream PPE [56,60,61].

The 1987 SI, completed by VTDEC, included the collection of tributary surface water and sediment samples from midstream (SS-MIDA and a duplicate, SS-MIDB) and downstream (SS-DOWN), which showed concentrations of copper, nickel, lead, mercury, and zinc that were significantly (more than three times) larger than those observed at the upstream location (SS-UP) (see Figure 2). No VOCs were detected in the surface water samples. No SVOCs were detected in the sediment samples except one unidentified (non-EPA method 625) compound detected at SS-MID [67].

Post-closure monitoring of the landfill as regulated by VTDEC includes surface water sampling in the unnamed tributary at two locations upstream (SS-4) and downstream (SS-3) of the landfill (see Figure 2). Since 1990, the only contaminant showing an increase downstream over upstream concentrations is iron, although both iron and manganese concentrations in the stream exceed drinking water standards [31]. It should be noted that the "upstream" sampling location (SS-4), as identified by the Hamlin Engineers consultants on the day of the reconnaissance, is not actually upstream of the full extent of landfill. SS-4 is collected at approximately the midstream location sampled by the VTDEC in 1987 [6].

On October 5, 1994, CDM collected sediment samples from the unnamed tributary bordering the Rathe Brothers' Landfill [6]. A summary of all sediment samples collected by CDM is shown in Table 11. All samples were collected at a depth of 0 to 8 inches, except SD-07 and SD-08, which were collected at a depth of 0 to 10 inches. One background sample (SD-01), which is presumed to be unaffected by the landfill, was collected from the unnamed tributary, upstream of the landfill [6]. Figures 4 and 5 show the approximate sample locations. All samples were analyzed for full TCL and TAL analyses through EPA CLP.

TABLE 11

Sample Summary: Rathe Brothers' Landfill
Sediment Samples Collected by CDM on October 5, 1994

Sample Location No.	CDM Sample #/ Traffic Report #	Time (hrs)	Remarks/ Sample Depth	Sample Source
SD-01	MAFJ55 (I) AHY37 (O)	1815	Grab/0-8 inches/brown silty fine sand	Background sample collected upstream of landfill and dirt road in southeastern corner of the property.
SD-02	MAFJ56 (I) AHY38 (O)	1800	Grab/0-8 inches/gray silty clay with trace fine sand	Approximately 30 feet downstream of dirt road in southeastern corner of property.
SD-03	MAFJ57 (I) AHK39 (O)	1700	Grab/0-8 inches/orange and brown silty very fine sand with little fine sand	Approximately 40 feet downstream of waterfall and VTDEC/Rathe surface water monitoring location; Downstream of SS-06 and steep drainage path from landfill.
SD-04	MAFJ63 (I) AHY45 (O)	1340	Grab/0-8 inches/gray sand with silt and clay	Approximately 10 feet downstream of steep runoff pathway from landfill; in vicinity of sharp bend in tributary around the northeast corner of the landfill.
SD-05	MAFJ59 (I) AHY41 (O)	1300	Grab/0-8 inches/grayish brown silty very fine sand, some organics	Approximately 15 feet downstream of steep runoff pathway from landfill; in northwest corner of landfill; at approximate location of state required surface water monitoring location.
SD-06	MAFJ60 (I) AHY42 (O)	1300	Same as SD-05	Duplicate of SD-05 for QC.
SD-07	MAFJ61 (I) AHY43 (O)	1230	Grab/0-10 inches/grayish brown silty very fine sand, some streaks of orange, brown, and black	Approximately 12 feet upstream of barbed wire fence that runs parallel to Rte. 89; upstream of pipe draining from Rte. 89; in vicinity of Rathe/Canedy property line

TABLE 11 (continued)

Sample Location No.	CDM Sample #/ Traffic Report #	Time (hrs)	Remarks/ Sample Depth	Sample Source
SD-08	MAFJ62 (I) AHY44 (O)	1145	Grab/0-10 inches/ grayish brown silty very fine sand with some darker streaks	Approximately 200 feet north of Rathe/Canedy property line; estimated to be just south of Munson property.

I = Inorganic
O = Organic

[6,47,49]

Table 12 is a summary of compounds and analytes detected in the CLP analysis of the sediment samples. For each sampling location, a compound or analyte is listed if it was detected at least three times greater than the reference sample concentration. The background sample SD-01 concentrations are established as the reference concentrations. Compounds or analytes that occur at a concentration at least three times greater than the reference sample concentration (sample location SD-01) are designated by their approximate relative value above the reference sample concentration. If the analyte or compound is not detected in the reference sample, the reference SQL or SDL is used as a reference value. Accordingly, compounds or analytes are listed by their approximate concentration above the SQL or SDL only if they occur at a value equal to or greater than the reference sample's SQL or SDL.

The complete analytical results of the CDM sampling activities, including SQLs and SDLs, are presented in Attachments A and B. Sample results qualified with a "J" on the analytical tables are considered approximate because of limitations identified during the CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits, and confirmed by mass spectrometry, are also qualified by a "J" and are considered approximate.

TABLE 12

Summary of Analytical Results
Sediment Sample Analysis for
Rathe Brothers' Landfill

Sample Location No.	Compound/Analyte	Concentration (mg/kg)	Reference Concentration (mg/kg)	Comments
SD-02	Aluminum	12,200	3,470	3.52 x REF
	Barium	46.3	14.8	3.13 x REF
	Chromium	23.4	7.2	3.25 x REF
	Copper	28.2	6.1	4.6 x REF
	Iron	29,600	9,740	3.04 x REF
	Magnesium	8,570	1,920	4.46 x REF
	Manganese	988 J	274 J	3.61 x REF
	Nickel	39.1	11.2	3.49 x REF
	Potassium	1,660	316	5.25 x REF
SD-03	Calcium	15,000	1,660	9.04 x REF
	Magnesium	9,390	1,920	4.89 x REF
SD-04	Acetone	32 µg/kg	12U µg/kg	2.7 x SQL
SD-07	Acetone	22 µg/kg	12U µg/kg	1.8 x SQL
	4,4'-DDT	7.3 µg/kg	42U µg/kg	1.7 x SQL

REF = Reference concentration
SQL = Sample Quantitation Limit
J = Quantitation approximate due to limitations identified in quality control review.
U = Indicates the sample was analyzed but not detected and reports the detection value.
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram

Note: Acetone was detected in the background sample at an estimated concentration (11J) below the SQL (12U). The SQL (12U) is reported in the above table and is used for comparison to the release substances.

The precision of the entries in the "comments" column is governed by the rules of significant digits.

[6,47,49]

Analytical results indicate the presence of contaminants at levels greater than the SQL or SDL or exceeding three times the reference sample in sediment samples collected from the unnamed tributary at Rathe Brothers' Landfill. Contaminants detected above background concentrations include one VOC (acetone), one pesticide (4,4'-DDT), and metals [47,49]. Acetone was detected in source samples detected by CDM, but is also a common laboratory contaminant [47]. Acetone was not detected in groundwater samples collected by CDM but has previously been detected in overburden groundwater at the landfill [31]. 4,4'-DDT was not detected in source samples collected by CDM at the landfill [47]. The presence of 4,4'-DDT in sample SD-07 is likely from routine application of pesticides in the area prior to 1972. In 1972, EPA banned the use of pesticides; however, due to their persistent nature, they may still be present at low concentrations. Of the 10 metals detected in sediments above background concentrations, barium, calcium, iron, magnesium, manganese, nickel, and potassium were detected in CDM source samples. Aluminum, chromium, and copper were not detected in source samples [49]. In addition to the TCL substances detected, one additional VOC and several additional SVOCs were tentatively identified in the sediment samples [47].

SOIL EXPOSURE PATHWAY

The landfill (both sections III and IV) has a vegetated cover with a minimum thickness of 2 feet [6,22,30]. With the exception of a few areas of leachate observed surrounding the landfill, the cover material has been observed by CDM field personnel to be in good condition [6]. CDM performed sampling of surficial soils in leachate areas (see Figure 4). Results of these samples are reported in Table 4 in the Waste/Source Sampling section. Contaminants detected in surficial soil samples include acetone, antimony, barium, calcium, cobalt, iron, magnesium, manganese, nickel, potassium and zinc [47,49]. No soil sampling occurred during the 1987 SI [67].

While there may be some areas of contaminated soil associated with the auto salvage yard activities, no specific areas of concern have been identified. The salvage yard operator is not aware of any automotive fluid spills that have occurred on the property [20].

Rathe Brothers' Four, Inc. employs five people onsite, associated with salvage yard activities [6]. The Rathe family residence is on the property but is approximately 1,500 feet from the landfill [60]. No schools or day-care facilities are on the property or within 200 feet from any area of observed contamination [47,49,60]. No terrestrial sensitive environments are known to be on the property. An estimated 1,650 people live within a 1-mile radius of the landfill [26]. Access to the landfill and salvage yard is restricted by a combination of gates and natural barriers, except during the salvage yard hours of operation [6,60].

AIR PATHWAY

The nearest individuals to the Rathe Brothers' Landfill are the employees who work at the auto salvage yard, on and around the landfill [6]. Population within 4 miles of the property is estimated to be 58,872 [26]. No sensitive environments have been identified onsite. Sensitive environments within 4 miles of the property include more than 1,500 acres of wetlands [56]. Additionally, within a 4-mile radius of Rathe Brothers' Landfill, there are habitats for 15 state designated threatened species and five state designated endangered species [13,40]. CDM did not document the number of people attending schools or working within 4 miles of Rathe Brothers' Landfill. The nearest school is 1 mile northwest; the enrollment of this school is unknown [60].

Table 13 presents the residential population within 4 miles of the property by distance ring.

TABLE 13

Estimated Population within 4 Miles of Rathe Brothers' Landfill

Radial Distance From Rathe Brothers' Landfill (miles)	Estimated Population
0.00 - 0.25	137
> 0.25 - 0.50	358
> 0.50 - 1.00	1,155
> 1.00 - 2.00	9,935
> 2.00 - 3.00	23,185
> 3.00 - 4.00	24,102
TOTAL	58,872

[26]

No air sampling was conducted at the Rathe Brothers' Landfill in conjunction with this SIP. While conducting field activities, CDM monitored ambient air quality using an organic vapor monitor (OVM). During the onsite reconnaissance and the sampling event, the OVM did not register any organic vapor concentrations above background (0 ppm) [6].

SUMMARY

Rathe Brothers' Landfill, located in Colchester, Vermont, operated from 1967 to January 1992. The 112-acre property, including the 13-acre landfill, is owned by Rathe Brothers' Inc. and operated by Louis and Lawrence Rathe. The landfill is currently inactive, and all sections are capped with a minimum of 2 feet cover material. Rathe Brothers' Four, Inc. currently operates an auto salvage yard on the property.

Wastes accepted at the landfill included municipal, commercial, and industrial wastes. Over the years of operation, the Rathe Brothers' Landfill accepted small amounts of petroleum contaminated soils and asbestos wastes, as approved by the Vermont Department of Environmental Conservation (VTDEC), Solid Waste Division. From 1971 to 1972 an estimated 7,000 gallons of trichloroethylene, cadmium, chromium and lead wastes were disposed of at the Rathe Landfill by General Electric. From 1967 to 1979, Lavallee and Roy, Inc., a metal cutting tools manufacturer, took approximately 5 gallons per week spent mineral spirits and one or two 55-gallon drums of cutting oil sludge per week to the Rathe Landfill. The Rathes have stated that, while they did accept wastes from Lavallee and Roy, Inc., they deny accepting any drums of hazardous waste or drums with unknown contents from General Electric or any other firm.

In 1987, the VTDEC Hazardous Materials Division completed a Superfund Site Inspection of the Rathe Brothers' Landfill. Groundwater and surface water samples were collected and analyzed for metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs). Metals, VOCs, and SVOCs were detected in surface water, sediment, and groundwater samples.

In 1989, Rathe Brothers, Inc. made an agreement to lease one landfill section to the town of Colchester for solid waste disposal and to lease another landfill section to the city of Burlington, Vermont, for the construction and operation of a new lined landfill. The Colchester section operated from November 1989 to January 1992. The Burlington section operated from January 1990 to January 1992.

CDM performed a reconnaissance of the property in August 1994. The landfill caps were intact and well vegetated. One leachate outbreak was observed in the southeastern corner of landfill section IIIA. On October 5 and 6, 1994, CDM field personnel collected five surface soil samples, seven sediment samples, three monitoring well samples, and two tap water samples from the Rathe Brothers' Landfill property. Additionally, one sediment sample was collected from a property located northwest of the landfill, and six tap water samples were collected from nearby residences. All sediment and soil samples were submitted for full Target Compound List and Target Analyte List analysis through the EPA Contract Laboratory Program Routine Analytical Services. All groundwater samples were submitted for analysis of VOCs, SVOCs, pesticides/polychlorinated biphenyls (PCBs), metals, and cyanide, by low concentration methods via CDM's Delivery of Analytical Services, with the exception of GW-01, for which only enough sample could be obtained for VOC and SVOC analysis.

Analytical results indicate the presence of contaminants in surface soils at significant concentrations at Rathe Brothers' Landfill, including VOCs and metals. Source samples were collected in targeted areas of discolored soil or leachate. Groundwater samples collected from onsite tap (non-drinking water) or onsite monitoring wells showed the presence of one VOC (dichlorodifluoromethane), one SVOC (bis(2-ethylhexyl)phthalate), and metals. None of the

contaminants detected in the onsite wells were at concentrations exceeding Maximum Contaminant Levels (MCLs). Concentrations of contaminants in the monitoring well and onsite tap water sample exceeded some Secondary MCLs (given in parentheses), including aluminum (50 micrograms per liter (μg/l)), iron (300 μg/l), and manganese (50 μg/l). Dichlorodifluoromethane detected in GW-01 was above the EPA Lifetime Health Advisory of 1,000 μg/l. Nearby tap water samples showed the presence of contaminants including bis(2-ethylhexyl)phthalate, dichlorodifluoromethane, iron, lead, and manganese. None of the contaminants detected in tap water samples were at concentrations exceeding MCLs. Lead concentrations detected were below the EPA lead action level. The SMCL for iron (300 μg/l) was exceeded in three tap water samples. Concentrations of manganese detected in two samples were above the 50 μg/l SMCL. Analytical results of sediment sampling performed by CDM indicate the presence of contaminants, including acetone, 4,4'-DDT, and metals.

There is one community groundwater system within a 4-mile radius of the landfill. J & W Water Supply serves 80 people with a bedrock well located approximately 2.75 miles northeast of the landfill. The nearest well to the landfill is the Rathe private well. The Rathe bedrock well is about 1,500 feet south of the landfill. An estimated 949 people are served drinking water from private wells within 4 miles of the landfill.

Overland flow from the Rathe Brothers' Landfill primarily drains toward the unnamed tributary bordering the landfill to the north and east. The unnamed tributary flows to Sunderland Brook, located 0.2 mile north of the landfill. Sunderland Brook flows approximately 1.8 miles west and south to the Winooski River. The Winooski River discharges to Lake Champlain, approximately 7 miles downstream. The remainder of the 15-mile downstream pathway is in Lake Champlain on a 6-mile arc from the mouth of the Winooski River.

Lake Champlain is used to supply drinking water to the city of Burlington, Vermont, and to the Champlain Water District. The city of Burlington serves a population of 47,600 and sells water to the Champlain Water District, which serves a population of 55,000. The downstream distance from the probable point of entry (PPE) to the Burlington water intake is approximately 13 miles. The Winooski River and Lake Champlain are active fisheries. The closest designated fishery is 8 miles downstream from the most upstream PPE. Along the 15-mile downstream pathway, there are habitats for three state designated threatened species, including one that is currently under review for listing as a federally designated endangered or threatened species. There are 9.3 miles of wetland frontage on the 15-mile surface water pathway.

Rathe Brothers' Four, Inc. employs five people onsite, associated with the salvage yard. The Rathe family residence is on the property, approximately 1,500 feet from the landfill. No schools or day-care facilities are on the property or within 200 feet from any area of observed contamination. No terrestrial sensitive environments are known to be on the property. An estimated 1,650 people live within a 1-mile radius of the landfill. Access to the landfill and salvage yard is restricted by a combination of gates and natural barriers, except during the salvage yard hours of operation.

Population within 4 miles of the property is estimated to be 58,872. No sensitive environments have been identified onsite. Sensitive environments within 4 miles of the property include more than 1,500 acres of wetlands and habitats for 15 state designated threatened species and 5 endangered species.

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ATTACHMENT A

RATHE BROTHERS' LANDFILL

ORGANIC SOIL AND SEDIMENT SAMPLE ANALYTICAL RESULTS
CDM FEDERAL PROGRAMS CORPORATION

OCTOBER 5, 1994
(sampling date)

CASE NO: 22742
SDG NO: AHY37

SITE: RATHE BROS. LANDFILL COLCHESTER, VT
LABORATORY: RECRA ENVIRONMENTAL

EPA SAMPLE NUMBER:	AHY49	AHY50	AHY51		
SAMPLE LOCATION:	EB-SS	EB-SD	TB-01		
LABORATORY SAMPLE NUMBER:	A4540312	A4540313	A4540314		
SAMPLE TYPE:	Equipment Blank	Equipment Blank	Equipment Blank		
MATRIX/ANALYSIS:	WATER/LOW	WATER/LOW	WATER/LOW		
DILUTION FACTOR:	1.0/	1.0/	1.0/		
DATE SAMPLED:	10/05/94	10/05/94	10/05/94		
DATE ANALYZED:	10/11/94	10/11/94	10/10/94		
PERCENT SOLID:	0	0	0		
VOA					
Chloromethane	10 U	10 U	10 U		
Bromomethane	10 U	10 U	10 U		
Vinyl Chloride	10 U	10 U	10 U		
Chloroethane	10 U	10 U	10 U		
Methylene Chloride	10 U	10 U	10 U		
Acetone	10 U	10 U	10 U		
Carbon Disulfide	10 U	10 U	10 U		
1,1-Dichloroethene	10 U	10 U	10 U		
1,1-Dichloroethane	10 U	10 U	10 U		
1,2-Dichloroethene (total)	10 U	10 U	10 U		
Chloroform	10 U	10 U	10 U		
1,2-Dichloroethane	10 U	10 U	10 U		
2-Butanone	20 U	16 U	28 U		
1,1,1-Trichloroethane	10 U	10 U	10 U		
Carbon Tetrachloride	10 U	10 U	10 U		
Bromodichloromethane	10 U	10 U	10 U		
1,2-Dichloropropane	10 U	10 U	10 U		
cis-1,3-Dichloropropene	10 U	10 U	10 U		
Trichloroethene	10 U	10 U	10 U		
Dibromochloromethane	10 U	10 U	10 U		
1,1,2-Trichloroethane	10 U	10 U	10 U		
Benzene	10 U	10 U	10 U		
trans-1,3-Dichloropropene	10 U	10 U	10 U		
Bromoform	10 U	10 U	10 U		
4-Methyl-2-Pentanone	10 U	10 U	10 U		
2-Hexanone	10 U	10 U	10 U		
Tetrachloroethene	10 U	10 U	10 U		
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U		
Toluene	10 U	10 U	10 U		
Chlorobenzene	10 U	10 U	10 U		
Ethylbenzene	10 U	10 U	10 U		
Styrene	10 U	10 U	10 U		
Xylene (total)	10 U	10 U	10 U		

FILENAME: AHY37.SDG DATE: 11/16/94 TIME: 16:23 CADRE 2.01

Water units are reported in ug/L.
Soil units are reported in ug/Kg.

CASE NO: 22742
SDG NO: AHY37

SEMIVOLATILE ANALYSIS

TABLE 1A PAGE 2 OF [illegible]
SITE: RATHE BROS. LANDFILL COLCHESTER, VT
LABORATORY: RECRA ENVIRONMENTAL

EPA SAMPLE NUMBER:	AHY49	AHY50
SAMPLE LOCATION:	EB-SS	EB-SD
LABORATORY SAMPLE NUMBER:	A4540312	A4540313
SAMPLE TYPE:	Equipment Blank	Equipment Blank
MATRIX/ANALYSIS:	WATER/LOW	WATER/LOW
DILUTION FACTOR:	1.0/	1.0/
DATE SAMPLED:	10/05/94	10/05/94
DATE EXTRACTED:	10/10/94	10/10/94
DATE ANALYZED:	10/18/94	10/18/94
PERCENT SOLID:	0	0
BNA		
Phenol	10 U	10 U
bis(2-Chloroethyl) ether	10 U	10 U
2-Chlorophenol	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U
2-Methylphenol	10 U	10 U
2,2'-oxybis(1-Chloropropane	10 U	10 U
4-Methylphenol	10 U	10 U
N-Nitroso-di-n-propylamine	10 U	10 U
Hexachloroethane	10 U	10 U
Nitrobenzene	10 U	10 U
Isophorone	10 U	10 U
2-Nitrophenol	10 U	10 U
2,4-Dimethylphenol	10 U	10 U
bis(2-Chloroethoxy) methane	10 U	10 U
2,4-Dichlorophenol	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U
Naphthalene	10 U	10 U
4-Chloroaniline	10 U	10 U
Hexachlorobutadiene	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U
2-Methylnaphthalene	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U
2,4,5-Trichlorophenol	25 U	25 U
2-Chloronaphthalene	10 U	10 U
2-Nitroaniline	25 U	25 U
Dimethylphthalate	10 U	10 U
Acenaphthylene	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U
3-Nitroaniline	25 U	25 U
Acenaphthene	10 U	10 U
2,4-Dinitrophenol	25 U	25 U
4-Nitrophenol	25 U	25 U
Dibenzofuran	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U
Diethylphthalate	10 U	0.3 J
4-Chlorophenyl-phenyl ether	10 U	10 U
Fluorene	10 U	10 U
4-Nitroaniline	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U
N-nitrosodiphenylamine	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U
Hexachlorobenzene	10 U	10 U
Pentachlorophenol	25 U	25 U
Phenanthrene	10 U	10 U
Anthracene	10 U	10 U
Carbazole	10 U	10 U
Di-n-butylphthalate	10 U	10 U
Fluoranthene	10 U	10 U
Pyrene	10 U	10 U
Butylbenzylphthalate	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U
Benzo(a)anthracene	10 U	10 U
Chrysene	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U
Di-n-octylphthalate	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U
Benzo(a)pyrene	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U
Dibenz(a,h)anthracene	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U

Water units are reported in ug/L.
Soil units are reported in ug/Kg.

CLP PESTICIDE/PCB ORGANIC ANALYSIS
CASE 22742, SDG AHY37
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		EB-SS	EB-SD
Traffic Report Number		AHY49	AHY50
Remarks		Equip. Blank	Equip. Blank
Sampling Date		05-Oct-94	05-Oct-94
Extraction Date		10-Oct-94	10-Oct-94
Analysis Date		25-Oct-94	25-Oct-94
Dilution Factor		1.0	1.0
PESTICIDE/PCB COMPOUND	CRQL		
alpha-BHC	0.05	0.050 U	0.050 U
beta-BHC	0.05	0.050 U	0.050 U
delta-BHC	0.05	0.050 U	0.050 U
gamma-BHC (Lindane)	0.05	0.050 U	0.050 U
Heptachlor	0.05	0.050 U	0.050 U
Aldrin	0.05	0.050 U	0.050 U
Heptachlor epoxide	0.05	0.050 U	0.050 U
Endosulfan I	0.05	0.050 U	0.050 U
Dieldrin	0.10	0.10 U	0.10 U
4,4'-DDE	0.10	0.10 U	0.10 U
Endrin	0.10	0.10 U	0.10 U
Endosulfan II	0.10	0.10 U	0.10 U
4,4'-DDD	0.10	0.10 U	0.10 U
Endosulfan sulfate	0.10	0.10 U	0.10 U
4,4'-DDT	0.10	0.10 U	0.10 U
Methoxychlor	0.50	0.50 U	0.50 U
Endrin ketone	0.10	0.10 U	0.10 U
Endrin aldehyde	0.10	0.10 U	0.10 U
alpha-Chlordane	0.05	0.050 U	0.050 U
gamma-Chlordane	0.05	0.050 U	0.050 U
Toxaphene	5.0	5.0 U	5.0 U
Aroclor-1016	1.0	1.0 U	1.0 U
Aroclor-1221	2.0	2.0 U	2.0 U
Aroclor-1232	1.0	1.0 U	1.0 U
Aroclor-1242	1.0	1.0 U	1.0 U
Aroclor-1248	1.0	1.0 U	1.0 U
Aroclor-1254	1.0	1.0 U	1.0 U
Aroclor-1260	1.0	1.0 U	1.0 U

J - The associated numerical value is an estimated quantity.
U - The compound was not detected. The associated numerical value is the compound quantitation limit.
UJ - The compound was not detected. The compound quantitation limit is an estimated value.
CRQL - Contract Required Detection Limit

CASE NO: 22742
SDG NO: AHY37

VOLATILE SOIL ANALYSIS

SITE: RATHE BROS. LANDFILL COLCHESTER, VT
LABORATORY: RECRA ENVIRONMENTAL

EPA SAMPLE NUMBER:	AHY37	AHY38	AHY39	AHY40	AHY41
SAMPLE LOCATION:	SD-01	SD-02	SD-03	SS-06	SD-05
LABORATORY SAMPLE NUMBER:	A4540301	A4540302	A4540303	A4540319	A4540305
SAMPLE TYPE:	Routine Sample	Routine Sample	Routine Sample	Routine Sample	Routine Sample
MATRIX/ANALYSIS:	SOIL/LOW	SOIL/LOW	SOIL/LOW	SOIL/LOW	SOIL/LOW
DILUTION FACTOR:	1.0/	1.0/	1.0/	1.0/	1.0/
DATE SAMPLED:	10/05/94	10/05/94	10/05/94	10/05/94	10/05/94
DATE ANALYZED:	10/07/94	10/07/94	10/07/94	10/07/94	10/07/94
PERCENT SOLID:	81	76	76	59	81
VOA					
Chloromethane	12 U	13 U	13 U	17 U	12 U
Bromomethane	12 U	13 U	13 U	17 U	12 U
Vinyl Chloride	12 U	13 U	13 U	17 U	12 U
Chloroethane	12 U	13 U	13 U	17 U	12 U
Methylene Chloride	12 U	0.9 J	0.9 J	17 U	12 U
Acetone	11 U	13 U	13 U	17 U	1 J
Carbon Disulfide	12 U	13 U	13 U	17 U	12 U
1,1-Dichloroethene	12 U	13 U	13 U	17 U	12 U
1,1-Dichloroethane	12 U	13 U	13 U	17 U	12 U
1,2-Dichloroethene (total)	12 U	13 U	13 U	17 U	12 U
Chloroform	12 U	13 U	13 U	17 U	12 U
1,2-Dichloroethane	12 U	13 U	13 U	17 U	12 U
2-Butanone	12 U	13 U	13 U	17 U	12 U
1,1,1-Trichloroethane	12 U	13 U	13 U	17 U	12 U
Carbon Tetrachloride	12 U	13 U	13 U	17 U	12 U
Bromodichloromethane	12 U	13 U	13 U	17 U	12 U
1,2-Dichloropropane	12 U	13 U	13 U	17 U	12 U
cis-1,3-Dichloropropene	12 U	13 U	13 U	17 U	12 U
Trichloroethene	12 U	13 U	13 U	17 U	12 U
Dibromochloromethane	12 U	13 U	13 U	17 U	12 U
1,1,2-Trichloroethane	12 U	13 U	13 U	17 U	12 U
Benzene	12 U	13 U	13 U	17 U	12 U
trans-1,3-Dichloropropene	12 U	13 U	13 U	17 U	12 U
Bromoform	12 U	13 U	13 U	17 U	12 U
4-Methyl-2-Pentanone	12 U	13 U	13 U	17 U	12 U
2-Hexanone	12 U	13 U	13 U	17 U	12 U
Tetrachloroethene	12 U	13 U	13 U	17 U	12 U
1,1,2,2-Tetrachloroethane	12 U	13 U	13 U	17 U	12 U
Toluene	12 U	13 U	13 U	17 U	12 U
Chlorobenzene	12 U	13 U	13 U	17 U	12 U
Ethylbenzene	12 U	13 U	13 U	17 U	12 U
Styrene	12 U	13 U	13 U	17 U	12 U
Xylene (total)	12 U	13 U	13 U	17 U	12 U

FILENAME: AHY37.SDG DATE: 11/16/94 TIME: 16:22 CADRE 2.01

Water units are reported in ug/L.
Soil units are reported in ug/Kg.

CASE NO: 22742
SDG NO: AHY37

VOLATILE SOIL ANALYSIS

TABLE III PAGE 5 OF 11
SITE: RATHE BROS. LANDFILL COLCHESTER, VT
LABORATORY: RECRA ENVIRONMENTAL

EPA SAMPLE NUMBER:	AHY42	AHY43	AHY44	AHY45	AHY47
SAMPLE LOCATION:	SD-06	SD-07	SD-08	SD-04	SS-02
LABORATORY SAMPLE NUMBER:	A4540306	A4540307	A4540308	A4540304	A4540310
SAMPLE TYPE:	Duplicate AHY41	Routine Sample	Routine Sample	Routine Sample	Routine Sample
MATRIX/ANALYSIS:	SOIL/LOW	SOIL/LOW	SOIL/LOW	SOIL/LOW	SOIL/LOW
DILUTION FACTOR:	1.0/	1.0/	1.0/	1.0/	1.0/
DATE SAMPLED:	10/05/94	10/05/94	10/05/94	10/05/94	10/05/94
DATE ANALYZED:	10/07/94	10/07/94	10/07/94	10/07/94	10/07/94
PERCENT SOILD:	83	75	83	71	67
VOA					
Chloromethane	12 U	13 U	12 U	14 U	15 U
Bromomethane	12 U	13 U	12 U	14 U	15 U
Vinyl Chloride	12 U	13 U	12 U	14 U	15 U
Chloroethane	12 U	13 U	12 U	14 U	15 U
Methylene Chloride	0.8 J	1 J	1 J	0.9 J	1 J
Acetone	12 U	22	12 U	32	15 U
Carbon Disulfide	12 U	13 U	12 U	14 U	15 U
1,1-Dichloroethene	12 U	13 U	12 U	14 U	15 U
1,1-Dichloroethane	12 U	13 U	12 U	14 U	15 U
1,2-Dichloroethene (total)	12 U	13 U	12 U	14 U	15 U
Chloroform	12 U	13 U	12 U	14 U	15 U
1,2-Dichloroethane	12 U	13 U	12 U	14 U	15 U
2-Butanone	12 U	13 U	12 U	14 U	15 U
1,1,1-Trichloroethane	12 U	13 U	12 U	14 U	15 U
Carbon Tetrachloride	12 U	13 U	12 U	14 U	15 U
Bromodichloromethane	12 U	13 U	12 U	14 U	15 U
1,2-Dichloropropane	12 U	13 U	12 U	14 U	15 U
cis-1,3-Dichloropropene	12 U	13 U	12 U	14 U	15 U
Trichloroethene	12 U	13 U	12 U	14 U	15 U
Dibromochloromethane	12 U	13 U	12 U	14 U	15 U
1,1,2-Trichloroethane	12 U	13 U	12 U	14 U	15 U
Benzene	12 U	13 U	12 U	14 U	15 U
trans-1,3-Dichloropropene	12 U	13 U	12 U	14 U	15 U
Bromoform	12 U	13 U	12 U	14 U	15 U
4-Methyl-2-Pentanone	12 U	13 U	12 U	14 U	15 U
2-Hexanone	12 U	13 U	12 U	14 U	15 U
Tetrachloroethene	12 U	13 U	12 U	14 U	15 U
1,1,2,2-Tetrachloroethane	12 U	13 U	12 U	14 U	15 U
Toluene	12 U	13 U	12 U	14 U	15 U
Chlorobenzene	12 U	13 U	12 U	14 U	15 U
Ethylbenzene	12 U	13 U	12 U	14 U	15 U
Styrene	12 U	13 U	12 U	14 U	15 U
Xylene (total)	12 U	13 U	12 U	14 U	15 U

FILENAME: AHY37.SDG DATE: 11/16/94 TIME: 16:22 CADRE 2.01

Water units are reported in ug/L.
Soil units are reported in ug/Kg.

CASE NO: 22742
SDG NO: AHY37

SITE: RATHE BROS. LANDFILL COLCHESTER, VT
LABORATORY: RECRA ENVIRONMENTAL

EPA SAMPLE NUMBER:	AHY48	AHY55	AHY56		
SAMPLE LOCATION:	SS-03	SS-04	SS-05		
LABORATORY SAMPLE NUMBER:	A4540311	A4540318	A4540309		
SAMPLE TYPE:	Duplicate AHY47	Routine Sample	Routine Sample		
MATRIX/ANALYSIS:	SOIL/LOW	SOIL/LOW	SOIL/LOW		
DILUTION FACTOR:	1.0/	1.0/	1.0/		
DATE SAMPLED:	10/05/94	10/05/94	10/05/94		
DATE ANALYZED:	10/07/94	10/07/94	10/07/94		
PERCENT SOLID:	59	81	94		
VOA					
Chloromethane	17 U	12 U	10 U		
Bromomethane	17 U	12 U	10 U		
Vinyl Chloride	17 U	12 U	10 U		
Chloroethane	17 U	12 U	10 U		
Methylene Chloride	17 U	12 U	10 U		
Acetone	18	1 J	10 U		
Carbon Disulfide	17 U	14	10 U		
1,1-Dichloroethene	17 U	12 U	10 U		
1,1-Dichloroethane	17 U	12 U	10 U		
1,2-Dichloroethene (total)	17 U	12 U	10 U		
Chloroform	17 U	12 U	10 U		
1,2-Dichloroethane	17 U	12 U	10 U		
2-Butanone	17 U	12 U	10 U		
1,1,1-Trichloroethane	17 U	12 U	10 U		
Carbon Tetrachloride	17 U	12 U	10 U		
Bromodichloromethane	17 U	12 U	10 U		
1,2-Dichloropropane	17 U	12 U	10 U		
cis-1,3-Dichloropropene	17 U	12 U	10 U		
Trichloroethene	17 U	12 U	10 U		
Dibromochloromethane	17 U	12 U	10 U		
1,1,2-Trichloroethane	17 U	12 U	10 U		
Benzene	17 U	12 U	10 U		
trans-1,3-Dichloropropene	17 U	12 U	10 U		
Bromoform	17 U	12 U	10 U		
4-Methyl-2-Pentanone	17 U	12 U	10 U		
2-Hexanone	17 U	12 U	10 U		
Tetrachloroethene	17 U	12 U	10 U		
1,1,2,2-Tetrachloroethane	17 U	12 U	10 U		
Toluene	17 U	12 U	10 U		
Chlorobenzene	17 U	12 U	10 U		
Ethylbenzene	17 U	12 U	10 U		
Styrene	17 U	12 U	10 U		
Xylene (total)	17 U	12 U	10 U		

Water units are reported in ug/L.
Soil units are reported in ug/Kg.

CASE NO: 22742
SDG NO: AHY37

SEMIVOLATILE SOIL ANALYSIS

SITE: RATHE BROS. LANDFILL COLCHESTER, VT
LABORATORY: RECRA ENVIRONMENTAL

EPA SAMPLE NUMBER:	AHY37	AHY38	AHY39	AHY40	AHY41
SAMPLE LOCATION:	SD-01	SD-02	SD-03	SS-06	SD-05
LABORATORY SAMPLE NUMBER:	A4540301	A4540302	A4540303	A4540319	A4540305
SAMPLE TYPE:	Routine Sample	Routine Sample	Routine Sample	Routine Sample	Routine Sample
MATRIX/ANALYSIS:	SOIL/LOW	SOIL/LOW	SOIL/LOW	SOIL/LOW	SOIL/LOW
DILUTION FACTOR:	1.0/	1.0/	1.0/	1.0/	1.0/
DATE SAMPLED:	10/05/94	10/05/94	10/05/94	10/05/94	10/05/94
DATE EXTRACTED:	10/08/94	10/08/94	10/27/94	10/08/94	10/08/94
DATE ANALYZED:	10/24/94	10/24/94	11/04/94	10/26/94	10/24/94
PERCENT SOLID:	78	78	83	72	83
BNA					
Phenol	420 U	410 U	R	460 U	400 U
bis(2-Chloroethyl) ether	420 U	410 U	R	460 U	400 U
2-Chlorophenol	420 U	410 U	R	460 U	400 U
1,3-Dichlorobenzene	420 U	410 U	R	460 U	400 U
1,4-Dichlorobenzene	420 U	410 U	R	460 U	400 U
1,2-Dichlorobenzene	420 U	410 U	R	460 U	400 U
2-Methylphenol	420 U	410 U	R	460 U	400 U
2,2'-oxybis(1-Chloropropane	420 U	410 U	R	460 U	400 U
4-Methylphenol	420 U	410 U	R	460 U	400 U
N-Nitroso-di-n-propylamine	420 U	410 U	R	460 U	400 U
Hexachloroethane	420 U	410 U	R	460 U	400 U
Nitrobenzene	420 U	410 U	R	460 U	400 U
Isophorone	420 U	410 U	R	460 U	400 U
2-Nitrophenol	420 U	410 U	R	460 U	400 U
2,4-Dimethylphenol	420 U	410 U	R	460 U	400 U
bis(2-Chloroethoxy) methane	420 U	410 U	R	460 U	400 U
2,4-Dichlorophenol	420 U	410 U	R	460 U	400 U
1,2,4-Trichlorobenzene	420 U	410 U	R	460 U	400 U
Naphthalene	420 U	410 U	R	460 U	400 U
4-Chloroaniline	420 U	410 U	R	460 U	400 U
Hexachlorobutadiene	420 U	410 U	R	460 U	400 U
4-Chloro-3-methylphenol	420 U	410 U	R	460 U	400 U
2-Methylnaphthalene	420 U	410 U	R	460 U	400 U
Hexachlorocyclopentadiene	420 U	410 U	R	460 U	400 U
2,4,6-Trichlorophenol	420 U	410 U	R	460 U	400 U
2,4,5-Trichlorophenol	420 U	410 U	R	460 U	400 U
2-Chloronaphthalene	1000 U	1000 U	R	460 U	400 U
2-Nitroaniline	420 U	410 U	R	1100 U	960 U
Dimethylphthalate	1000 U	1000 U	R	460 U	400 U
Acenaphthylene	420 U	410 U	R	1100 U	960 U
2,6-Dinitrotoluene	420 U	410 U	R	460 U	400 U
3-Nitroaniline	420 U	410 U	R	460 U	400 U
Acenaphthene	1000 U	1000 U	R	460 U	400 U
2,4-Dinitrophenol	420 U	410 U	R	1100 U	960 U
4-Nitrophenol	1000 U	1000 U	R	460 U	400 U
Dibenzofuran	1000 U	1000 U	R	1100 U	960 U
2,4-Dinitrotoluene	420 U	410 U	R	1100 U	960 U
Diethylphthalate	420 U	410 U	R	460 U	400 U
4-Chlorophenyl-phenyl ether	420 U	410 U	R	460 U	400 U
Fluorene	420 U	410 U	R	460 U	400 U
4-Nitroaniline	420 U	410 U	R	460 U	400 U
4,6-Dinitro-2-methylphenol	1000 U	1000 U	R	460 U	400 U
N-nitrosodiphenylamine	1000 U	1000 U	R	1100 U	960 U
4-Bromophenyl-phenylether	420 U	410 U	R	1100 U	960 U
Hexachlorobenzene	420 U	410 U	R	460 U	400 U
Pentachlorophenol	420 U	410 U	R	460 U	400 U
Phenanthrene	1000 U	1000 U	R	460 U	400 U
Anthracene	160 J	410 U	R	1100 U	960 U
Carbazole	420 U	410 U	38 J	21 J	400 U
Di-n-butylphthalate	27 J	410 U	R	460 U	400 U
Fluoranthene	420 U	15 J	R	460 U	400 U
Pyrene	290 J	410 U	21 J	460 U	400 U
Butylbenzylphthalate	270 J	410 U	78 J	22 J	16 J
3,3'-Dichlorobenzidine	420 U	410 U	60 J	22 J	400 U
Benzo(a)anthracene	420 U	410 U	R	460 U	400 U
Chrysene	120 J	410 U	R	460 U	400 U
bis(2-Ethylhexyl)phthalate	130 J	410 U	26 J	460 U	400 U
Di-n-octylphthalate	420 U	410 U	40 J	14 J	400 U
Benzo(b)fluoranthene	420 U	410 U	R	460 U	400 U
Benzo(k)fluoranthene	190 J	410 U	R	460 U	400 U
Benzo(a)pyrene	96 J	410 U	31 J	22 J	400 U
Indeno(1,2,3-cd)pyrene	100 J	410 U	12 J	460 U	400 U
Dibenz(a,h)anthracene	80 J	410 U	17 J	460 U	400 U
Benzo(g,h,i)perylene	93 J	410 U	R	460 U	400 U

FILENAME: AHY37.SDG DATE: 11/16/94 TIME: 16:24 CADRE 2.01

Water units are reported in ug/L.
Soil units are reported in ug/Kg.

CASE NO: 22742
SDG NO: AHY37

SITE: RATHE BROS. LANDFILL COLCHESTER, VT
LABORATORY: RECRA ENVIRONMENTAL

EPA SAMPLE NUMBER:	AHY42	AHY43	AHY44	AHY45	AHY47
SAMPLE LOCATION:	SD-06	SD-07	SD-08	SD-04	SS-02
LABORATORY SAMPLE NUMBER:	A4540306	A4540307	A4540308	A4540304	A4540310
SAMPLE TYPE:	Routine Sample	Routine Sample	Routine Sample	Routine Sample	Routine Sample
MATRIX/ANALYSIS:	SOIL/LOW	SOIL/LOW	SOIL/LOW	SOIL/LOW	SOIL/LOW
DILUTION FACTOR:	1.0/	1.0/	1.0/	1.0/	1.0/
DATE SAMPLED:	10/05/94	10/05/94	10/05/94	10/05/94	10/05/94
DATE EXTRACTED:	10/08/94	10/08/94	10/08/94	10/08/94	10/08/94
DATE ANALYZED:	10/24/94	10/26/94	10/26/94	10/24/94	10/26/94
PERCENT SOLID:	83	76	79	65	44

BNA					
Phenol	390 U	430 U	410 U	490 U	730 U
bis(2-Chloroethyl) ether	390 U	430 U	410 U	490 U	730 U
2-Chlorophenol	390 U	430 U	410 U	490 U	730 U
1,3-Dichlorobenzene	390 U	430 U	410 U	490 U	730 U
1,4-Dichlorobenzene	390 U	430 U	410 U	490 U	730 U
1,2-Dichlorobenzene	390 U	430 U	410 U	490 U	730 U
2-Methylphenol	390 U	430 U	410 U	490 U	730 U
2,2'-oxybis(1-Chloropropane	390 U	430 U	410 U	490 U	730 U
4-Methylphenol	390 U	430 U	410 U	490 U	730 U
N-Nitroso-di-n-propylamine	390 U	430 U	410 U	490 U	730 U
Hexachloroethane	390 U	430 U	410 U	490 U	730 U
Nitrobenzene	390 U	430 U	410 U	490 U	730 U
Isophorone	390 U	430 U	410 U	490 U	730 U
2-Nitrophenol	390 U	430 U	410 U	490 U	730 U
2,4-Dimethylphenol	390 U	430 U	410 U	490 U	730 U
bis(2-Chloroethoxy) methane	390 U	430 U	410 U	490 U	730 U
2,4-Dichlorophenol	390 U	430 U	410 U	490 U	730 U
1,2,4-Trichlorobenzene	390 U	430 U	410 U	490 U	730 U
Naphthalene	390 U	430 U	410 U	490 U	730 U
4-Chloroaniline	390 U	430 U	410 U	490 U	730 U
Hexachlorobutadiene	390 U	430 U	410 U	490 U	730 U
4-Chloro-3-methylphenol	390 U	430 U	410 U	490 U	730 U
2-Methylnaphthalene	390 U	430 U	410 U	490 U	730 U
Hexachlorocyclopentadiene	390 U	430 U	410 U	490 U	730 U
2,4,6-Trichlorophenol	390 U	430 U	410 U	490 U	730 U
2,4,5-Trichlorophenol	950 U	1000 U	990 U	1200 U	1800 U
2-Chloronaphthalene	390 U	430 U	410 U	490 U	730 U
2-Nitroaniline	950 U	1000 U	990 U	1200 U	1800 U
Dimethylphthalate	390 U	430 U	410 U	490 U	730 U
Acenaphthylene	390 U	430 U	410 U	490 U	730 U
2,6-Dinitrotoluene	950 U	1000 U	990 U	1200 U	1800 U
3-Nitroaniline	390 U	430 U	410 U	490 U	730 U
Acenaphthene	950 U	1000 U	990 U	1200 U	1800 U
2,4-Dinitrophenol	950 U	1000 U	990 U	1200 U	1800 U
4-Nitrophenol	390 U	430 U	410 U	490 U	730 U
Dibenzofuran	390 U	430 U	410 U	490 U	730 U
2,4-Dinitrotoluene	390 U	430 U	410 U	490 U	730 U
Diethylphthalate	390 U	430 U	410 U	490 U	730 U
4-Chlorophenyl-phenyl ether	390 U	430 U	410 U	490 U	730 U
Fluorene	390 U	430 U	410 U	490 U	730 U
4-Nitroaniline	950 U	1000 U	990 U	1200 U	1800 U
4,6-Dinitro-2-methylphenol	950 U	1000 U	990 U	1200 U	1800 U
N-nitrosodiphenylamine	390 U	430 U	410 U	490 U	730 U
4-Bromophenyl-phenylether	390 U	430 U	410 U	490 U	730 U
Hexachlorobenzene	390 U	430 U	410 U	490 U	730 U
Pentachlorophenol	950 U	1000 U	990 U	1200 U	1800 U
Phenanthrene	27	9	11	490 U	38
Anthracene	390 U	430 U	410 U	490 U	730 U
Carbazole	390 U	430 U	410 U	490 U	730 U
Di-n-butylphthalate	50	18	17	490 U	730 U
Fluoranthene	42	5	14	490 U	40
Pyrene	390 U	430 U	12	490 U	34
Butylbenzylphthalate	390 U	430 U	410 U	490 U	14
3,3'-Dichlorobenzidine	390 U	430 U	410 U	490 U	730 U
Benzo(a)anthracene	390 U	430 U	410 U	490 U	730 U
Chrysene	19	430 U	10	490 U	20
bis(2-Ethylhexyl)phthalate	390 U	430 U	410 U	490 U	730 U
Di-n-octylphthalate	390 U	430 U	410 U	490 U	730 U
Benzo(b)fluoranthene	33	430 U	11	490 U	30
Benzo(k)fluoranthene	390 U	430 U	410 U	490 U	13
Benzo(a)pyrene	390 U	430 U	410 U	80	16
Indeno(1,2,3-cd)pyrene	390 U	430 U	410 U	490 U	730 U
Dibenz(a,h)anthracene	390 U	430 U	410 U	490 U	730 U
Benzo(g,h,i)perylene	390 U	430 U	410 U	490 U	730 U

Water units are reported in ug/L.
Soil units are reported in ug/Kg.

EPA SAMPLE NUMBER:	AHY48	AHY55	AHY56
SAMPLE LOCATION:	SS-03	SS-04	SS-05
LABORATORY SAMPLE NUMBER:	A4540311	A4540318	A4540309
SAMPLE TYPE:	Routine Sample	Routine Sample	Routine Sample
MATRIX/ANALYSIS:	SOIL/LOW	SOIL/LOW	SOIL/LOW
DILUTION FACTOR:	1.0/	1.0/	1.0/
DATE SAMPLED:	10/05/94	10/05/94	10/05/94
DATE EXTRACTED:	10/08/94	10/08/94	10/08/94
DATE ANALYZED:	10/26/94	10/26/94	10/26/94
PERCENT SOLID:	55	70	94
BNA			
Phenol	600 U	460 U	340 U
bis(2-Chloroethyl) ether	600 U	460 U	340 U
2-Chlorophenol	600 U	460 U	340 U
1,3-Dichlorobenzene	600 U	460 U	340 U
1,4-Dichlorobenzene	600 U	460 U	340 U
1,2-Dichlorobenzene	600 U	460 U	340 U
2-Methylphenol	600 U	460 U	340 U
2,2'-oxybis(1-Chloropropane	600 U	460 U	340 U
4-Methylphenol	600 U	460 U	340 U
N-Nitroso-di-n-propylamine	600 U	460 U	340 U
Hexachloroethane	600 U	460 U	340 U
Nitrobenzene	600 U	460 U	340 U
Isophorone	600 U	460 U	340 U
2-Nitrophenol	600 U	460 U	340 U
2,4-Dimethylphenol	600 U	460 U	340 U
bis(2-Chloroethoxy) methane	600 U	460 U	340 U
2,4-Dichlorophenol	600 U	460 U	340 U
1,2,4-Trichlorobenzene	600 U	460 U	340 U
Naphthalene	600 U	460 U	340 U
4-Chloroaniline	600 U	460 U	340 U
Hexachlorobutadiene	600 U	460 U	340 U
4-Chloro-3-methylphenol	600 U	460 U	340 U
2-Methylnaphthalene	600 U	460 U	340 U
Hexachlorocyclopentadiene	600 U	7 J	340 U
2,4,6-Trichlorophenol	600 U	460 U	340 U
2,4,5-Trichlorophenol	600 U	460 U	340 U
2-Chloronaphthalene	1400 U	1100 U	830 U
2-Nitroaniline	600 U	460 U	340 U
Dimethylphthalate	1400 U	1100 U	830 U
Acenaphthylene	600 U	460 U	340 U
2,6-Dinitrotoluene	600 U	460 U	340 U
3-Nitroaniline	600 U	460 U	340 U
Acenaphthene	1400 U	1100 U	830 U
2,4-Dinitrophenol	600 U	460 U	340 U
4-Nitrophenol	1400 U	1100 U	830 U
Dibenzofuran	1400 U	1100 U	830 U
2,4-Dinitrotoluene	600 U	2 J	340 U
Diethylphthalate	600 U	460 U	340 U
4-Chlorophenyl-phenyl ether	600 U	460 U	340 U
Fluorene	600 U	460 U	340 U
4-Nitroaniline	600 U	460 U	340 U
4,6-Dinitro-2-methylphenol	1400 U	1100 U	830 U
N-nitrosodiphenylamine	1400 U	1100 U	830 U
4-Bromophenyl-phenylether	600 U	460 U	340 U
Hexachlorobenzene	600 U	460 U	340 U
Pentachlorophenol	600 U	460 U	340 U
Phenanthrene	1400 U	1100 U	830 U
Anthracene	23 J	43 J	27 J
Carbazole	600 U	460 U	340 U
Di-n-butylphthalate	600 U	460 U	340 U
Fluoranthene	15 J	33 J	41 J
Pyrene	14 J	21 J	20 J
Butylbenzylphthalate	600 U	19 J	15 J
3,3'-Dichlorobenzidine	600 U	460 U	340 U
Benzo(a)anthracene	600 U	460 U	340 U
Chrysene	12 J	10 J	11 J
bis(2-Ethylhexyl)phthalate	980	460 U	970
Di-n-octylphthalate	600 U	460 U	340 U
Benzo(b)fluoranthene	19 J	11 J	15 J
Benzo(k)fluoranthene	600 U	460 U	340 U
Benzo(a)pyrene	7 J	460 U	7 J
Indeno(1,2,3-cd)pyrene	600 U	460 U	340 U
Dibenz(a,h)anthracene	600 U	460 U	340 U
Benzo(g,h,i)perylene	600 U	18 J	340 U

Water units are reported in ug/L.
Soil units are reported in ug/Kg.

Site: Rathe Brothers Landfill
Laboratory: RECRA Environmental Inc
Disk: 7710023-DV05
File: 22742PSR.WK4

CLP PESTICIDE/PCB ORGANIC ANALYSIS
CASE 22742, SDG AHY37
SOIL ANALYTICAL RESULTS (ug/kg)

Sample Location	SD-01	SD-02	SD-03	SS-06	SD-05	SD-06	SD-07	SD-08	SD-04	SS-02
Traffic Report Number	AHY37	AHY38	AHY39	AHY40	AHY41	AHY42	AHY43	AHY44	AHY45	AHY47
Remarks						Dup.AHY41				
Sampling Date	05-Oct-94	05-Oct-94	05-Oct-94	05-Oct-94	05-Oct-94	05-Oct-94	05-Oct-94	05-Oct-94	05-Oct-94	05-Oct-94
Extraction Date	11-Oct-94	11-Oct-94	11-Oct-94	11-Oct-94	11-Oct-94	11-Oct-94	11-Oct-94	11-Oct-94	11-Oct-94	11-Oct-94
Analysis Date	25-Oct-94	25-Oct-94	25-Oct-94	26-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94	26-Oct-94
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Percent Solid	78.0%	78.0%	83.0%	72.0%	83.0%	83.0%	76.0%	79.0%	65.0%	44.0%
PESTICIDE/PCB COMPOUND										
alpha-BHC	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
beta-BHC	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
delta-BHC	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
gamma-BHC (Lindane)	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
Heptachlor	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
Aldrin	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
Heptachlor epoxide	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
Endosulfan I	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
Dieldrin	4.2 U	4.2 U	3.9 U	4.5 U	3.9 U	3.8 U	4.3 U	4.1 U	5.1 U	7.3 U
4,4'-DDE	4.2 U	4.2 U	3.9 U	4.5 U	3.9 U	3.8 U	4.3 U	4.1 U	5.1 U	7.3 U
Endrin	4.2 U	4.2 U	3.9 U	4.5 U	3.9 U	3.8 U	4.3 U	4.1 U	5.1 U	7.3 U
Endosulfan II	4.2 U	4.2 U	3.9 U	4.5 U	3.9 U	3.8 U	4.3 U	4.1 U	5.1 U	7.3 U
4,4'-DDD	4.2 U	4.2 U	0.42 J	4.5 U	3.9 U	3.8 U	4.3 U	4.1 U	5.1 U	7.3 U
Endosulfan sulfate	4.2 U	4.2 U	3.9 U	4.5 U	3.9 U	3.8 U	4.3 U	4.1 U	5.1 U	3.1 J
4,4'-DDT	4.2 U	4.2 U	3.9 U	4.5 U	3.9 U	3.8 U	7.3	4.1 U	5.1 U	7.3 U
Methoxychlor	22 U	22 U	20 U	23 U	20 U	20 U	22 U	21 U	26 U	38 U
Endrin ketone	4.2 U	4.2 U	3.9 U	4.5 U	3.9 U	3.8 U	4.3 U	4.1 U	5.1 U	7.3 U
Endrin aldehyde	4.2 U	4.2 U	3.9 U	4.5 U	3.9 U	3.8 U	4.3 U	4.1 U	5.1 U	7.3 U
alpha-Chlordane	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
gamma-Chlordane	2.2 U	2.2 U	2.0 U	2.3 U	2.0 U	2.0 U	2.2 U	2.1 U	2.6 U	3.8 U
Toxaphene	220 U	220 U	200 U	230 U	200 U	200 U	220 U	210 U	260 U	380 U
Aroclor-1016	42 U	42 U	39 U	45 U	39 U	38 U	43 U	41 U	51 U	73 U
Aroclor-1221	85 U	85 U	80 U	92 U	79 U	78 U	86 U	83 U	100 U	150 U
Aroclor-1232	42 U	42 U	39 U	45 U	39 U	38 U	43 U	41 U	51 U	73 U
Aroclor-1242	42 U	42 U	39 U	45 U	39 U	38 U	43 U	41 U	51 U	73 U
Aroclor-1248	42 U	42 U	39 U	45 U	39 U	38 U	43 U	41 U	51 U	73 U
Aroclor-1254	42 U	42 U	39 U	45 U	39 U	38 U	43 U	41 U	51 U	120 U
Aroclor-1260	42 U	42 U	39 U	45 U	39 U	38 U	43 U	41 U	51 U	73 U

Sample results are reported on dry weight basis
J The associated numerical value is an estimated quantity
U The compound was not detected The associated numerical value is the compound quantitation limit
UJ The compound was not detected The compound quantitation limit is an estimated value.
R The datum was rejected

Site: Rathe Brothers Landfill
Laboratory: RECRA Environmental Inc.
Disk: 7710023-DV05
File: 22742PSR.WK4

CLP PESTICIDE/PCB ORGANIC ANALYSIS
CASE 22742, SDG AHY37
SOIL ANALYTICAL RESULTS (ug/kg)

Sample Location	SS-03	SS-04	SS-05
Traffic Report Number	AHY48	AHY55	AHY56
Remarks	Dup AHY47		
Sampling Date	05-Oct-94	05-Oct-94	05-Oct-94
Extraction Date	11-Oct-94	11-Oct-94	11-Oct-94
Analysis Date	26-Oct-94	26-Oct-94	25-Oct-94
Dilution Factor	1.0	1.0	1.0
Percent Solid	55.0%	70.0%	94.0%
PESTICIDE/PCB COMPOUND			
alpha-BHC	3.1 U	2.4 U	1.8 U
beta-BHC	3.1 U	2.4 U	1.8 U
delta-BHC	1.2 J	2.4 U	1.8 U
gamma-BHC (Lindane)	3.1 U	2.4 U	1.8 U
Heptachlor	3.1 U	2.4 U	1.8 U
Aldrin	3.1 U	2.4 U	1.8 U
Heptachlor epoxide	3.1 U	2.4 U	1.8 U
Endosulfan I	3.1 U	2.4 U	1.8 U
Dieldrin	6.0 U	4.6 U	3.4 U
4,4'-DDE	6.0 U	4.6 U	14
Endrin	6.0 U	4.6 U	3.4 U
Endosulfan II	6.0 U	4.6 U	3.4 U
4,4'-DDD	3.3 J	4.6 U	3.4 U
Endosulfan sulfate	6.0 U	4.6 U	3.4 U
4,4'-DDT	6.0 U	4.6 U	22
Methoxychlor	31 U	24 U	18 U
Endrin ketone	6.0 U	4.6 U	3.4 U
Endrin aldehyde	6.0 U	4.6 U	3.4 U
alpha-Chlordane	3.1 U	2.4 U	1.8 U
gamma-Chlordane	3.1 U	2.4 U	1.8 U
Toxaphene	310 U	240 U	180 U
Aroclor-1016	60 U	46 U	34 U
Aroclor-1221	120 U	94 U	69 U
Aroclor-1232	60 U	46 U	34 U
Aroclor-1242	60 U	46 U	34 U
Aroclor-1248	130 U	46 U	34 U
Aroclor-1254	60 U	46 U	34 U
Aroclor-1260	60 U	46 U	34 U

Sample results are reported on dry weight basis
J The associated numerical value is an estimated quantity
U The compound was not detected The associated numerical value is the compound quantitation limit
UJ The compound was not detected The compound quantitation limit is an estimated value
R The datum was rejected

Data Summary Key

A - Acceptable data.

J - The associated numerical value is an estimated quantity.

U - The compound was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

R - Reject data because quality control criteria were exceeded. The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.

ATTACHMENT B

RATHE BROTHERS' LANDFILL

INORGANIC SOIL AND SEDIMENT SAMPLE ANALYTICAL RESULTS
CDM FEDERAL PROGRAMS CORPORATION

OCTOBER 5, 1994
(sampling date)

Site: Rathe Brothers Landfill
Laboratory: IT Analytical Services-Export, PA
Disk: 7710023-DV06
File: 22742MAR.WK4

CLP INORGANIC ANALYSIS
CASE 22742, SDG MAFJ67
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location				MAFJ67	MAFJ68
Traffic Report Number				EB-SS	EB-SD
Remarks				Equip.blank	Equip.blank
Sampling Date				05-Oct-94	05-Oct-94
Dilution Factor				1.0	1.0
INORGANIC ANALYTES		IDL (ug/L)	CRDL (ug/L)		
Aluminum	P	11.0	200	13.3 J	11 U
Antimony	P	12.2	60	12.2 U	12.2 U
Arsenic	P	2.3	10	2.3 U	2.3 U
Barium	P	0.5	200	0.50 U	0.50 U
Beryllium	P	0.1	5	0.10 U	0.10 U
Cadmium	P	1.5	5	1.5 U	1.6 J
Calcium	P	6.3	5000	19.8	25.1
Chromium	P	1.8	10	1.8 U	1.8 U
Cobalt	P	1.9	50	1.9 U	1.9 U
Copper	P	1.4	25	1.4 U	1.4 U
Iron	P	1.5	100	3.5	6.4
Lead	P	1.4	3	1.4 U	1.4 U
Magnesium	P	11.1	5000	11.2 J	13.0 J
Manganese	P	0.4	15	0.71 J	0.95
Mercury	CV	0.2	0.2	0.20 U	0.20 U
Nickel	P	4.3	40	4.3 U	4.3 U
Potassium	P	381	5000	381 U	381 U
Selenium	P	2.6	5	2.6 UJ	2.6 UJ
Silver	P	2.0	10	2.0 U	2.0 U
Sodium	P	9.2	5000	53.1	47.5
Thallium	P	4.0	10	4.0 UJ	4.0 UJ
Vanadium	P	1.4	50	1.4 U	1.4 U
Zinc	P	1.0	20	3.9	4.3
Cyanide	AS	10.0	10	5.0 U	5.0 U

Analytical Method
P ICP/Flame AA
CV Cold Vapor
AS Semi-Automated Spectrophotometric Analysis

J - The associated numerical value is an estimated quantity.
U - The analyte was not detected. The associated numerical value is the analyte detection limit.
UJ - The analyte was not detected. The analyte detection limit is an estimated value.
IDL Instrument Detection Limit
CRDL Contract Required Detection Limit

Site: Rathe Brothers Landfill
Laboratory: IT Analytical Services-Export, PA
Disk: 7710023-DV06
File: 22742MSR

CLP INORGANIC ANALYSIS
CASE 22742, SDG MAES65
SOIL ANALYTICAL RESULTS (mg/Kg)

Sample Location		MAES65		MAES66		MAFJ55		MAFJ56		MAFJ57		MAFJ58		MAFJ59		MAFJ60		MAFJ61	
Traffic Report Number		SS 04		SS-05		SD-01		SD-02		SD-03		SS-06		SD-05		SD-06		SD-07	
Remarks																Dup.MAFJ59			
Sampling Date		05-Oct-94		05-Oct-94		05-Oct-94		05-Oct-94		05-Oct-94		05-Oct-94		05-Oct-94		05-Oct-94		05-Oct-94	
Percent Solid		75.9%		94.5%		82.7%		79.2%		82.2%		60.3%		79.3%		80.8%		81.4%	
Dilution Factor		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
INORGANIC ANALYTES																			
Aluminum	P	3510		7670		3470		12200		3160		5400		3420		2750		4230	
Antimony	P	3.2	UJ	2.6	UJ	2.8	UJ	3.0	UJ	2.9	UJ	3.9	UJ	2.9	UJ	3.0	UJ	3.0	UJ
Arsenic	P	2.4		3.9		3.9		5.2		3.2		5.8		5.1		2.7		3.4	
Barium	P	29.4		30.4		14.8		46.3		13.6		378		13.8		11.6		16.8	
Beryllium	P	0.19		0.26		0.13		0.33		0.15		0.19		0.14		0.09		0.16	
Cadmium	P	0.40	UJ	0.32	U	0.46	UJ	0.37	U	0.36	U	0.47	U	0.36	U	0.37	U	0.36	U
Calcium	P	11100		274		1660		4790		15000		20400		1540		1550		1940	
Chromium	P	8.6		12.3		7.2		23.4		7.1		10.1		8.1		6.6		8.6	
Cobalt	P	8.6		5.5		5.8		15.5		5.0		12.3		6.3		4.0		5.9	
Copper	P	7.5		6.4		6.1		28.2		5.0		12.9		6.6		4.5		8.2	
Iron	P	14600		14000		9740		29600		10400		49300		11400		8450		10600	
Lead	P	4.1	J	10.2	J	3.5	J	9.4	J	3.3	J	10.9	J	4.7	J	3.1	J	3.9	J
Magnesium	P	6330		1960		1920		8570		9390		3250		1870		1580		2050	
Manganese	P	277	J	150	J	274	J	988	J	305	J	1180	J	236	J	219	J	147	J
Mercury	CV	0.13	U	0.11	U	0.12	U	0.13	U	0.12	U	0.17	U	0.13	U	0.12	U	0.12	U
Nickel	P	19.1		13.5		11.2		39.1		10.2		17.5		12.9		9.1		12.8	
Potassium	P	574		301		316		1660		243		811		246		156	J	289	
Selenium	P	0.69	U	0.55	U	0.60	U	0.64	U	0.63	U	0.82	U	0.62	U	0.64	U	0.63	U
Silver	P	0.53	U	0.42	U	0.46	U	0.49	U	0.48	U	0.63	U	0.48	U	0.50	U	0.49	U
Sodium	P	128	U	73.7	U	94.1	U	108	U	46.9	U	387	U	91.3	U	34.3	U	57.0	U
Thallium	P	1.3	UJ	1.0	UJ	0.92	U	1.3	UJ	0.96	U	1.4	UJ	1.5	UJ	0.99	U	1.3	UJ
Vanadium	P	6.5		13.6		7.7		19.3		7.6		9.4		9.0		6.7		8.5	
Zinc	P	24.2	J	32.6	J	24.9	J	65.5	J	22.9	J	119	J	20.7	J	17.6	J	28.1	J
Cyanide	AS	3.3	U	2.6	U	3.0	U	3.2	U	3.0	U	4.1	U	3.2	U	3.1	U	3.1	U

Analytical Method
P ICP
CV Cold Vapor
AS Semi-Automated Spectrophotometric Analysis

Sample Results are reported on dry weight basis.
J - The associated numerical value is an estimated quantity.
U - The analyte was not detected. The associated numerical value is the analyte detection limit.
UJ - The analyte was not detected. The analyte detection limit is an estimated value.

Site: Rathe Brothers Landfill
Laboratory: IT Analytical Services-Export
Disk: 7710023-OV06
File: 22742MSR

CLP INORGANIC ANALYSIS
CASE 22742 , SDG MAES65
SOIL ANALYTICAL RESULTS (mg/Kg)

Sample Location		MAFJ62		MAFJ63		MAFJ65		MAFJ66	
Traffic Report Number		SD 08		SD-04		SS-02		SS-03	
Remarks								Dup.MAFJ65	
Sampling Date		05-Oct-94		05-Oct-94		05-Oct-94		05-Oct-94	
Percent Solid		78.9%		67.7%		67.7%		59.0%	
Dilution Factor		1.0		1.0		1.0		1.0	
INORGANIC ANALYTES									
Aluminum	P	2670		6050		4300		5530	
Antimony	P	3.0	UJ	3.6	UJ	3.6	UJ	6.8	J
Arsenic	P	3.4		4.2		3.8		3.9	
Barium	P	10.5		23.4		106		115	
Beryllium	P	0.14		0.23		0.20		0.24	
Cadmium	P	0.37	U	0.44	U	0.44	U	0.51	U
Calcium	P	2300		2910		15800		13400	
Chromium	P	7.1		11.5		16.1		16.2	
Cobalt	P	4.4		8.9		27.8		32.3	
Copper	P	5.0		12.8		10.9		14.5	
Iron	P	8630		12500		68800		78000	
Lead	P	3.3	J	5.2	J	8.1	J	9.7	J
Magnesium	P	2000		3470		4660		4840	
Manganese	P	144	J	238	J	546	J	573	J
Mercury	CV	0.13	U	0.15	U	0.15	U	0.17	U
Nickel	P	10.3		18.5		85.4		106	
Potassium	P	211		498		754		1010	
Selenium	P	0.65	U	0.77	U	0.77	U	0.88	U
Silver	P	0.50	U	0.59	U	0.59	U	0.68	U
Sodium	P	89.3	U	135	U	250	U	250	U
Thallium	P	0.99	U	1.2	U	3.9	UJ	3.7	UJ
Vanadium	P	7.4		11.6		7.9		9.4	
Zinc	P	18.9	J	31.1	J	83.3	J	103	J
Cyanide	AS	3.2	U	3.7	U	3.7	U	4.2	U

Analytical Method
P ICP
CV Cold Vapor
AS Semi-Automated Spectrophotometric Analysis

Sample Results are reported on dry weight basis.
J - The associated numerical value is an estimated quantity.
U - The analyte was not detected. The associated numerical value is the analyte detection limit.
UJ - The analyte was not detected. The analyte detection limit is an estimated value.

Data Summary Key

A - Acceptable data.

J - The associated numerical value is an estimated quantity.

U - The compound was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

R - Reject data because quality control criteria were exceeded. The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.

ATTACHMENT C

RATHE BROTHERS' LANDFILL

ORGANIC GROUNDWATER SAMPLE ANALYTICAL RESULTS
CDM FEDERAL PROGRAMS CORPORATION

OCTOBER 5, 1994
(sampling date)

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc.
Disk 7710023-DV04
File 0013CVOA.WK4

CLP VOLATILE ORGANIC ANALYSIS
EPA DRINKING WATER METHOD 524.2 MODIFIED
DAS Case 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09	GW-10
Traffic Report Number		DAC140	DAC141	DAC142	DAC143	DAC144	DAC145	DAC146	DAC147	DAC148	DAC149
Remarks				DUP DAC141							
Sampling Date		05-Oct-94	05-Oct-94	05-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94
Analysis Date		15-Oct-94	15-Oct-94	15-Oct-94	16-Oct-94	16-Oct-94	16-Oct-94	16-Oct-94	17-Oct-94	17-Oct-94	17-Oct-94
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOLATILE ORGANIC COMPOUND	CRQL										
Dichlorodifluoromethane	1	14 J	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Chloromethane	1	1 UJ	0.6 J	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Vinyl Chloride	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Bromomethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Chloroethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Trichlorofluoromethane	5	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,1-Dichloroethene	5	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Acetone	5	5 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U
Carbon Disulfide	5	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Methylene Chloride	1	1.7 UJ	1.7 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,1-Dichloroethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
2,2-Dichloropropane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
2-Butanone	5	R	R	R	R	R	R	R	R	R	R
cis-1,2-Dichloroethene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Bromochloromethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Chloroform	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,1,1-Trichloroethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Carbon tetrachloride	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,1-Dichloropropene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Benzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,2-Dichloroethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Trichloroethene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,2-Dichloropropane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Dibromomethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Bromodichloromethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
cis-1,3-Dichloropropene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
4-Methyl-2-pentanone	5	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U
Toluene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
trans-1,3-Dichloropropene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,1,2-Trichloroethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Tetrachloroethene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,3-Dichloropropane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U

J - The associated numerical value is an estimated quantity
U - The compound was not detected. The associated numerical value is the compound quantitation limit.
UJ - The compound was not detected. The compound quantitation limit is an estimated value
R - The datum was rejected
CRQL - Contract Required Quantitation Limit

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc
Disk: 7710023-DV04
File: 0013CVOA.WK4

CLP VOLATILE ORGANIC ANALYSIS
EPA DRINKING WATER METHOD 524.2 MODIFIED
DAS Case 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09	GW-10
Traffic Report Number		DAC140	DAC141	DAC142	DAC143	DAC144	DAC145	DAC146	DAC147	DAC148	DAC149
Remarks				DUP DAC141							
Sampling Date		05-Oct-94	05-Oct-94	05-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94
Analysis Date		15-Oct-94	15-Oct-94	15-Oct-94	16-Oct-94	16-Oct-94	16-Oct-94	16-Oct-94	17-Oct-94	17-Oct-94	17-Oct-94
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOLATILE ORGANIC COMPOUND	CROL										
2-Hexanone	5	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	R	R	R
Dibromochloromethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,2-Dibromoethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Chlorobenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,1,1,2-Tetrachloroethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Ethylbenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
m&p-Xylene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
o-Xylene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Styrene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Bromoform	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Isopropylbenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Bromobenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,1,2,2-Tetrachloroethane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,2,3-Trichloropropane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
N-Propylbenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
2-Chlorotoluene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
4-Chlorotoluene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,3,5-Trimethylbenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
tert-Butylbenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,2,4-Trimethylbenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Sec-Butylbenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,3-Dichlorobenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
p-Isopropyltoluene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,4-Dichlorobenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,2-Dichlorobenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
N-butylbenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,2-Dibromo-3-Chloropropane	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,2,4-Trichlorobenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Hexachlorobutadiene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
Naphthalene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U
1,2,3-Trichlorobenzene	1	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U

J - The associated numerical value is an estimated quantity
U - The compound was not detected. The associated numerical value is the compound quantitation limit
UJ - The compound was not detected. The compound quantitation limit is an estimated value
R - The datum was rejected
CROL - Contract Required Quantitation Limit

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc.
Disk: 7710023-DV04
File: 0013CVOA.WK4

CLP VOLATILE ORGANIC ANALYSIS
EPA DRINKING WATER METHOD 524.2 MODIFIED
DAS Case 0013C SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		FB-02	EB-GW	GW-11
Traffic Report Number		DAC155	DAC156	DAC157
Remarks		Trip Blank	Equip. Blank	
Sampling Date		05-Oct-94	05-Oct-94	06-Oct-94
Analysis Date		18-Oct-94	18-Oct-94	18-Oct-94
Dilution Factor		1.0	1.0	1.0
VOLATILE ORGANIC COMPOUND	CRQL			
Dichlorodifluoromethane	1	1 UJ	1 UJ	11 J
Chloromethane	1	1 UJ	1 UJ	0.6 J
Vinyl Chloride	1	1 UJ	1 UJ	1 UJ
Bromomethane	1	1 UJ	1 UJ	1 UJ
Chloroethane	1	1 UJ	1 UJ	1 UJ
Trichlorofluoromethane	5	1 UJ	1 UJ	1 UJ
1,1-Dichloroethene	5	1 UJ	1 UJ	1 UJ
Acetone	5	1.6 J	14 J	5 UJ
Carbon Disulfide	5	1 UJ	1 UJ	1 UJ
Methylene Chloride	1	0.7 J	0.8 J	1 UJ
trans-1,2-Dichloroethene	1	1 UJ	1 UJ	1 UJ
1,1-Dichloroethane	1	1 UJ	1 UJ	1 UJ
2,2-Dichloropropane	1	1 UJ	1 UJ	1 UJ
2-Butanone	5	5.2 J	39 J	R
cis-1,2-Dichloroethene	1	1 UJ	1 UJ	1 UJ
Bromochloromethane	1	1 UJ	1 UJ	1 UJ
Chloroform	1	1 UJ	1 UJ	1 UJ
1,1,1-Trichloroethane	1	1 UJ	1 UJ	1 UJ
Carbon tetrachloride	1	1 UJ	1 UJ	1 UJ
1,1-Dichloropropene	1	1 UJ	1 UJ	1 UJ
Benzene	1	1 UJ	1 UJ	1 UJ
1,2-Dichloroethane	1	1 UJ	1 UJ	1 UJ
Trichloroethene	1	1 UJ	1 UJ	1 UJ
1,2-Dichloropropane	1	1 UJ	1 UJ	1 UJ
Dibromomethane	1	1 UJ	1 UJ	1 UJ
Bromodichloromethane	1	1 UJ	1 UJ	1 UJ
cis-1,3-Dichloropropene	1	1 UJ	1 UJ	1 UJ
4-Methyl-2-pentanone	5	5 UJ	5 UJ	5 UJ
Toluene	1	1 UJ	1 UJ	1 UJ
trans-1,3-Dichloropropene	1	1 UJ	1 UJ	1 UJ
1,1,2-Trichloroethane	1	1 UJ	1 UJ	1 UJ
Tetrachloroethene	1	1 UJ	1 UJ	1 UJ
1,3-Dichloropropane	1	1 UJ	1 UJ	1 UJ

J - The associated numerical value is an estimated quantity
U - The compound was not detected. The associated numerical value is the compound quantitation limit
UJ - The compound was not detected. The compound quantitation limit is an estimated value
R - The data was rejected
CRQL - Contract Required Quantitation Limit

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc.
Disk: 7710023-DV04
File: 0013CVOA.WK4

CLP VOLATILE ORGANIC ANALYSIS
EPA DRINKING WATER METHOD 524.2 MODIFIED
DAS Case 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		TB-02	EB-GW	GW-11
Traffic Report Number		DAC155	DAC156	DAC157
Remarks		Trip Blank	Equip. Blank	
Sampling Date		05-Oct-94	05-Oct-94	06-Oct-94
Analysis Date		18-Oct-94	18-Oct-94	18-Oct-94
Dilution Factor		1.0	1.0	1.0
VOLATILE ORGANIC COMPOUND	CRQL			
2-Hexanone	5	R	R	R
Dibromochloromethane	1	1 UJ	1 UJ	1 UJ
1,2-Dibromoethane	1	1 UJ	1 UJ	1 UJ
Chlorobenzene	1	1 UJ	1 UJ	1 UJ
1,1,1,2-Tetrachloroethane	1	1 UJ	1 UJ	1 UJ
Ethylbenzene	1	1 UJ	1 UJ	1 UJ
m&p-Xylene	1	1 UJ	1 UJ	1 UJ
o-Xylene	1	1 UJ	1 UJ	1 UJ
Styrene	1	1 UJ	1 UJ	1 UJ
Bromoform	1	1 UJ	1 UJ	1 UJ
Isopropylbenzene	1	1 UJ	1 UJ	1 UJ
Bromobenzene	1	1 UJ	1 UJ	1 UJ
1,1,2,2-Tetrachloroethane	1	1 UJ	1 UJ	1 UJ
1,2,3-Trichloropropane	1	1 UJ	1 UJ	1 UJ
N-Propylbenzene	1	1 UJ	1 UJ	1 UJ
2-Chlorotoluene	1	1 UJ	1 UJ	1 UJ
4-Chlorotoluene	1	1 UJ	1 UJ	1 UJ
1,3,5-Trimethylbenzene	1	1 UJ	1 UJ	1 UJ
tert-Butylbenzene	1	1 UJ	1 UJ	1 UJ
1,2,4-Trimethylbenzene	1	1 UJ	1 UJ	1 UJ
Sec-Butylbenzene	1	1 UJ	1 UJ	1 UJ
1,3-Dichlorobenzene	1	1 UJ	1 UJ	1 UJ
p-Isopropyltoluene	1	1 UJ	1 UJ	1 UJ
1,4-Dichlorobenzene	1	1 UJ	1 UJ	1 UJ
1,2-Dichlorobenzene	1	1 UJ	1 UJ	1 UJ
N-butylbenzene	1	1 UJ	1 UJ	1 UJ
1,2-Dibromo-3-Chloropropane	1	1 UJ	R	R
1,2,4-Trichlorobenzene	1	1 UJ	1 UJ	1 UJ
Hexachlorobutadiene	1	1 UJ	1 UJ	1 UJ
Naphthalene	1	1 UJ	1 UJ	1 UJ
1,2,3-Trichlorobenzene	1	1 UJ	1 UJ	1 UJ

J - The associated numerical value is an estimated quantity.
U - The compound was not detected. The associated numerical value is the compound quantitation limit
UJ - The compound was not detected. The compound quantitation limit is an estimated value
R - The datum was rejected.
CRQL - Contract Required Quantitation Limit

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc
Disk: 7710023 DV04
File: 0013CBNA.WK4

CLP SEMIVOLATILE ORGANIC ANALYSIS
LOW CONCENTRATION WATER ANALYSIS-MODIFIED
DAS CASE 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09	GW-10
Traffic Report Number		DAC140	DAC141	DAC142	DAC143	DAC144	DAC145	DAC146	DAC147	DAC148	DAC149
Remarks				DUP DAC141							
Sampling Date		05-Oct-94	05-Oct-94	05-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94
Extraction Date		12-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94	13-Oct-94	13-Oct-94	13-Oct-94
Analysis Date		24-Oct-94	24-Oct-94	24-Oct-94	24-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SEMI-VOLATILE COMPOUND	CRQL (ug/L)										
bis (2-Chloroethyl) ether	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Phenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Chlorophenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
bis (2-Chloroisopropyl) ether	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Methylphenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Hexachloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methylphenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Nitrobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Isophorone	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Nitrophenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroethoxy)methane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Naphthalene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chloroaniline	5	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
Hexachlorobutadiene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Methylnaphthalene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Chloronaphthalene	20	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2-Nitroaniline	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acenaphthylene	20	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Dimethylphthalate	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acenaphthene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
3-Nitroaniline	20	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U

J - The associated numerical value is an estimated quantity
U - The compound was not detected. The associated numerical value is the compound quantitation limit
UJ - The compound was not detected. The compound quantitation limit is an estimated value
R - The datum was rejected
CRQL - Contract Required Detection Limit

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc
Disk: 7710023-DV04
File: 0013CBNA.WK4

CLP SEMIVOLATILE ORGANIC ANALYSIS
LOW CONCENTRATION WATER ANALYSIS-MODIFIED
DAS CASE 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09	GW-10
Traffic Report Number		DAC140	DAC141	DAC142	DAC143	DAC144	DAC145	DAC146	DAC147	DAC148	DAC149
Remarks				DUP DAC141							
Sampling Date		05-Oct-94	05-Oct-94	05-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94
Extraction Date		12-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94	13-Oct-94	13-Oct-94	13-Oct-94
Analysis Date		24-Oct-94	24-Oct-94	24-Oct-94	24-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94	25-Oct-94
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SEMI-VOLATILE COMPOUND	CRQL (ug/L)										
2,4-Dinitrophenol	20	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Dibenzofuran	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrotoluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Nitrophenol	20	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Fluorene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Diethylphthalate	5	5 U	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Nitroaniline	20	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
4,6-Dinitro 2-methylphenol	20	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Pentachlorophenol	20	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Phenanthrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Anthracene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Di-n-butylphthalate	5	5 U	1.1 J	1.1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Fluoranthene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Pyrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Butylbenzylphthalate	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
3,3'-Dichlorobenzidine	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)anthracene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chrysene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
bis(2-Ethylhexyl)phthalate	5	2.7 J	5 UJ	8.4 J	5 U	5 U	5 U	5 U	44	5 U	5 U
Di-n-octyl phthalate	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(b)fluoranthene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(k)fluoranthene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)pyrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Indeno (1,2,3-cd)pyrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibenz(a,h)anthracene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(g,h,i)perylene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

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UJ - The compound was not detected. The compound quantitation limit is an estimated value.
R - The datum was rejected
CRQL - Contract Required Detection Limit

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc
Disk: 7710023-DV04
File: 0013CBNA.WK4

CLP SEMIVOLATILE ORGANIC ANALYSIS
LOW CONCENTRATION WATER ANALYSIS-MODIFIED
DAS CASE 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		EB-GW	GW-11
Traffic Report Number		DAC156	DAC157
Remarks		Equip. Blank	
Sampling Date		05-Oct-94	06-Oct-94
Extraction Date		13-Oct-94	13-Oct-94
Analysis Date		25-Oct-94	25-Oct-94
Dilution Factor		1.0	1.0
SEMI-VOLATILE COMPOUND	CRQL (ug/L)		
bis (2-Chloroethyl) ether	5	5 UJ	5 U
Phenol	5	5 UJ	5 U
2-Chlorophenol	5	5 UJ	5 U
1,3-Dichlorobenzene	5	5 UJ	5 U
1,4-Dichlorobenzene	5	5 UJ	5 U
1,2 Dichlorobenzene	5	5 UJ	5 U
bis (2-Chloroisopropyl) ether	5	5 UJ	5 U
2-Methylphenol	5	5 UJ	5 U
Hexachloroethane	5	5 UJ	5 U
N-Nitroso-di-n-propylamine	5	5 UJ	5 U
4-Methylphenol	5	5 UJ	5 U
Nitrobenzene	5	5 UJ	5 U
Isophorone	5	5 UJ	5 U
2-Nitrophenol	5	5 UJ	5 U
2,4-Dimethylphenol	5	5 UJ	5 U
bis(2-Chloroethoxy)methane	5	5 UJ	5 U
2,4-Dichlorophenol	5	5 UJ	5 U
1,2,4-Trichlorobenzene	5	5 UJ	5 U
Naphthalene	5	5 UJ	5 U
4-Chloroaniline	5	5 UJ	5 UJ
Hexachlorobutadiene	5	5 UJ	5 U
4-Chloro-3-methylphenol	5	5 UJ	5 U
2-Methylnaphthalene	5	5 UJ	5 U
Hexachlorocyclopentadiene	5	5 UJ	5 U
2,4,6-Trichlorophenol	5	5 UJ	5 U
2,4,5-Trichlorophenol	20	20 UJ	20 U
2-Chloronaphthalene	5	5 UJ	5 U
2-Nitroaniline	20	20 UJ	20 U
Acenaphthylene	5	5 UJ	5 U
Dimethylphthalate	5	5 UJ	5 U
2,6-Dinitrotoluene	5	5 UJ	5 U
Acenaphthene	5	5 UJ	5 U
3-Nitroaniline	20	20 UJ	20 U

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UJ - The compound was not detected. The compound quantitation limit is an estimated value.
R - The datum was rejected
CRQL - Contract Required Detection Limit

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc.
Disk: 7710023-DV04
File: 0013CBNA.WK4

CLP SEMIVOLATILE ORGANIC ANALYSIS
LOW CONCENTRATION WATER ANALYSIS-MODIFIED
DAS CASE 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		EB-GW	GW-11
Traffic Report Number		DAC156	DAC157
Remarks		Equip. Blank	
Sampling Date		05-Oct-94	06-Oct-94
Extraction Date		13-Oct-94	13-Oct-94
Analysis Date		25-Oct-94	25-Oct-94
Dilution Factor		1.0	1.0
SEMI-VOLATILE COMPOUND	CRQL (ug/L)		
2,4-Dinitrophenol	20	20 UJ	20 U
Dibenzofuran	5	5 UJ	5 U
2,4-Dinitrotoluene	5	5 UJ	5 U
4-Nitrophenol	20	20 UJ	20 U
Fluorene	5	5 UJ	5 U
4-Chlorophenyl-phenylether	5	5 UJ	5 U
Diethylphthalate	5	5 UJ	5 U
4-Nitroaniline	20	20 UJ	20 U
4,6-Dinitro-2-methylphenol	20	20 UJ	20 U
N-Nitrosodiphenylamine	5	5 UJ	5 U
4-Bromophenyl-phenylether	5	5 UJ	5 U
Hexachlorobenzene	5	5 UJ	5 U
Pentachlorophenol	20	20 UJ	20 U
Phenanthrene	5	5 UJ	5 U
Anthracene	5	5 UJ	5 U
Di-n-butylphthalate	5	5 UJ	5 U
Fluoranthene	5	5 UJ	5 U
Pyrene	5	5 UJ	5 U
Butylbenzylphthalate	5	5 UJ	5 U
3,3'-Dichlorobenzidine	5	5 UJ	5 U
Benzo(a)anthracene	5	5 UJ	5 U
Chrysene	5	5 UJ	5 U
bis(2-Ethylhexyl)phthalate	5	5 UJ	5 U
Di-n-octyl phthalate	5	5 UJ	5 U
Benzo(b)fluoranthene	5	5 UJ	5 U
Benzo(k)fluoranthene	5	5 UJ	5 U
Benzo(a)pyrene	5	5 UJ	5 U
Indeno (1,2,3-cd)pyrene	5	5 UJ	5 U
Dibenz(a,h)anthracene	5	5 UJ	5 U
Benzo(g,h,i)perylene	5	5 UJ	5 U

J - The associated numerical value is an estimated quantity
U - The compound was not detected. The associated numerical value is the compound quantitation limit.
UJ - The compound was not detected. The compound quantitation limit is an estimated value
R - The datum was rejected
CRQL - Contract Required Detection Limit

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc.
Disk: 7710023-DV04
File: 0013CPAR.WK4

CLP PESTICIDE/PCB ORGANIC ANALYSIS
LOW CONCENTRATION WATER ANALYSIS-MODIFIED
DAS CASE 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		GW-02	GW-03	GW-04	GW-05	GW-06	GW 07	GW-08	GW-09	GW 10	GW-11
Traffic Report Number		DAC141	DAC142	DAC143	DAC144	DAC145	DAC146	DAC147	DAC148	DAC149	DAC157
Remarks			DUP DAC141								
Sampling Date		05-Oct-94	05-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94
Extraction Date		10-Oct-94	10-Oct-94	10-Oct-94	10-Oct-94	10-Oct-94	10-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94	12-Oct-94
Analysis Date		26-Oct-94	26-Oct-94	26-Oct-94	26-Oct-94	27-Oct-94	27-Oct-94	27-Oct-94	27-Oct-94	27-Oct-94	27-Oct-94
Dilution Factor		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PESTICIDE/PCB COMPOUND	CRQL										
alpha-BHC	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
gamma-BHC (Lindane)	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Heptachlor	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aldrin	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
beta-BHC	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
delta-BHC	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Heptachlor Epoxide	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Endosulfan I	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
gamma-Chlordane	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
alpha-Chlordane	0.01	0.01 U	0.01 U	0.01 U	R	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4,4'-DDE	0.02	0.02 U	0.02 U	0.02 U	R	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Dieldrin	0.02	0.02 U	0.02 U	0.02 U	R	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin	0.02	0.02 U	0.02 U	0.02 U	R	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endosulfan II	0.02	0.02 U	0.02 U	0.02 U	R	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
4,4'-DDD	0.02	0.02 U	0.02 U	0.02 U	R	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
4,4'-DDT	0.02	0.02 U	0.02 U	0.02 U	R	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endrin aldehyde	0.02	0.02 U	0.02 U	0.02 U	R	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Endosulfan Sulfate	0.02	0.02 U	0.02 U	0.02 U	R	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Methoxychlor	0.10	0.1 U	0.1 U	0.1 U	R	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endrin Ketone	0.02	0.02 U	0.02 U	0.02 U	R	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Toxaphene	1.0	1.0 U	1.0 U	1.0 U	R	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1016	0.20	0.2 U	0.2 U	0.2 U	R	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor-1221	0.40	0.4 U	0.4 U	0.4 U	R	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Aroclor-1232	0.20	0.2 U	0.2 U	0.2 U	R	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor-1242	0.20	0.2 U	0.2 U	0.2 U	R	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor-1248	0.20	0.2 U	0.2 U	0.2 U	R	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Aroclor-1254	0.20	R	R	R	R	R	R	R	R	R	R
Aroclor-1260	0.20	0.2 U	0.2 U	0.2 U	R	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

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UJ - The compound was not detected. The compound quantitation limit is an estimated value.
R - The datum was rejected.
CRQL - Contract Required Detection Limit

Site: Rathe Brothers Landfill
Laboratory: SVL Analytical, Inc.
Disk: 7710023-DV04
File: 0013CPAR.WK4

CLP PESTICIDE/PCB ORGANIC ANALYSIS
LOW CONCENTRATION WATER ANALYSIS-MODIFIED
DAS CASE 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location		EB GW
Traffic Report Number		DAC156
Remarks		Equip. Blank
Sampling Date		05-Oct-94
Extraction Date		12-Oct-94
Analysis Date		27-Oct-94
Dilution Factor		1.0
PESTICIDE/PCB COMPOUND	CRQL	
alpha-BHC	0.01	0.01 U
gamma-BHC (Lindane)	0.01	0.01 U
Heptachlor	0.01	0.01 U
Aldrin	0.01	0.01 U
beta-BHC	0.01	0.01 U
delta-BHC	0.01	0.01 U
Heptachlor Epoxide	0.01	0.01 U
Endosulfan I	0.01	0.01 U
gamma-Chlordane	0.01	0.01 U
alpha-Chlordane	0.01	0.01 U
4,4'-DDE	0.02	0.02 U
Dieldrin	0.02	0.02 U
Endrin	0.02	0.02 U
Endosulfan II	0.02	0.02 U
4,4'-DDD	0.02	0.02 U
4,4'-DDT	0.02	0.02 U
Endrin aldehyde	0.02	0.02 U
Endosulfan Sulfate	0.02	0.02 U
Methoxychlor	0.10	0.1 U
Endrin Ketone	0.02	0.02 U
Toxaphene	1.0	1.0 U
Aroclor-1016	0.20	0.2 U
Aroclor-1221	0.40	0.4 U
Aroclor-1232	0.20	0.2 U
Aroclor-1242	0.20	0.2 U
Aroclor-1248	0.20	0.2 U
Aroclor-1254	0.20	R
Aroclor-1260	0.20	0.2 U

J - The associated numerical value is an estimated quantity.
U - The compound was not detected. The associated numerical value is the compound quantitation limit.
UJ - The compound was not detected. The compound quantitation limit is an estimated value.
R - The datum was rejected.
CRQL - Contract Required Detection Limit

Data Summary Key

A - Acceptable data.

J - The associated numerical value is an estimated quantity.

U - The compound was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

R - Reject data because quality control criteria were exceeded. The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.

ATTACHMENT D

RATHE BROTHERS' LANDFILL

INORGANIC GROUNDWATER SAMPLE ANALYTICAL RESULTS
CDM FEDERAL PROGRAMS CORPORATION

OCTOBER 5, 1994
(sampling date)

Site: Rathe Brothers
Laboratory: SVL Analytical Inc.
Disk: 7710023-DV06
File:0013Clcm.WK4

CLP INORGANIC ANALYSIS
CASE 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location				DAC141	DAC142	DAC143	DAC144	DAC145	DAC146	DAC147	DAC148	DAC149
Traffic Report Number				GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09	GW-10
Remarks					Dup.DAC141							
Sampling Date				05-Oct-94	05-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94	06-Oct-94
Dilution Factor				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
INORGANIC ANALYTES		CRDL (ug/L)	IDL (ug/L)									
Aluminum	P	100	28.4	3970	4170	28.4 U	28.4 U	92.1 U	28.4 U	28.4 U	28.4 U	28.4 U
Antimony	F	5	0.4	0.40 U	0.40 U	1.0	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Arsenic	F	2	1.2	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ
Barium	P	20	1.1	36.8	36.8	34.5	13.4	15.4	13.8	48	73.5	44.3
Beryllium	P	1	0.3	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U
Cadmium	P	1	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Calcium	P	500	27.5	49200	49100	125000	39400	38400	38800	34400	36300	41500
Chromium	P	10	3.7	9.4	20.1	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Cobalt	P	10	4.6	6.2 UJ	7.3 UJ	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	4.6 U
Copper	P	10	2.8	10.4 U	13.6 UJ	3.1 UJ	26.1 U	3.1 U	3.7 U	2.8 U	2.8 U	2.8 U
Iron	P	100	6.5	7220	7330	54.4 U	11.1 UJ	277	30.5 U	1410	311	551
Lead	F	2	0.9	3.3 U	3.1 U	0.90 U	0.94	0.90 U	0.90 U	1.6	0.90 U	0.90 U
Magnesium	P	500	34.3	19300	19300	66900	23200	24200	23500	16700	12800	30100
Manganese	P	10	1.7	315	300	1.7 U	1.7 U	5.5 U	1.7 U	106	162	9.4 U
Mercury	CV	0.2	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	P	20	16.7	16.7 U	27.8 J	16.7 U	16.7 U	16.7 U	16.7 U	16.7 U	16.7 U	16.7 U
Potassium	P	750	530	1980	2390	1540	1690	1830	1880	1270	1670	1010 J
Selenium	F	3	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Silver	P	10	3.6	3.6 U	3.7 UJ	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Sodium	P	500	27.4	6860	6860	120000	8580	8500	8550	2860	10400	5720
Thallium	F	10	0.9	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 U	0.90 UJ	0.90 U	0.90 U
Vanadium	P	10	3.7	5.4 J	7.9	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Zinc	P	20	2.6	24.0 U	27.2 U	65.6 U	38.2 U	29.5 U	8.7 U	3.3 UJ	12.0 U	3.3 UJ
Cyanide	CA	10	10	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

Analytical Method
F Furnace
P ICP/Flame AA
CV Cold Vapor
CA Midi-Distillation Spectrophotometric Analysis

J - The associated numerical value is an estimated quantity.
U - The analyte was not detected. The associated numerical value is the analyte detection limit.
UJ - The analyte was not detected. The analyte detection limit is an estimated value
IDL- Instrument Detection Limit
CRDL- Contract Required Detection Limit

Site: Rathe Brothers
Laboratory: SVL Analytical Inc
Disk: 7710023-DV06
File:0013Clcm.WK4

CLP INORGANIC ANALYSIS
CASE 0013C, SDG DAC140
AQUEOUS ANALYTICAL RESULTS (ug/L)

Sample Location				DAC156	DAC157
Traffic Report Number				EB-GW	GW-11
Remarks				Equip.blank	
Sampling Date				05-Oct-94	06-Oct-94
Dilution Factor				1.0	1.0
INORGANIC ANALYTES		CRDL (ug/L)	IDL (ug/L)		
Aluminum	P	100	28.4	28.4 U	130 U
Antimony	F	5	0.4	0.40 U	0.40 U
Arsenic	F	2	1.2	1.2 UJ	1.2 UJ
Barium	P	20	1.1	1.1 U	84.3
Beryllium	F	1	0.3	0.30 U	0.30 U
Cadmium	P	1	0.2	0.20 U	0.20 U
Calcium	P	500	27.5	33.6 J	84800
Chromium	P	10	3.7	3.7 U	3.7 U
Cobalt	P	10	4.6	4.6 U	4.6 U
Copper	P	10	2.8	3.7 J	6.2 U
Iron	P	100	6.5	39.2	323
Lead	F	2	0.9	0.9 U	2.1 U
Magnesium	P	500	34.3	34.3 U	39700
Manganese	P	10	1.7	2.9 J	548
Mercury	CV	0.2	0.2	0.20 U	0.20 U
Nickel	P	20	16.7	16.7 U	16.7 U
Potassium	P	750	530	530 U	833 J
Selenium	F	3	1.0	1.0 U	1.0 UJ
Silver	P	10	3.6	3.6 U	3.6 U
Sodium	P	500	27.4	28.2 J	17400
Thallium	F	10	0.9	0.90 U	0.90 U
Vanadium	P	10	3.7	3.7 U	3.7 U
Zinc	P	20	2.6	2.6 U	2.6 U
Cyanide	CA	10	10	10.0 U	10.0 U

Analytical Method
F Furnace
P ICP/Flame AA
CV Cold Vapor
CA Midi-Distillation Spectrophotometric Analysis

J - The associated numerical value is an estimated quantity.
U - The analyte was not detected. The associated numerical value is the analyte detection limit
UJ - The analyte was not detected. The analyte detection limit is an estimated value.
IDL - Instrument Detection Limit
CRDL - Contract Required Detection Limit

Data Summary Key

A - Acceptable data.

J - The associated numerical value is an estimated quantity.

U - The compound was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.

UJ - The compound was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

R - Reject data because quality control criteria were exceeded. The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.