CORPORATE
FACILITIES & ASSET MANAGEMENT

UNISYS CORPORATE ENVIRONMENTAL AFFAIRS
3199 PILOT KNOB ROAD - MS F1B05
EAGAN, MN 55121

TELEPHONE
651 687 3280

UNISYS

June 13, 2002

Tom Koch
New York State Department of Environmental Conservation
Bureau Hazardous Site Control
625 Broadway
14th Floor
Albany, New York 12233-7014

Subject: Petition for Deletion of Site from Registry
Former Burroughs\Unisys Facility
NYSDEC Site #8-28-075
Rochester, Monroe County, New York

Dear Mr. Koch:

The purpose of this correspondence is to forward to the New York State Department of Environmental Conservation (NYSDEC), two (2) copies of the **Petition for Deletion of Site from Registry** for the Former Burroughs Facility located at 1225 Ridgeway Avenue, Rochester, New York, NYSDEC Site #8-28-075. This transmittal consists of an Affidavit and supporting documents for Unisys Petition for deletion of the Site from the Registry of Inactive Hazardous Waste Disposal Sites (Registry). I have forwarded two (2) copies of the **Petition for Deletion of Site from Registry** to the NYSDEC Project Manager, Mr. Todd Caffoe in the Avon Office.

If you have any questions, or need additional copies of this document, please contact me at (651) 687-3279, or via e-mail at keith.rapp@unisys.com.

Sincerely,

Keith B. Rapp
UNISYS
Corporate Environmental Affairs
Program Manager

cc: David Noble, Esq. -Unisys\Blue Bell
Christopher McKenzie, Esq. -Beveridge & Diamond\New York

ROCHESTER\CORRESPO\NYSDEC\DELISTING_COVER3\061302\KBR

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

UNISYS CORPORATION, Petitioner.	:	NYSDEC Site No. 8-28-075 **PETITION FOR DELETION OF SITE FROM REGISTRY**

AFFIDAVIT OF KEITH B. RAPP IN SUPPORT OF PETITION

STATE OF NEW YORK)
) ss.:
COUNTY OF SUFFOLK)

KEITH B. RAPP, being duly sworn, deposes and says:

1. I am the Environmental Program Manager in the Corporate Environmental Affairs department at Unisys Corporation ("Unisys"), a corporation that was formed out of the merger of Burroughs Corporation, the former lessee and operator of the Former Burroughs-UNISYS Facility Site in Rochester, New York, NYSDEC Site No. 8-28-075 (the "Site"), and Sperry Corporation in 1986.

2. I make this Affidavit in support of Unisys's Petition for deletion of the Site from the Registry of Inactive Hazardous Waste Disposal Sites ("Registry") referenced in New York Environmental Conservation Law ("ECL") 27-1305. I am familiar with the Site and have direct and personal knowledge of the facts set forth herein and the exhibits hereto.

3. Since January 1999, the Site has been classified as Class 4 (properly closed but requires continued monitoring). Post-remedial monitoring has continued since 1998 and demonstrates achievement of remedial action objectives.

4. Unisys now requests that NYSDEC delete the Site from the Registry because the

selected remedy has been successfully implemented and further monitoring is not warranted.

5. Where a document is cited to or referenced in this Affidavit, the relevant portion of that document has been attached as an exhibit hereto, together with the document's front page and table of contents. NYSDEC has complete copies of all the documents cited herein, but additional copies are available upon request.

Site Description and History

6. The Site is located at 1225 Ridgeway Avenue, Rochester, New York, and is owned by Dimino Management, Inc. See 2001 Annual Monitoring Report, Former Burroughs-Unisys Facility ("2001 Report") (attached hereto as Exhibit A), Figure 1 (Site Location Map).

7. The area surrounding the Site is primarily zoned industrial/commercial. The site is bounded to the north by a large parcel owned by Eastman Kodak Company, to the east by commercial businesses, to the south and southwest by undeveloped parcels owned by 3M Corporation, and to the west by a parcel owned by Dimino Management, Inc. See id.

8. Located on the Site are a manufacturing building, office building and a warehouse/storage building. Several businesses currently occupy these buildings under lease. The site is mostly covered with asphalt, concrete, or buildings, with only a few small grass covered areas. See Exhibit A, Figure 2 (Site Plan).

9. Since the beginning of industrial activity at this site in 1968, solvents have been used for manufacturing various products at the Site. The primary solvents used in manufacturing processes at the Site have included isopropyl alcohol ("IPA"), methyl ethyl ketone ("2-butanone" or "MEK"), toluene and methanol. These solvents were stored in five underground storage tanks ("USTs") in the northeast corner of the site. See id.

10. Burroughs Corporation manufactured carbon copy paper, printer ribbons and other office supply products at the Site from 1976 to 1986. Although Burroughs sold its business operations in 1986 to NuKote International, similar manufacturing operations and chemical use continued at the facility.

11. In 1985, prior to the sale of its operations to NuKote International, Burroughs conducted investigations showing that soil and groundwater had been impacted beneath the site. See Focused Evaluation of Remedial Alternatives, Former Burroughs-Unisys Facility (Unisys Corp. Oct. 15, 1997) (attached hereto as Exhibit B) at § 2.2.

12. Historical records and environmental investigations show that between 1986 and 1992, IPA, methanol, MEK, and toluene were the only chemicals stored in the former USTs. See Draft Remedial Investigation Report for Former Burroughs Unisys Facility (Unisys Corp., 1992) (attached hereto as Exhibit C), at 8. These stored chemicals are four of the five constituents of concern identified in the Record of Decision ("ROD") as site-specific indicator compounds ("SSICs"). See NYSDEC Record of Decision, March 1994 (attached hereto as Exhibit D), Table 1 (Summary of Soil Results). Acetone, the fifth SSIC, was not stored at the facility. The presence of acetone has been attributed to the subsurface biodegradation of IPA. See Investigation of Groundwater Quality Conditions at the Nu-Kote International (Formally Burroughs, Inc.) Facility, Phase II (Geraghty & Miller, 1988) (attached hereto as Exhibit E) at 13.

13. The five USTs were removed in 1986. See UST Removal Report (Unisys Corp., July 1991). Subsequent to the removal of the five USTs, four new 5000-gallon double-walled tanks with leak detection were installed approximately 50 feet from the excavated USTs. The new tanks store IPA, MEK, and toluene. See id.

Remediation Status

14. Numerous investigations were conducted between 1986 and 1990 to determine the extent of soil and groundwater contamination beneath the Site, including the Investigation of Groundwater Quality Conditions at the Nu-Kote International (Formally Burroughs, Inc.) Facility (Geraghty & Miller, 1987), Investigation of Groundwater Quality Conditions at the Nu-Kote International (Formally Burroughs, Inc.) Facility, Phase II (Geraghty & Miller, July 1988), Report on Monitoring Well Sampling and Analysis (Dames & Moore, 1989), and Vacuum Extraction Pilot Test Report (Terra Vac Corporation, 1989). See Exhibit B at §§ 2.3-2.4.

15. The Site was listed on the New York State Registry of Inactive Hazardous Waste Disposal Sites on January 17, 1989.

16. Unisys signed a NYSDEC Order on Consent in February 12, 1990. The Order on Consent required Unisys to complete a Remedial Investigation and Feasibility Study ("RI/FS") for the Site.

17. Interim Remedial Measures ("IRMs") were implemented for the soil and groundwater in the vicinity of the former solvent UST tank cavity, in accordance with the Operation Work Plan for the Interim Remedial Measures (Bruck, Hartman, and Esposito ("BHE"), 1990). See Exhibit B at § 2.3. The IRMs included installation of 43 groundwater/soil vapor extraction ("GW/SVE") points. The GW/SVE system began operating in November 1990, and effectively controlled groundwater flow and contaminant migration. See id at § 4.4.

18. The Remedial Investigation ("RI") was conducted in phases, addressing NYSDEC input. The results of the RI were reported in the Draft Remedial Investigation Report (Unisys, Nov. 1992); Addendum Remedial Investigation Report (Integrated Environmental Solutions, Inc.

("IES"),1993); and Addendum II, Remedial Investigation Report (IES, May 1993). These documents have been adopted collectively by NYSDEC as the Final Remedial Investigation Report.

19. The RI further characterized the extent of soil and groundwater contamination at the site and evaluated potential risks to human health and the environment. In addition, the RI identified the hydrogeologic characteristics of the Site, which include observed groundwater flow from the former UST basin toward monitoring well GM-5. See Exhibit A, Appendix B (Groundwater Monitoring Well Hydrographs).

20. Pursuant to the Administrative Order on Consent, the Feasibility Study ("FS") was completed and submitted by IES in August 1993.

21. After evaluating and approving the RI/FS, NYSDEC selected a remedial plan in a ROD dated March 1994. The selected remedy included enhancements and modifications to the existing IRM GW/SVE system, as well as post-remediation monitoring (Alternative 5 in the ROD). See Exhibit D at Section 7.

22. The ROD also developed Remedial Action Objectives ("RAOs") for soil and groundwater, based on the NYSDEC TAGM-4046 (Determination of Soil Clean Up Objectives and Clean Up Levels), 10 NYCRR Part 5 and 6 NYCRR Part 700. See Exhibit D at Section 7. For the SSICs, the RAOs are as follows:

SSIC	**Soil RAO (ppm)**	**Groundwater RAO (ppb)**
Acetone	0.11	50
Isopropyl Alcohol (IPA)	0.11	50
Methanol	0.11	50
2-Butanone (MEK)	0.23	50
Toluene	1.5	5

23. In response to the ROD, Unisys prepared a Remedial Design ("RD") for the Former Burroughs-Unisys Facility (BHE, March 1995) describing the system modifications and enhancements. The IRM modifications and enhancements included installation of five additional GW/SVE wells, as well as cycling, evaluation of pulsing, and evaluation of passive air or active water injection to assist fluid migration.

24. After installing the new wells, the system was restarted in May 1995, and was operated through November 1996 on a cycling and pulsing schedule designed to enhance the remediation of previously identified areas impacted by VOCs. Monitoring and system performance data are presented in the Annual Performance Report of Remedial Activities for Former Burroughs-Unisys Facility (BHE, September 1996).

25. The GW/SVE remediation system resulted in a significant reduction of SSICs, indicating that further action at the Site should be restricted to a groundwater monitoring-only program with the exclusive goal of demonstrating that the remedial actions and water quality conditions are protective of human health and the environment.

26. As approved by NYSDEC, the GW/SVE treatment system terminated operations in March 1997, and was decommissioned under the supervision of Day Environmental and NYSDEC in the fall of 1998. See 1998 Annual Monitoring Report for Former Burroughs-Unisys Facility (attached hereto as Exhibit F) at § 1.4.

27. As part of the 1998 GW/SVE system demolition, the treatment plant components were removed, 67 extraction and monitoring wells were abandoned, and certain wells were modified to allow their use as groundwater monitoring locations. See id.

28. Effective January 8, 1999, following the decommissioning of the GW/SVE

system, NYSDEC changed the Site's classification on the Registry from Class 2 (constitutes a significant threat) to Class 4 (properly closed but requires continued operation, maintenance, and/or monitoring). See 6 NYCRR 375-1.8(a)(2).

Post-Remediation Sampling

29. The Site's current post-remediation groundwater monitoring program (the "Monitoring Program") monitors groundwater downgradient of the former UST area, where low levels of VOCs were detected after the remediation system was shut down in March 1997. The Monitoring Program was designed to collect data concerning the groundwater conditions principally in the area of well GM-5, which is essentially the only location to detect any SSICs since March 1997. See Exhibit A, Appendix C (Historical Groundwater Quality Summary).

30. The Monitoring Program employs 8 groundwater sampling locations. See Exhibit A, Figure 2 (Site Map).

31. The sampling locations and frequency utilized in the Monitoring Program since 1998 are as follows:

Location	1998		1999				2000				2001			
	Monthly	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
GM-3	X	X	X	X	X	X		X		X			X	
GM-3D		X	X	X	X	X		X		X			X	
GM-5	X	X	X	X	X	X		X		X			X	
GM-8	X	X	X	X	X	X		X		X			X	
GW-10	X	X	X	X	X	X		X		X			X	
MW-13	X	X	X	X	X	X		X		X			X	
MW-13D	X	X	X	X	X	X		X		X			X	
MW-13DD		X	X	X	X	X		X		X			X	

32. Groundwater samples have been analyzed for all SSICs at the Site at all these wells since March 1993, and such sampling has been conducted consistently through September 2001. In addition, most of these wells have been sampled regularly since February 1987. See Exhibit A, Appendix C (Historical Groundwater Quality Summary).

33. Since February 1998, groundwater sampling has detected no SSICs at or above the method detection limit ("MDL") for any monitoring wells except well GM-5. See Exhibit A, Appendix C (Historical Groundwater Quality Summary).

34. With the exception of one detection of Acetone in GM-10 in February 1998 and one detection of Acetone in GM-3D in December 1994, GM-5 is the only well in which SSICs have been detected since March 1993. See id.

35. A trend review of the SSICs at well GM-5 indicates a continued drop in concentrations at that well since the shutdown of the GW/SVE system and the beginning of the post-remediation period on March 25, 1997. See Exhibit A, Figure 7 (Well GM-5 Total VOC Concentrations – Post Remediation).

36. The trend review of SSICs at well GM-5 also demonstrates that there has been no post-remediation rebound of VOC concentrations since the remediation system ceased operations. See id.

37. The influence of the rebound of the water table at GM-5 upon the cessation of the remediation system also has not resulted in an increase in VOC concentrations. See Exhibit A, Figure 8 (GM-5 Total VOCs vs. Groundwater Elevation).

38. The Mann-Whitney statistical analysis for groundwater concentrations of acetone at well GM-5 shows a decreasing trend, substantially below the MDL. The Mann-Whitney

statistical analysis indicates no increasing trend for IPA, MEK, 2-butatone, or toluene at well GM-5. See Exhibit A, Figures 9-13.

39. Since June 24, 1999, groundwater sampling at all of the monitoring wells at the Site has detected no SSICs at or above the MDL, with the exception of a single measurement of toluene at 170 parts per billion (ppb) in November 2000 at well GM-5. See Exhibit A, Appendix C (Historical Groundwater Quality Summary).

40. The November 2000 detection of toluene is not sufficient to distort the statistical trend for toluene emissions, which shows no increasing trend at the 90% confidence interval for well GM-5. A linear regression analysis for toluene concentrations at well GM-5 shows a clear trend of decreasing toluene concentrations at GM-5. See Exhibit A, Figure 14 (GM-5 Linear Regression Analysis).

41. The most recent sampling event in September 2001 detected no SSICs at or above the MDL at any of the monitoring wells, including GM-5. See Exhibit A, Figure 5 (Groundwater Quality Monitoring).

42. Other than the single detection of toluene in November 2000, no SSICs have been detected at or above MDLs in nearly three years at well GM-5. No SSICs have been detected in four of the last five sampling events at well GM-5, and none have been detected at any other well in over four years. See Exhibit A, Appendix C.

43. Based on the extensive groundwater monitoring data prior to and following remediation of the Site, and the statistical analyses of these data, it is apparent that the GW/SVE treatment system has successfully remediated the Site, and the RAOs contained in the NYSDEC ROD have been achieved.

44. The data indicate that the Site no longer constitutes a significant threat to the environment pursuant to 6 N.Y.C.R.R. § 375-1.4, and it is not reasonably foreseeable that the Site will constitute a significant threat in the future.

45. Unisys accordingly requests that NYSDEC delete the Site from the Registry, as no further operation, maintenance, or monitoring of the Site is warranted.

Keith B. Rapp

Sworn to me this
15 day of May, 2002

Notary Public

RITA K KUNZ
Notary Public
Minnesota
My comm. expires 01-31-2005

N:\00\55\11174\Misc\mxs delisting edits 5-9-2002.wpd

UNISYS

2001 Annual Monitoring Report

Former Burroughs-Unisys Facility
1225 Ridgeway Avenue
Rochester, New York

NYSDEC SITE #82-8-075

February 14, 2002

Prepared for:
New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road, Remedial Section C
Albany, New York 12233-7010

Prepared by:

UNISYS
Corporate Environmental Affairs
3199 Pilot Knob Road
Eagan, MN 55121

UNISYS

2001 Annual Monitoring Report

Former Burroughs-Unisys Facility
1225 Ridgeway Avenue
Rochester, New York

NYSDEC SITE #82-8-075

February 14, 2002

Prepared for:
New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road, Remedial Section C
Albany, New York 12233-7010

Prepared by:

UNISYS
Corporate Environmental Affairs
3199 Pilot Knob Road
Eagan, MN 55121

Table of Contents

List of Tables

List of Figures

Appendices

2001 Annual Monitoring Report
Former Burroughs-Unisys Facility
1225 Ridgeway Avenue
Rochester, New York
NYSDEC Site #8-28-075

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to provide the New York State Department of Environmental Conservation (NYSDEC) with a project status report for the 2001 Groundwater Monitoring Program at the Former Burroughs Facility located at 1225 Ridgeway Avenue, Rochester, New York.

With the successful completion of the Interim Measures (IMs), NYSDEC and Unisys entered into Administrative Order on Consent (AOC), Index #B8-0262-89-03, which outlined a Scope of Work to be completed at the site. This work ultimately lead to the shutdown of the Groundwater/Soil Vapor Extraction (GW/SVE) treatment system on March 25, 1997, with NYSDEC approval, as recommended in the *Focused Evaluation of Remedial Alternatives Report* (Unisys, October 15, 1997).

The GW/SVE was in operation from November 1990 through March 25, 1997. The NYSDEC approval of the system shut-down was subject to a **"groundwater monitoring only"** corrective action alternative to evaluate the groundwater quality conditions at the site for five years after the system shutdown. This report presents the findings of the sampling conducted in 2001, the fifth year post-shutdown of the GW/SVE treatment system. This is the fifth annual groundwater monitoring report for this site.

1.2 SITE LOCATION AND DESCRIPTION

The Former Burroughs Facility is located at 1225 Ridgeway Avenue, Rochester, New York. The location of the site is shown on Figure 1. The area surrounding the site is primarily zoned industrial/commercial. The site is bounded to the north by a large parcel owned by Eastman Kodak Company, to the east by commercial business, to the south and southwest by undeveloped parcels owned by 3M Corporation, and to the west by a parcel owned by Dimino Management, Inc.

The site plan is illustrated in Figure 2. The Ridgeway Avenue site consists of a manufacturing building, office building and a warehouse/storage building. Several businesses currently occupy these buildings under lease to Ridgeway Industrial Properties. The site is mostly covered with asphalt, concrete, or buildings, with only a few small grass covered areas. The location of buildings, treatment system, roadways, monitoring wells, and the GW/SVE system are shown on Figure 2.

1.3 SITE HISTORY

Since the beginning of industrial activity at this site in 1968, solvents have been used for manufacturing carbon copy paper, printer ribbons and other office supply products. Burroughs manufactured these products at this facility from 1976 to 1986. Although Burroughs sold the business operations in 1986 to NuKote International, similar manufacturing operations and chemical use continued at the facility. A more detailed discussion of the property including ownership and lease agreements is presented in the *Remedial Investigation Report* (Unisys, 1992).

Primary solvents used in the manufacturing process included isopropyl alcohol (isopropanol or IPA), methyl ethyl ketone (2-butanone or MEK), toluene and methanol. These solvents were stored in underground storage tanks (USTs) in the northeast corner of the site (Figure 2). Historical records and environmental investigations revealed that between 1986 and 1992, IPA, methanol, MEK, and toluene were the only chemicals stored in the former USTs. In 1985 it was discovered that soil and groundwater had been impacted beneath the site. These stored chemicals are four of the five constituents of concern identified in the ROD as site-specific indicator compounds (SSICs). The SSICs and NYSDEC regulations were used to develop the remedial action objectives (RAOs) for soil and groundwater. Acetone, the fifth SSIC, was not stored at the facility. The presence of acetone has been attributed to the subsurface biodegradation of IPA (Unisys, October 30, 1998).

1.4 REMEDIATION STATUS

The Record of Decision (ROD) (NYSDEC, March 1994) identified a remediation plan after evaluating and approving the *Remedial Investigation/Feasibility Study* (RI/FS). NYSDEC selected enhancements and modifications (Alternative 5 in the ROD) to the Interim Remedial Measures (IRM) GW/SVE system. In cooperation with NYSDEC, Unisys developed and implemented the *Remedial Design* (RD) in response to the ROD, finalized in March 1995 (BHE, March 10, 1995).

The selected remedial alternative included continued operation of the IRM with documented modifications that included installation of five additional GW/SVE wells, and enhancements that included cycling, evaluation of pulsing, and evaluation of passive air or active water injection to assist fluid migration. The wells (SV-41 through SV-45) shown on Figure 2, were added to the existing GWE\SVE extraction network on May 16, 1995, and the system was restarted on May 30, 1995. After restarting, the system operated on a cycling and pulsing schedule designed to enhance the remediation by allowing soil flushing of the areas impacted by volatile organic compounds (VOCs). The GW/SVE treatment system terminated operations March 25, 1997. In the fall of 1998, the GW/SVE treatment system was decommissioned under the supervision of Day Environmental and NYSDEC. The decommissioning was reporting in the *1998 Annual Monitoring Report* (Unisys, 1998). Subsequent groundwater monitoring was documented in the *2000 Annual Monitoring Report* (Unisys, April 13, 2001), and this report.

1.5 REMEDIAL ACTION OBJECTIVES

The soil RAOs, which are stated in the ROD, reflect the NYSDEC-TAGM-4046 *Determination of Soil Clean Up Objectives and Clean Up Level* criteria. These groundwater RAOs reflect the standards outlined in 10NYCRR Part 5 and 6NYCRR Part 700. For the SSICs they are as follows:

SSIC	Soil RAO (ppm)	Groundwater RAO (ppb)
Acetone	0.11	50
Isopropyl Alcohol (IPA)	0.11	50
Methanol	0.11	50
2-Butanone (MEK)	0.23	50
Toluene	1.5	5

Remedial Action Objective Soil Concentrations using TAGM 4046

These RAOs are used to evaluate the progress of the cleanup in the soil and groundwater environment.

2.0 2001 ACTIVITIES

As mandated by the Environmental Conservation Law (ECL), NYSDEC maintains a Registry of all Inactive Hazardous Waste Disposal Sites. Effective January 8, 1999, the Classification for this site was changed from a **Class II** to a **Class IV** site. The requirements for changing classification to a **Class IV** site indicates the site has been properly closed, but conditions require continued operation, maintenance, and/or monitoring. The successful GW/SVE remediation system resulted in a significant reduction of the SSICs, indicating that continued monitoring at the site is properly restricted to a **groundwater monitoring only program**. The long-term groundwater sampling program monitors groundwater downgradient of the former UST area, where low levels of VOCs were detected after the remediation system was shut-down in March 1997. This post-remediation groundwater monitoring program was designed to collect the appropriate data concerning the groundwater conditions at and downgradient of the former UST basin, principally in the area of well GM-5, which is essentially the only location to detect VOCs since March 1997. The goal of the post-remediation groundwater monitoring program is to demonstrate the remedial actions and water quality conditions are protective of the soil and groundwater conditions of the state of New York.

2.1 GROUNDWATER MONITORING WELL NETWORK

In November 1998, 67 (sixty-seven) groundwater monitoring and SVE extraction points were abandoned at the site. The resulting groundwater monitoring network was reduced to 8 sampling locations in the bedrock groundwater flow system. The monitoring well completion details for these eight wells are highlighted below:

Location	Top of Casing (TOC in ft-AMSL)	Depth of Borehole (ft)	Casing Diameter (in)	Casing material	Screen Material	Screen Length (ft)	Total Well Depth (below TOC - ft)
GM-3	**505.61**	18.95	2	PVC	PVC	10	18.95
GM-3D	**505.48**	38.26	2	PVC	PVC	10	38.26
GM-5	**505.23**	16.27	2	PVC	PVC	10	16.27
GM-8	**505.45**	16.00	4	PVC	PVC	10	15.70
GM-10	**505.52**	15.00	4	PVC	PVC	10	14.32
MW-13	**505.21**	12.70	2	PVC	PVC	5	12.70
MW-13D	**505.50**	40.00	2	PVC	PVC	10	40.00
MW-13DD	**505.19**	60.50	2	PVC	PVC	10	60.50

2.2 SITE GEOLOGY

Pleistocene-age glacial lake sediments composed predominantly of brown-to-tan clayey silt with occasional fine sand overlie shale and limestone bedrock. These sediments generally range in thickness from approximately 10 to 20 feet. The Irondequoit Limestone Formation underlies the overburden and consists of interbedded dark gray-to-black calcareous shale, and gray-to-light gray dolomite and crystalline limestone. A thin weathered portion of the Rochester Shale Formation was identified above the limestone. The shale appears to be present across most of the site with a maximum thickness of approximately five feet. Bedrock is reported to have a slight regional dip to the south. On-site, the bedrock surface slopes to the east with bedrock highs to the north and west portions of the site.

2.3 SITE HYDROGEOLOGY

Two hydrogeologic units have been identified and monitored at the site. These include a water bearing zone in the overburden clay and silt, and the bedrock aquifer comprising of the Irondequoit Formation. The bedrock aquifer is monitored by wells with screened intervals ranging from 12 to 60 feet bgs. Eight (8) monitoring wells are currently used for monitoring groundwater quality and water level measurements. The wells are shown on Figure 3. Table 1 provides the groundwater levels measurements collected in 2001.

Groundwater level measurement were collected September 18, 2001. Depths to groundwater in 2001 range from a high water level of 7.46 feet in the well MW-10, to a low water level of 36.80 feet in monitoring well MW-13DD. In general, the water levels were deeper in the shallow bedrock wells, and shallower in the deep bedrock wells, as compared to 2000 potentiometric levels. The hydraulic gradient across the site measured during the monitoring period revealed:

Date	Horizontal Hydraulic Gradient
September 2001	**0.013**

Figure 4 depicts the groundwater contour map and flow direction in September 2001. This flow direction is consistent with the historical flow patterns measured at the site, with groundwater flow from the former UST basin toward monitoring well GM-5.

Historical measurements have indicated a steep downward hydraulic gradient in nested wells on-site. The measured vertical hydraulic gradient measurements for 2001 are presented below, consistent with historical data:

	Vertical Hydraulic Gradient GM-3/GM-3D	Vertical Hydraulic Gradient MW-13/MW-13D
September 2001	**0.606481**	**0.679435**

Historical groundwater elevation data are presented in Appendix A. Groundwater monitoring well hydrographs are included in Appendix B.

2.4 GROUNDWATER SAMPLING

Figure 3 presents the post-remediation groundwater monitoring network. As part of the 1998 GW/SVE system demolition, the treatment plant components and 67 extraction and monitoring wells were abandoned. The wellheads of monitoring wells GM-3, GM-8, and GM-10 were modified (cut-off below grade and equipped with at-grade curb boxes) to allow their use as groundwater monitoring locations. The post-remediation groundwater level and water quality sampling locations in the post-remediation monitoring program are listed below:

Location	1998		1999				2000				2001			
	Monthly	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
GM-3	X	X	X	X	X	X		X		X			X	
GM-3D		X	X	X	X	X		X		X			X	
GM-5	X	X	X	X	X	X		X		X			X	
GM-8	X	X	X	X	X	X		X		X			X	
GW-10	X	X	X	X	X	X		X		X			X	
MW-13	X	X	X	X	X	X		X		X			X	
MW-13D	X	X	X	X	X	X		X		X			X	
MW-13DD		X	X	X	X	X		X		X			X	

X – indicates sampling location and period

The 2001 groundwater quality sampling locations are listed below:

Location	2001
	Sept-19
GM-3	X
GM-3D	X
GM-5	X
GM-8	X
GW-10	X
MW-13	X
MW-13D	X
MW-13DD	X

X – indicates sampling location and period

Appendix A presents the historical groundwater elevation summary. Figure 4 presents the potentiometric contour map for water levels measured in September 2001. Review of potentiometric surface maps generated from 1987 through 2001 show flow in the bedrock has been consistently to the northeast with an approximate hydraulic gradient of 0.005 to 0.05. Horizontal and vertical hydraulic gradients measured in 2001 are consistent with the historical data trends in the bedrock aquifer in 2001. Well hydrographs, representative of groundwater fluctuations at the site are provided in Appendix B.

2.5 VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER

Historical water quality results are provided in Appendix C for all monitoring wells in the long-term groundwater monitoring program. Table 2 provides the results of the September 19, 2001, groundwater sampling event. Groundwater samples have been analyzed for the SSICs beginning in 1987, and remained consistent through the September 2001, sampling event.

Figure 5 presents the September 2001, groundwater quality sampling for the long-term monitoring wells. In September 2001, there were no detection of SSICs at or above the method detection limit (MDL). Groundwater samples were analyzed for non-halogenated volatile organics by GC, purgeables, EPA Test Method 624.

4 Year Post-Remediation Groundwater Monitoring Results – GM-5

Location	Date	2-Butanone	Acetone	Isopropanol	Methanol	Toluene	Total VOCs
GM-5	26-Jan-98	< 50	< 50	< 100	< 1000	24	24
GM-5	25-Feb-98	< 50	< 50	< 100	< 1000	79	79
GM-5	24-Mar-98	< 50	< 50	< 100	< 1000	270	270
GM-5	28-Apr-98	< 20	< 20	< 180	< 110	100	100
GM-5	27-May-98	< 20	< 20	< 98	< 110	35	35
GM-5	23-Jun-98	< 67	< 67	< 98	< 110	430	430
GM-5	30-Jul-98	< 40	< 40	< 98	< 110	380	380
GM-5	31-Aug-98	< 40	73	< 100	< 100	290	363
GM-5	30-Sep-98	< 400	< 400	< 100	< 100	600	600
GM-5	29-Dec-98	< 100	< 40	< 100	< 100	300	300
GM-5	03-Mar-99	< 50	< 50	< 100	< 100	59	59
GM-5	24-Jun-99	< 50	< 50	< 100	< 100	360	360
GM-5	02-Nov-99	< 20	< 20	< 500	< 500	< 5	0
GM-5	14-Dec-99	< 100	< 40	< 100	< 100	< 5	0
GM-5	14-Apr-00	< 20	< 20	< 1000	< 1000	< 5	0
GM-5	21-Nov-00	< 20	< 20	< 1000	< 1000	170	170
GM-5	19-Sep-01	< 20	< 20	< 1000	< 1000	< 5	0

Toluene has essentially been the only compound detected over the last four years (since 1998). Table 2 provides the results of the September 2001, groundwater sampling for SSICs at the site

Figure 6 plots the historical Total VOC concentrations detected in well GM-5 since the initiation of groundwater sampling through 2001. During this sampling event, no VOCs were detected in groundwater. A trend review of SSICs at monitoring well GM-5 indicates a continued drop in concentrations since the shutdown of the GW/SVE on March 25, 1997 (Figure 7). Figure 7 depicts no post-remediation rebound of VOC concentrations since the remediation system ceased operations. Additionally, the influence of the rebound of the water table at GM-5 with the cessation of remediation has not resulted in an increase in VOC concentrations, as depicted in Figure 8.

- Figure 9 depicts the acetone concentrations on a logarithmic scale with 1/2 the general MDL highlighted, which indicates the past 8 sampling rounds are less than the MDL. Statistical analysis with the Mann-Whitney U Statistical Test (Appendix D) indicates that the trend for acetone is **decreasing**.
- Figure 10 depicts the isopropanol concentrations on a logarithmic scale with 1/2 the general MDL highlighted, which indicates isopropanol concentrations for the past 4-years are less than the MDL. Statistical analysis with the Mann-Whitney U Statistical Test (Appendix D) indicates that the trend for isopropanol is **no trend**.
- Figure 11 depicts the methanol concentrations on a logarithmic scale with 1/2 the general MDL highlighted, which indicates methanol concentrations for the past 6-years are at or less than the MDL. Statistical analysis with the Mann-Whitney U Statistical Test (Appendix D) indicates that the trend for methanol is **no trend**.
- Figure 12 depicts the 2-butanone concentrations on a logarithmic scale with 1/2 the general MDL highlighted, which indicates the past 8 sampling rounds are at or less than the MDL. Statistical analysis with the Mann-Whitney U Statistical Test (Appendix D) indicates that the trend for 2-butanone is **no trend**.
- Figure 13 depicts the toluene concentrations on a logarithmic scale with 1/2 the general MDL highlighted, which indicates that 4 of the last 5 sampling rounds are less than the MDL. Statistical analysis with the Mann-Whitney U Statistical Test (Appendix D) indicates that the trend for toluene is **no trend**.

For the SSICs there are no **increasing trends** for the statistical analysis at the 90 % confidence interval for well GM-5. There have been no VOCs detected at any other well in the last three years of groundwater monitoring. Total VOC concentrations versus time graphs for well GM-5 are shown on Figure 6 for historical trends, and on Figure 7 for post-remediation trends. Groundwater quality results do not indicate a statistically significant increase in VOCs at GM-5 since the GW/SVE system was turned-off in March 1997 (Appendix D). Additionally, Figure 8 also shows that the VOC levels have not increased with the increase (rebound) in the water table at GM-5 since the remediation system was turned-off. The historical water table increase (rebound) in the former tank basin was approximately 5-feet in the center of the cone-of-depression in 1998 - 1999. This water table increase was later followed by a general decrease in groundwater elevations in 1999 and early-2000, and a decrease in late-2001 through 2001, however, no increase in the VOC levels at GM-5 has been detected with either a rising or falling water table. Figure 14 presents a linear regression analysis of the toluene data depicting the diminishing concentrations in GM-5. This figure shows the trend of toluene detection at GM-5 is below the RAOs.

3.0 SUMMARY AND CONCLUSIONS

Based on extensive groundwater monitoring data (collected from 1987 through 2001), and the monitoring of the VOC levels in groundwater pre- and post-remediation, it does not appear that there are any VOCs remaining in groundwater to migrate from the former UST basin. This result was predicted in the groundwater flow model (Unisys, October, 1997).

The groundwater monitoring and sampling schedule, outlined in the table below, summarizes the substantial post-remediation monitoring and sampling program implemented at the site. The lack of VOCs detected in the soil and groundwater environment in and downgradient of the former UST basin substantiates the success of the remedial program.

Location	1998	1999				2000				2001			
	Monthly	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
GM-3	X	X	X	X	X	X		X		X			X	
GM-3D		X	X	X	X	X		X		X			X	
GM-5	X	X	X	X	X	X		X		X			X	
GM-8	X	X	X	X	X	X		X		X			X	
GW-10	X	X	X	X	X	X		X		X			X	
MW-13	X	X	X	X	X	X		X		X			X	
MW-13D	X	X	X	X	X	X		X		X			X	
MW-13DD		X	X	X	X	X		X		X			X	

The goal of the long-term monitoring plan selected by NYSDEC for the post-remediation groundwater sampling program was to evaluate the potential for migration of SSICs in groundwater at the site. The sampling program has revealed there are no VOCs migrating in the groundwater at the site, and the IMs implemented were successful as the final remedy for corrective action. Accordingly, no further groundwater monitoring is scheduled for the site, and Unisys is requesting NYSDEC reclassify the site from a **Class IV** to a **Class V** site. The post-remediation groundwater monitoring program has demonstrated that the remedial actions implemented, and the resulting water quality conditions existing at the site are protective of the soil and groundwater quality for the state of New York.

It is recommended that the monitoring wells be abandoned in the spring-2002 and a well abandonment report is sent to NYSDEC following the successful abandonment of the groundwater monitoring wells.

4.0 REFERENCES

BHE Environmental, Inc., 1990. *Operation Work Plan for the Interim Remedial Measures, Former Burroughs-Unisys Facility, Rochester, New York.*

- -, 1995. *Remedial Design for Former Burroughs-Unisys Facility, Rochester, New York*, March 10, 1995.

- -, 1996. *Annual Performance Report of Remedial Activities for Former Burroughs Unisys Facility, Rochester, New York,* September 27, 1996.

Dames and Moore, 1989. *Report on Monitoring Well Sampling and Analysis Former Burroughs Unisys Facility, Rochester, New York,*

Geraghty and Miller, Inc., 1987. *Investigation of Groundwater Quality Conditions at the Nu-Kote International facility (Formally Burroughs, Inc., Rochester, New York*

- -, 1988. *Investigation of Groundwater Quality Conditions at the Burroughs Office Products Division, Rochester, New York*

Integrated Environmental Solutions, Inc., 1993. *Addendum Remedial Investigation Report for Former Burroughs Unisys Facility, Rochester, New York,*

- -, 1993. *Draft Feasibility Study Burroughs Unisys Facility*, August 6, 1993.

Supercomputer Systems Engineering and Services Company (SSESCO), 1997. The savi3D User Guide.

Terra Vac Corporation, 1993. *Pilot Test Report, Former Burroughs Unisys Facility, Rochester, New York.* November 1989

Unisys Corporation, 2001. *2001 Annual Monitoring Report, Former Burroughs-Unisys Facility, Rochester, New York.* April 13, 2001.

- -, 2000. *1999 Annual Monitoring Report, Former Burroughs-Unisys Facility, Rochester, New York.* April 21, 2000.

- -, 1999. *1998 Annual Monitoring Report, Former Burroughs-Unisys Facility, Rochester, New York.* April 30, 1999.

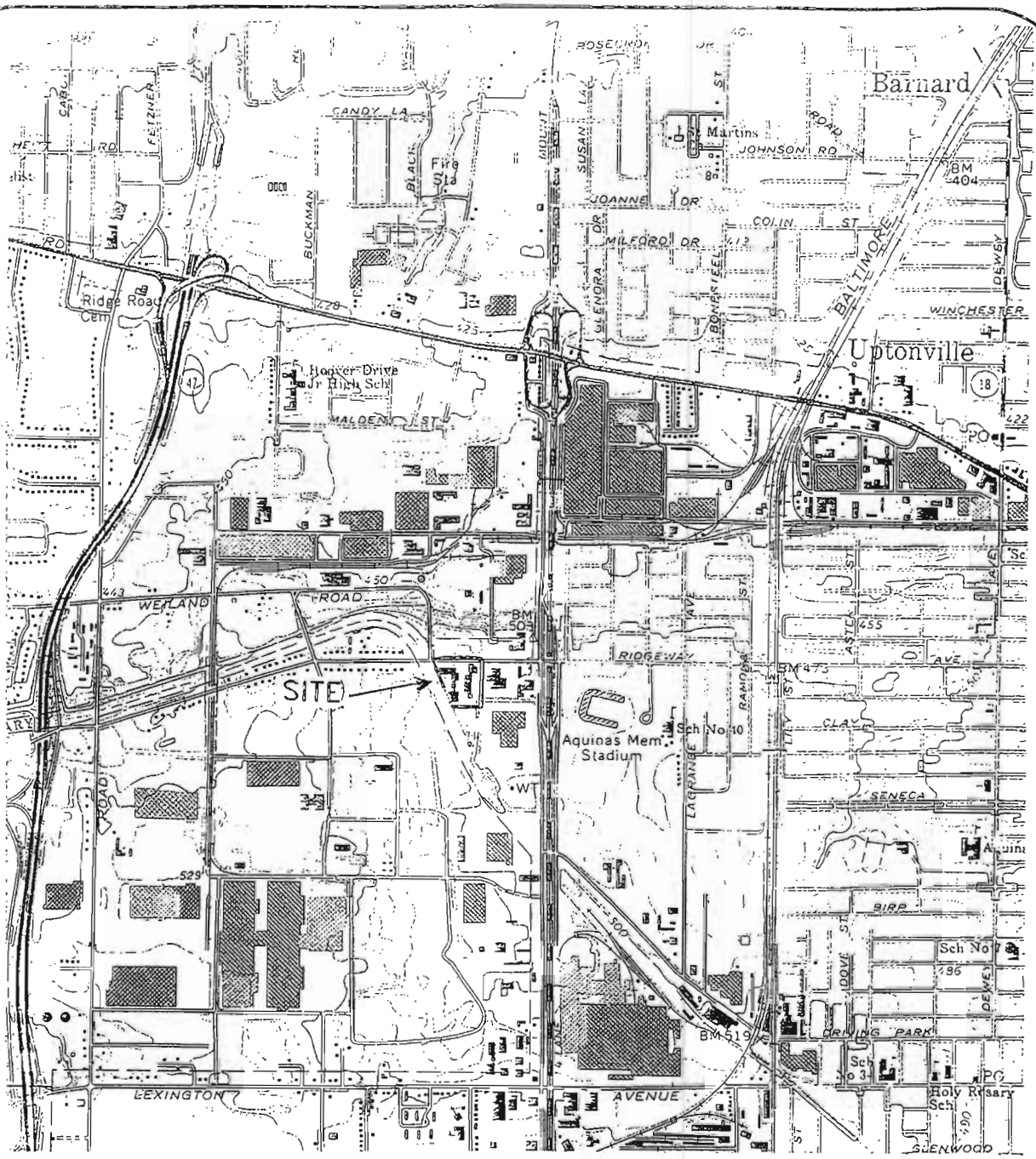
- -, 1998. *Post-Remediation Groundwater Monitoring Plan, Former Burroughs-Unisys Facility, Rochester, New York.* September 24, 1998.

- -, 1998. *Post-Remediation Groundwater Monitoring Plan, Former Burroughs-Unisys Facility, Rochester, New York.* October 28, 1998.

- -, 1997. *Focused Evaluation of Remedial Alternatives, Former Burroughs-Unisys Facility, Rochester, New York.* October 15, 1997.

- -, 1995. *Citizen Participation Plan for Site Remediation Activities at Site #8-28-075, Former Burroughs-Unisys Facility, Rochester, New York.* March, 1995.

- -, 1992. *Draft Remedial Investigation Report for Former Burroughs Unisys Facility, Rochester, New York.*



ROCHESTER WEST QUADRANGLE
NEW YORK–MONROE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

PROTECTED MATERIAL
3RCH/00696

QUADRANGLE LOCATION

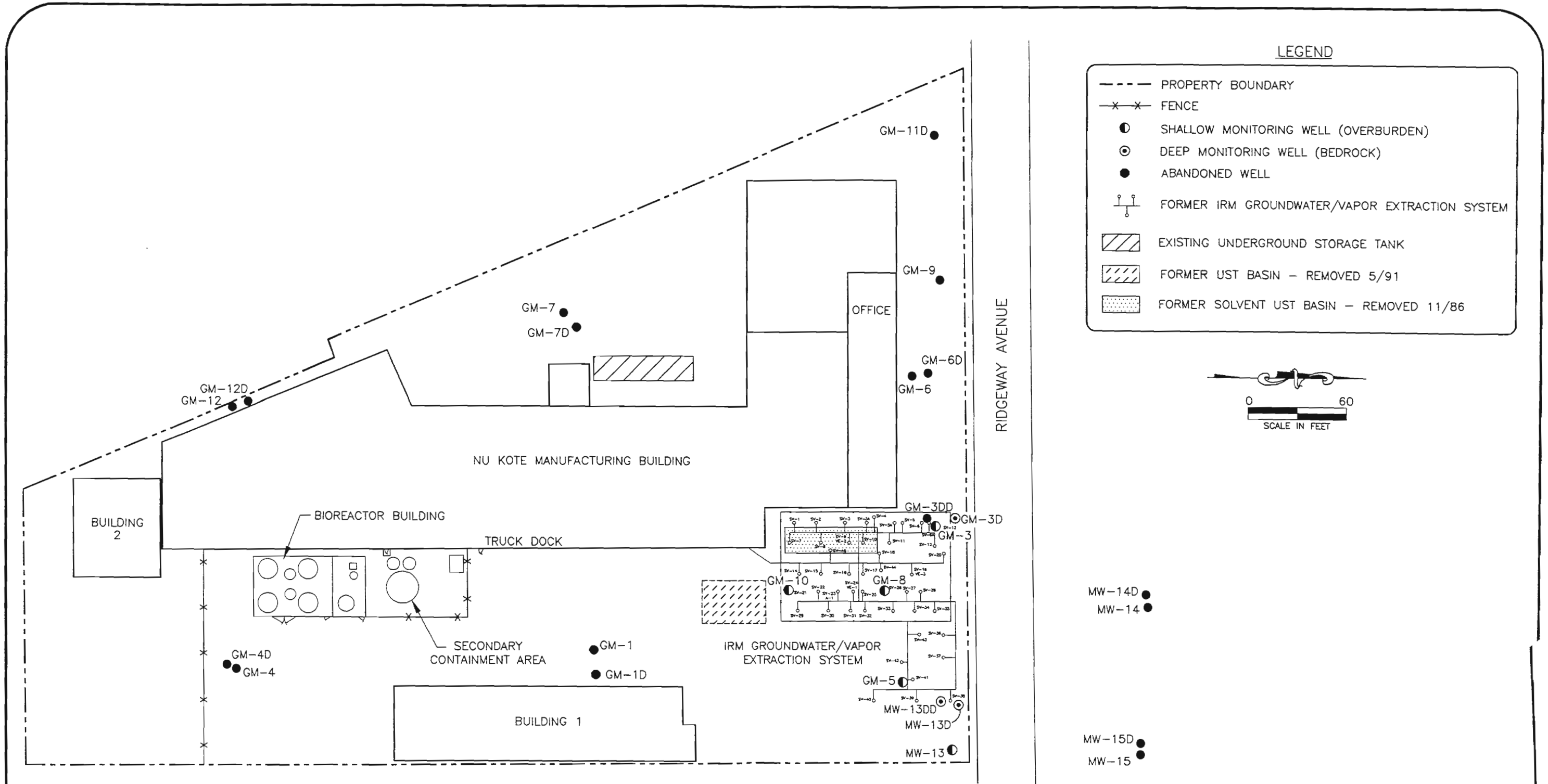
PJ CADD
COMPUTER-AIDED DRAFTING & DESIGN
(612) 487-5358

UNISYS

FILE NAME: TOPO
DATE: 11/7/94

FIGURE 1
SITE LOCATION MAP

BURROUGHS – UNISYS FACILITY
ROCHESTER, NEW YORK



pointmap incorporated

UNISYS

FIGURE 2
SITE MAP AND FORMER REMEDIATION SYSTEM LAYOUT

2001 ANNUAL MONITORING REPORT
FORMER BURROUGHS FACILITY
ROCHESTER, NEW YORK

FILE NAME: ROC-SM-JAN02 DATE: 1/8/02	PREPARED BY: KBR/LS	REVIEWED BY:	DATE:

Figure 6 - Well GM-5 Total VOC Concentrations

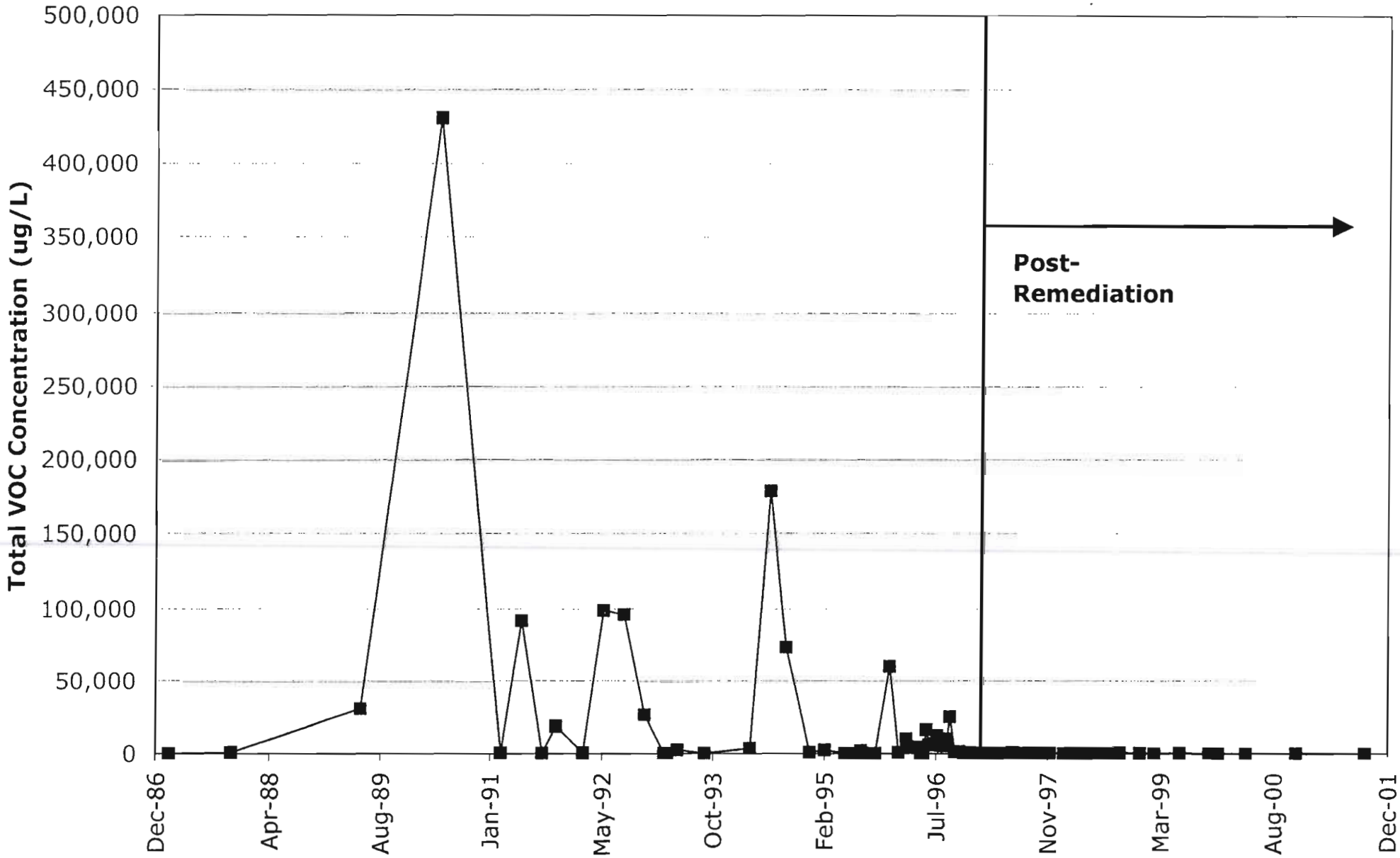


Figure 7 - Well GM-5 Total VOC Concentrations

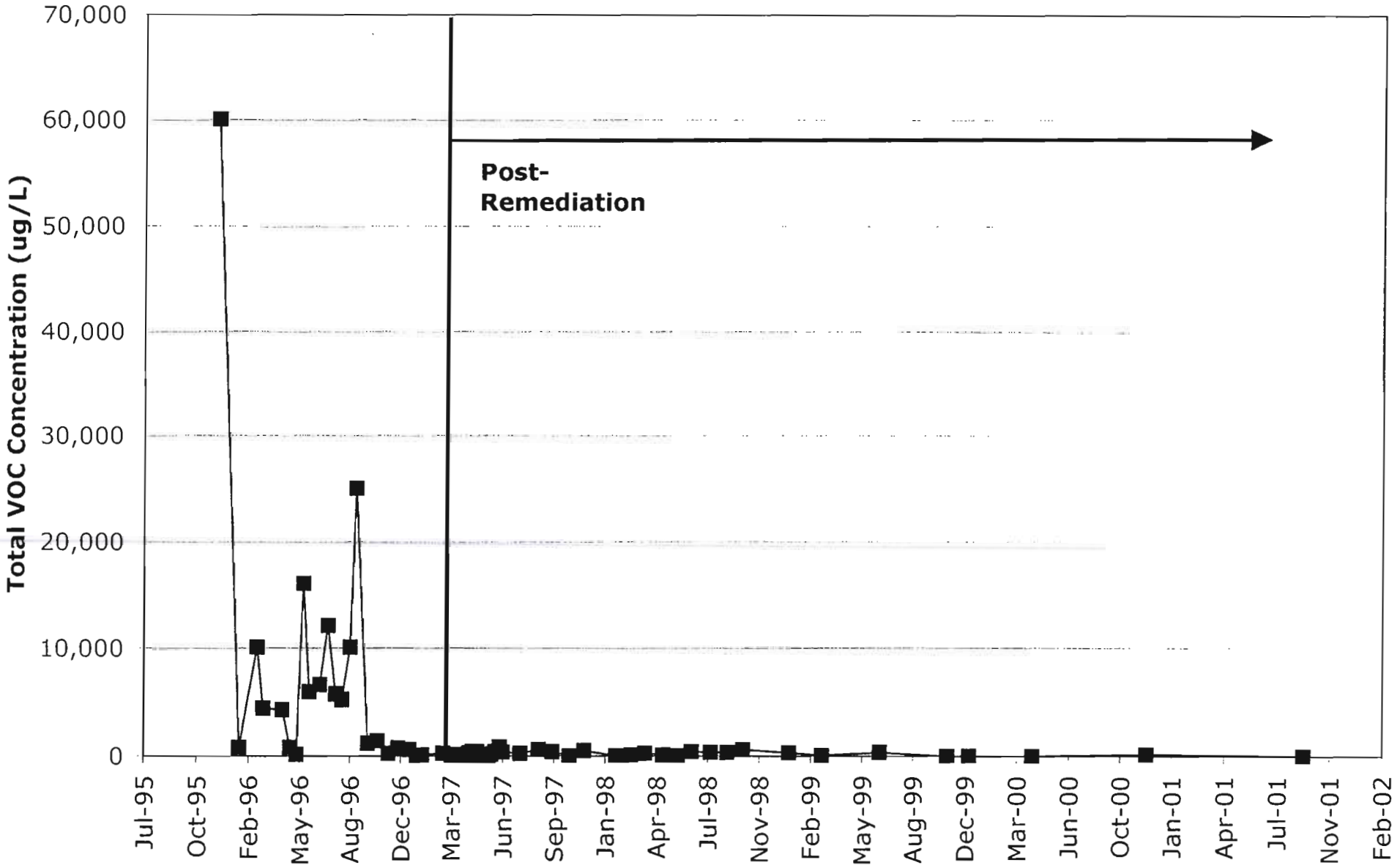


Figure 8 - GM-5 Total VOCs vs. Groundwater Elevation

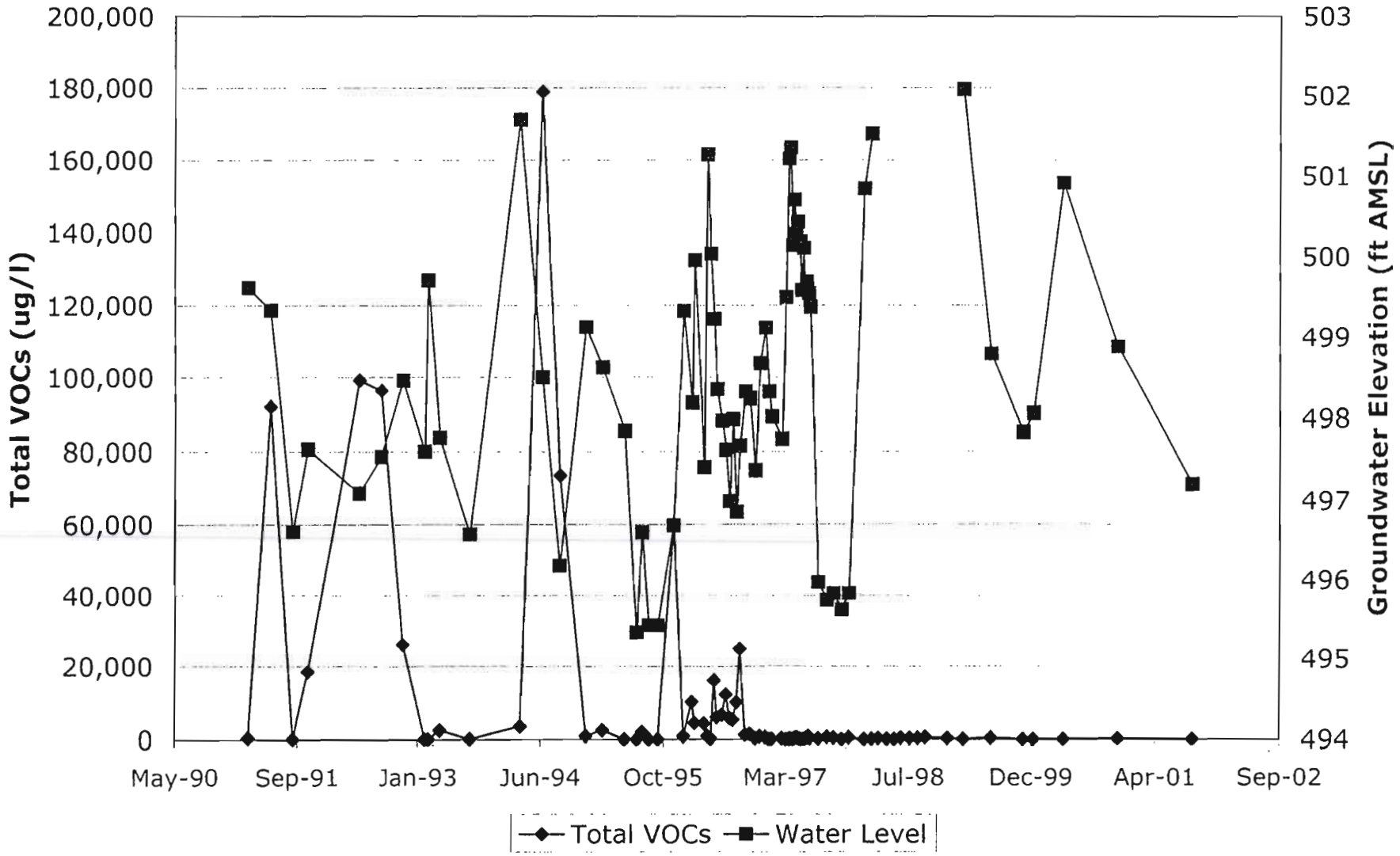
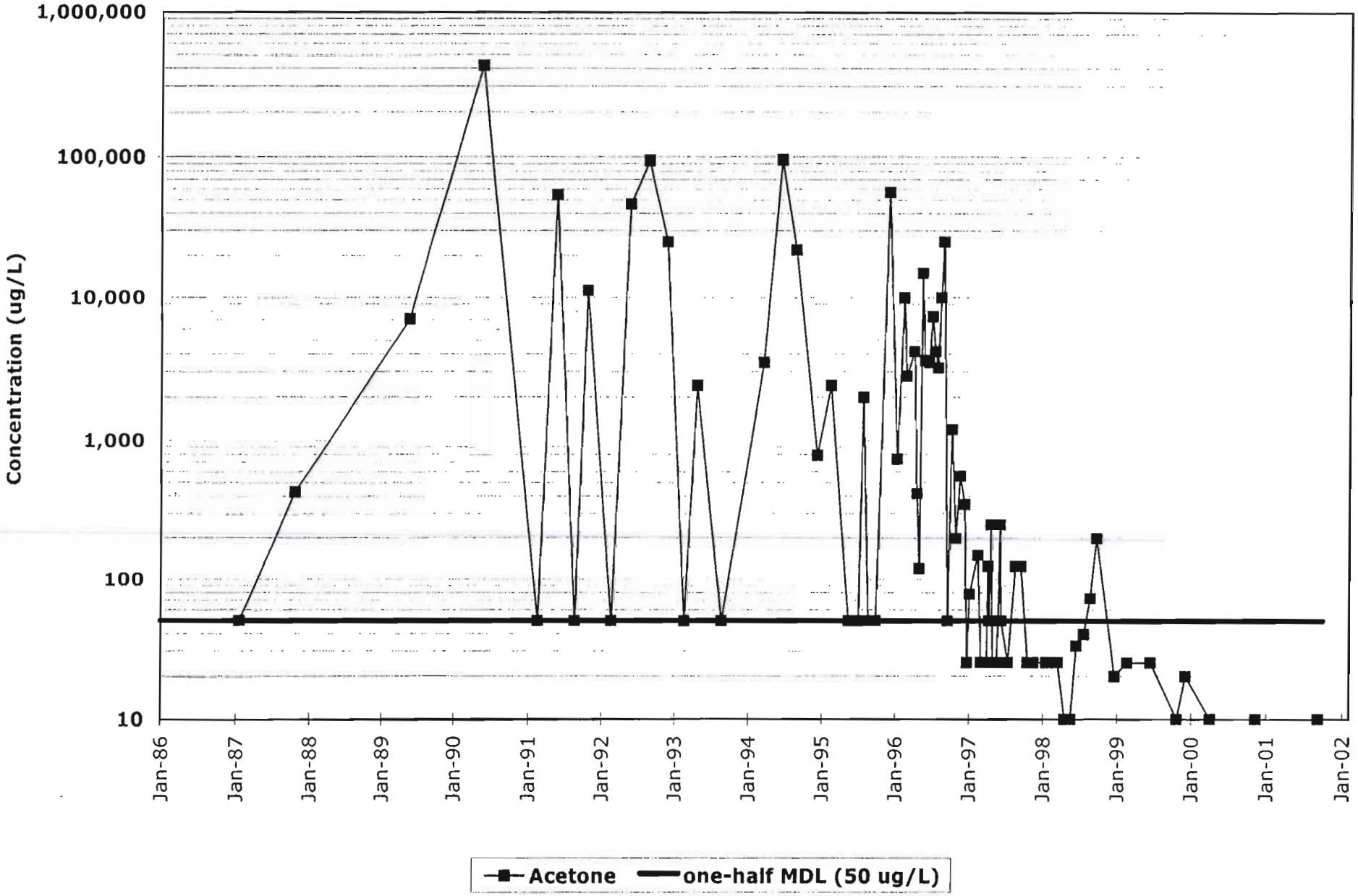
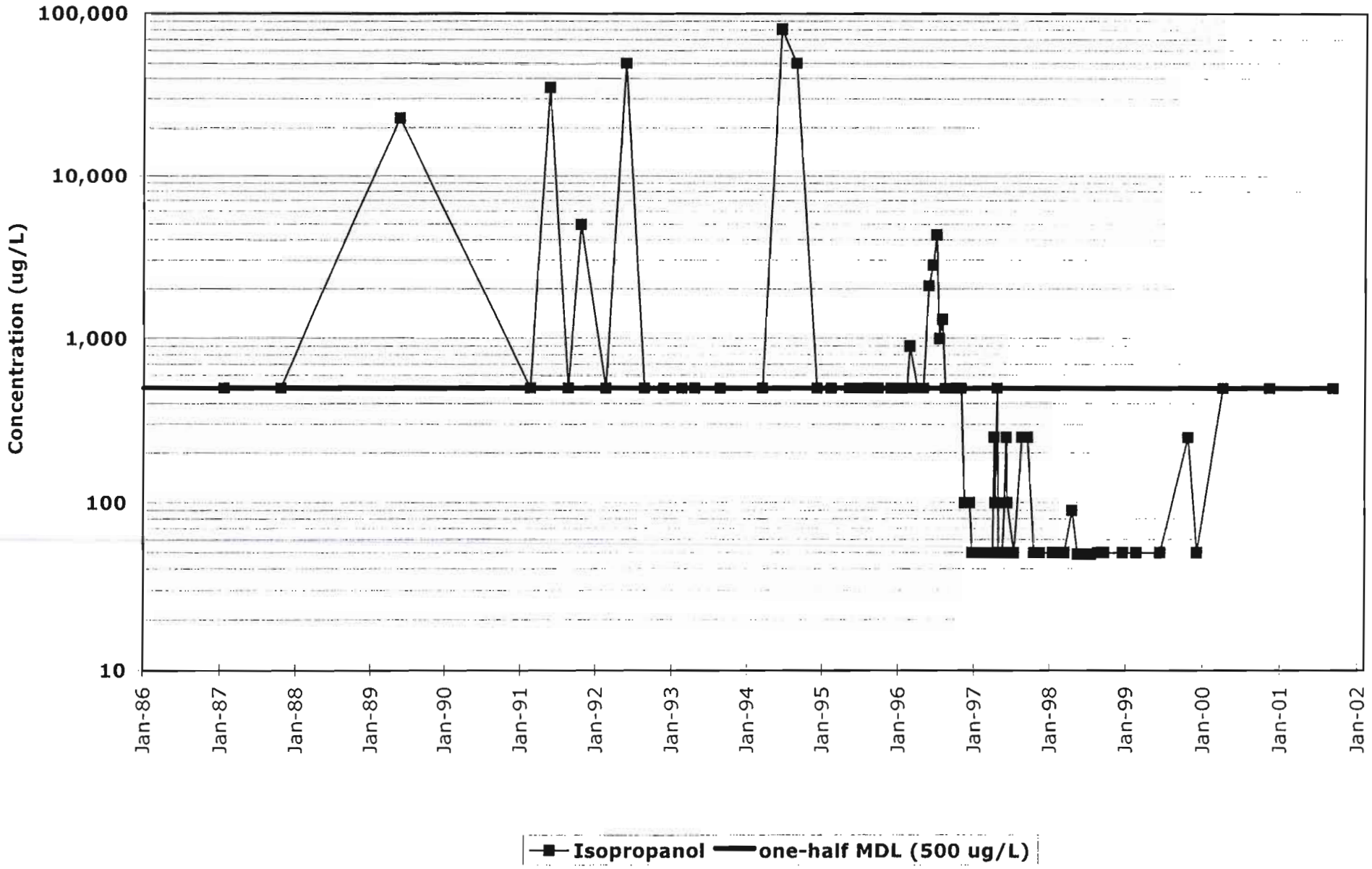


Figure 9 - Acetone Concentrations - GM-5



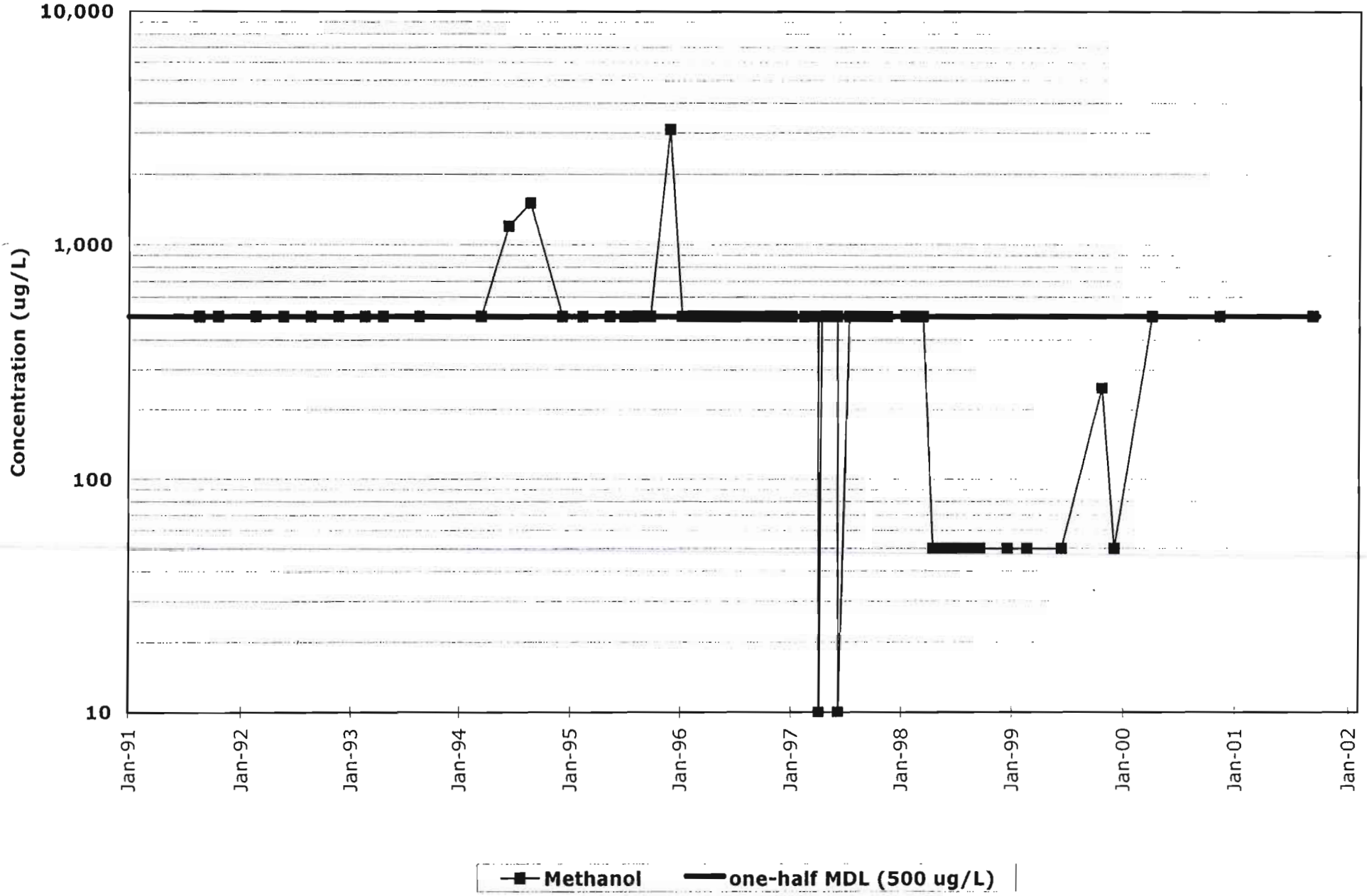
Data points shown at or below baseline of 10 - 50 ug/L were non-detect at or

Figure 10 - Isopropanol Concentrations - GM-5



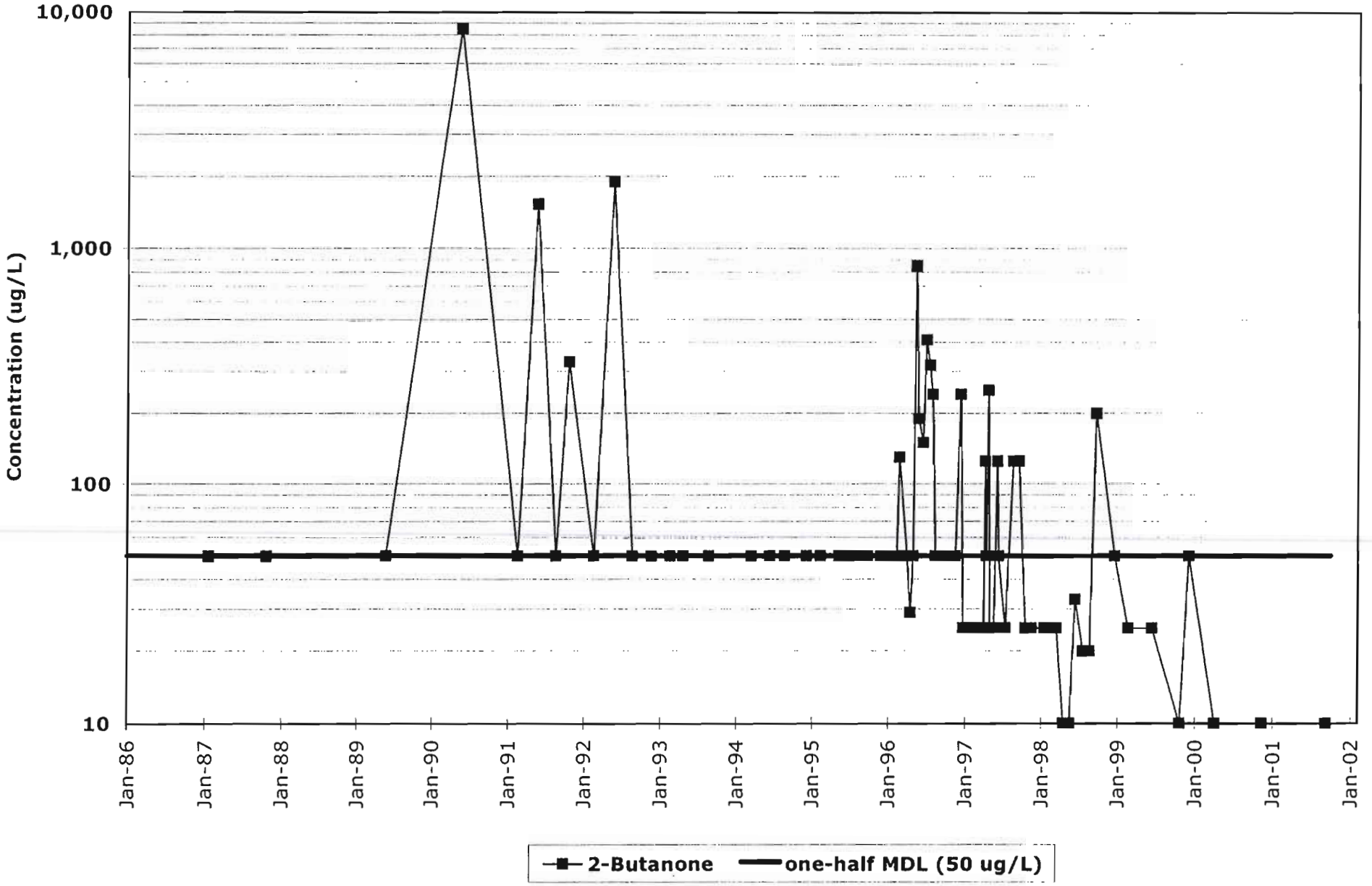
Data points shown at baseline of 50 - 500 ug/L were non-detect at or above

Figure 11 - Methanol Concentrations - GM-5



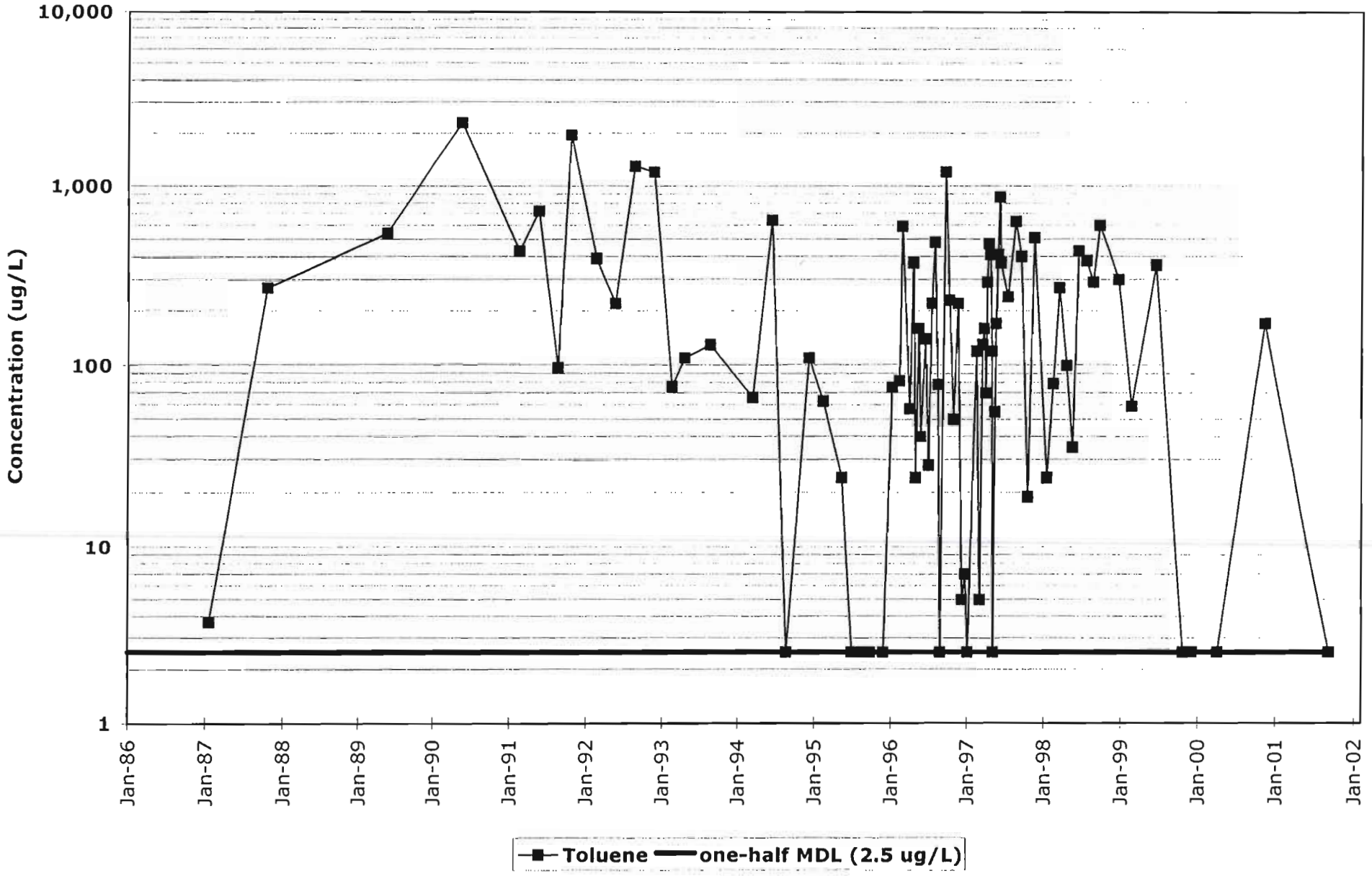
Data points shown at baseline of 10 - 500 ug/L wer ·on-detect at or above

Figure 12 - 2-Butanone Concentrations - GM-5



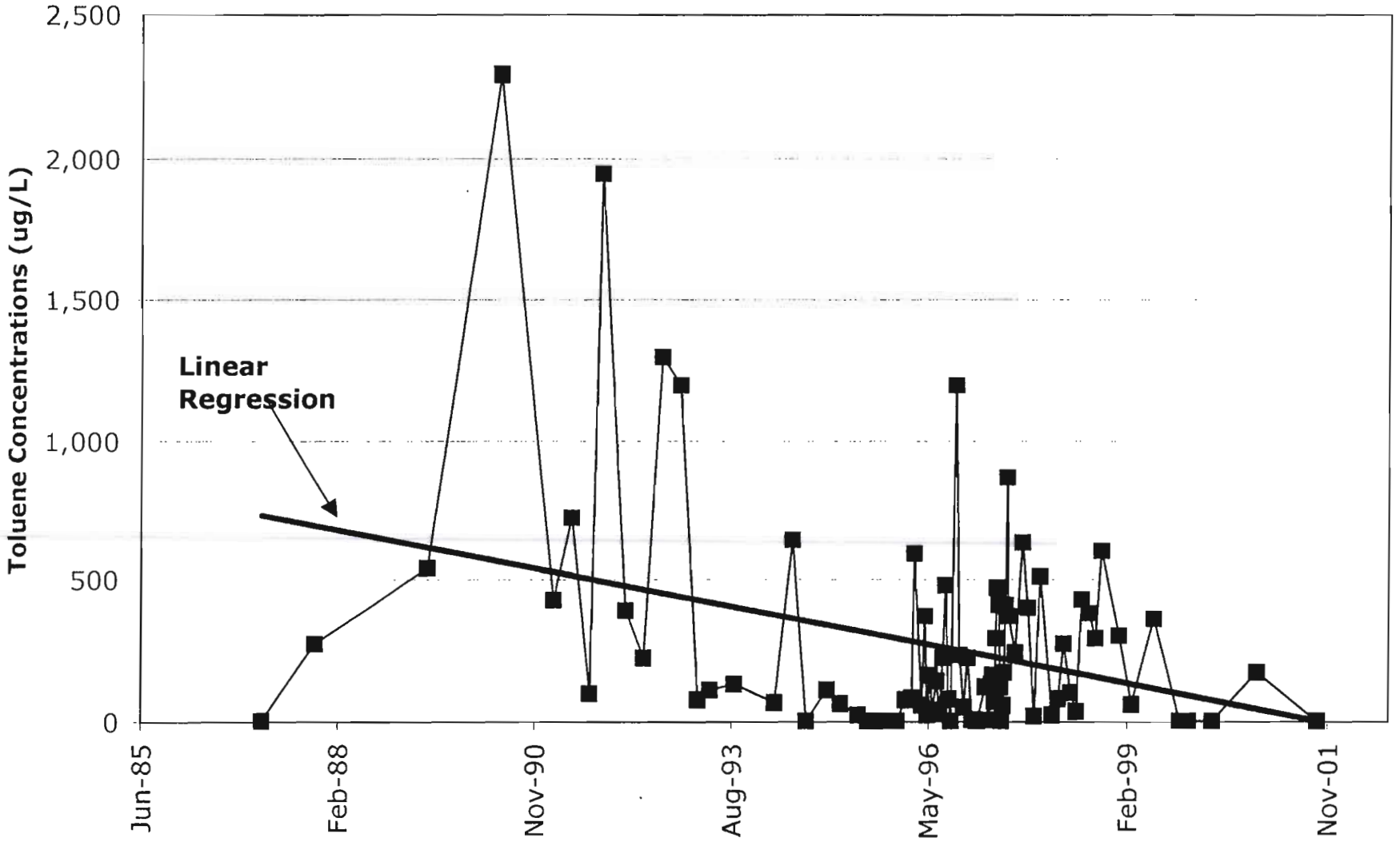
Data points shown at baseline of 5 - 50 ug/L were n[illegible]-detect at or above

Figure 13 - Toluene Concentrations - GM-5



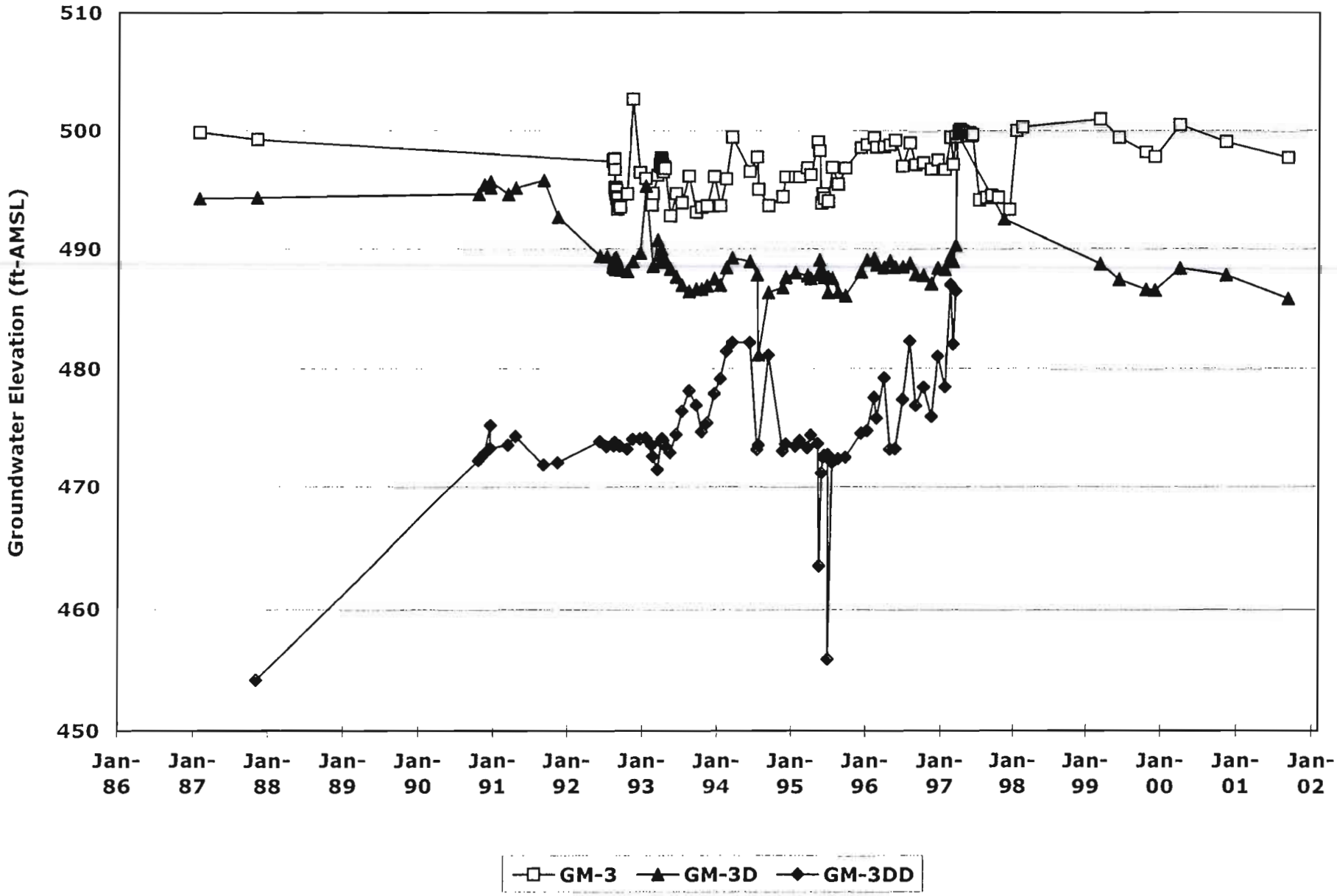
Data points shown at baseline of 2.5 ug/L were no' 'etect at or above the Method Detection Limit (MDL)

Figure 14 - GM-5 Linear Regression Analysis

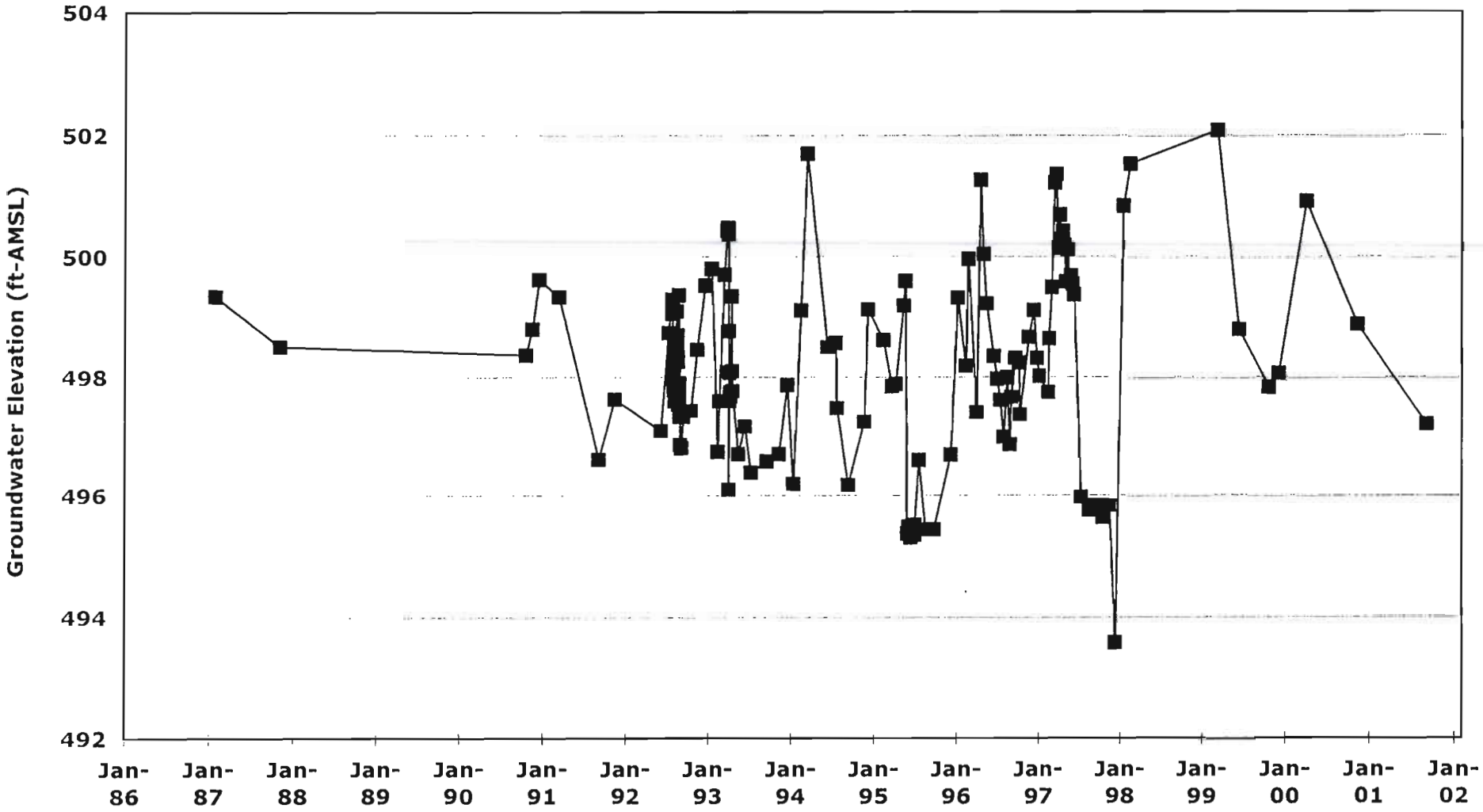


Appendix B

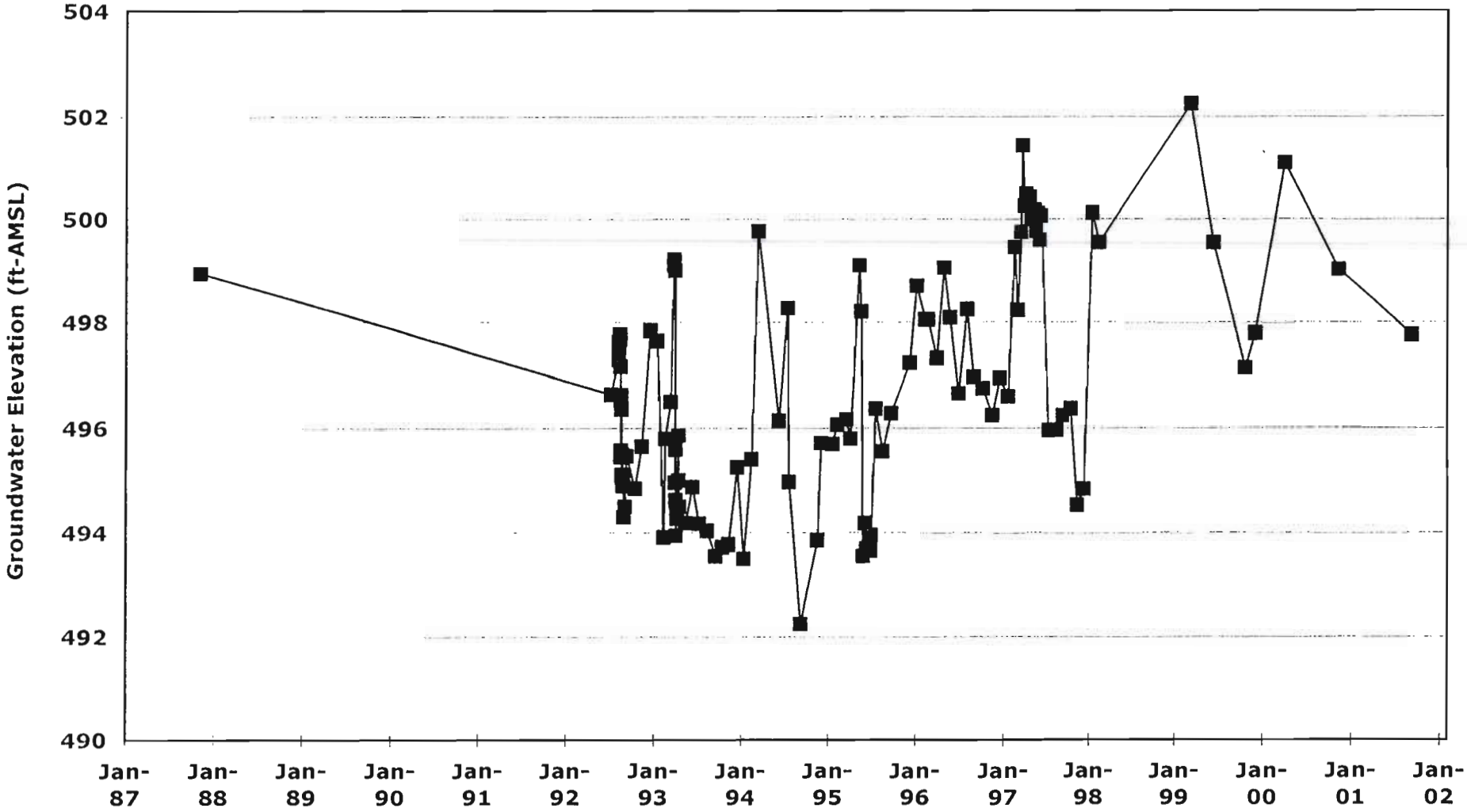
Groundwater Hydrograph - Well Nest GM-3
Former Burroughs Facility - 1225 Ridgeway
Rochester, New York



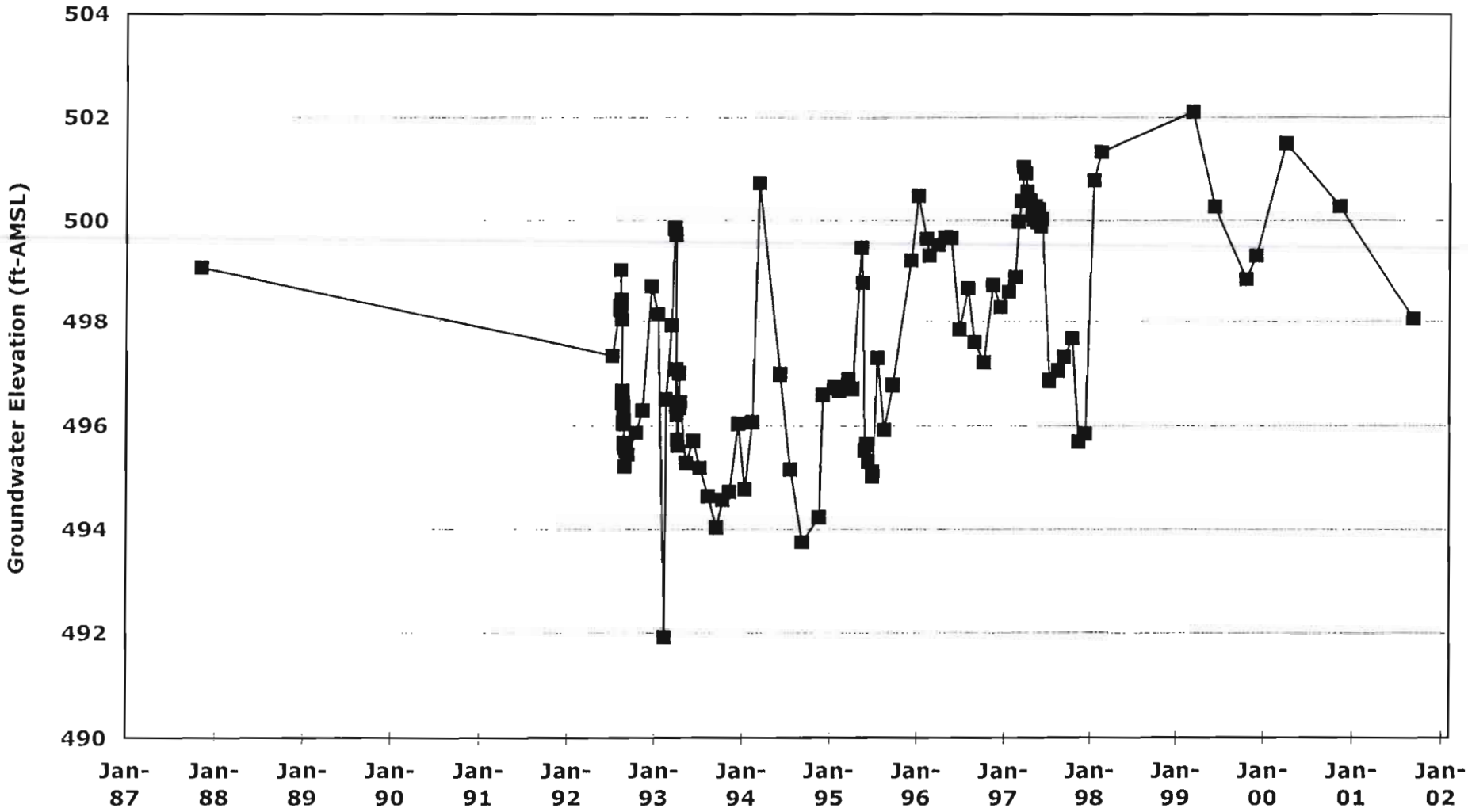
Groundwater Hydrograph
Former Burroughs Facility - 1225 Ridgeway
Well GM-5
Rochester, New York



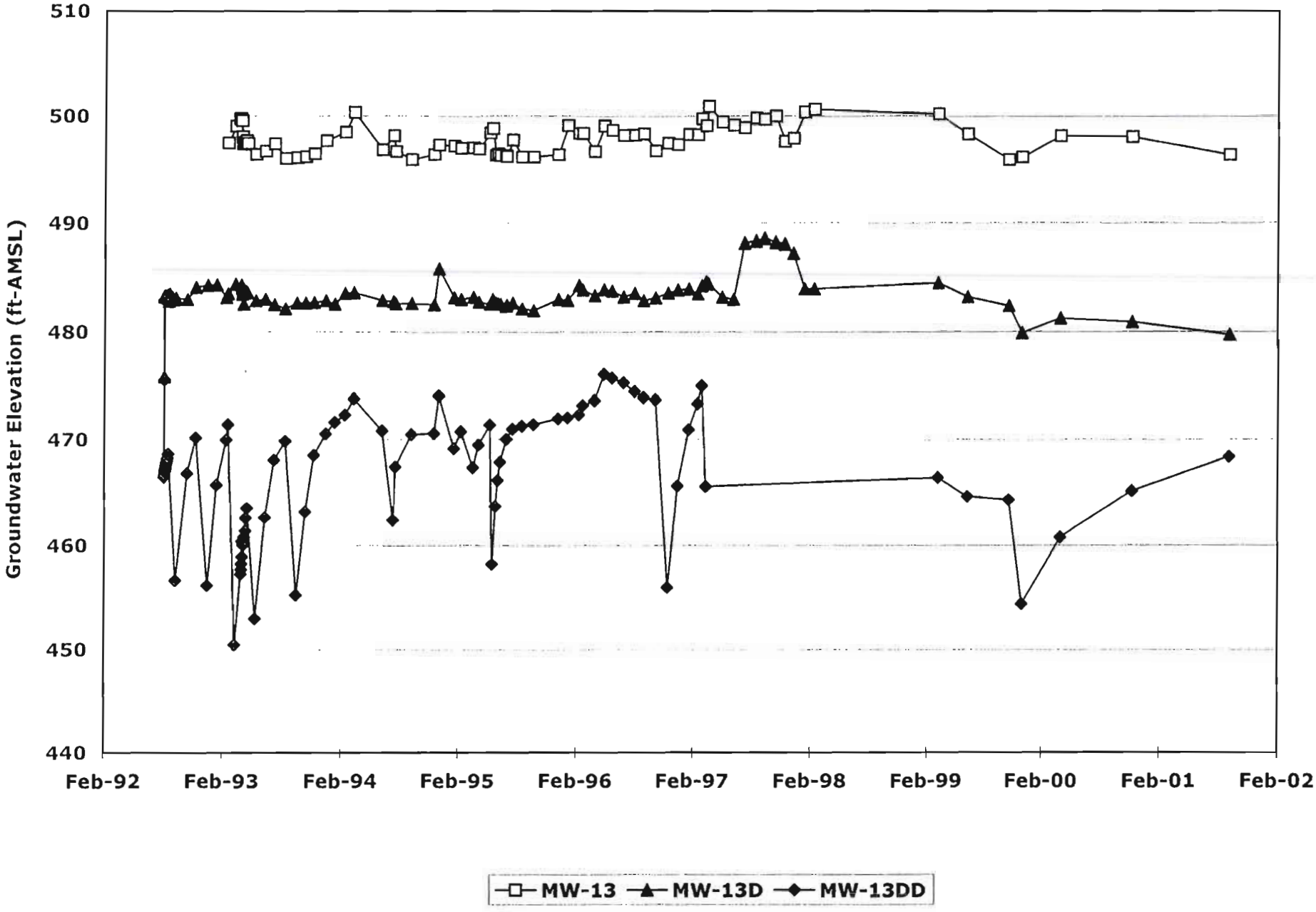
Groundwater Hydrograph
Former Burrough Facility - 1225 Ridgeway
Well GM-8
Rochester, New York



Groundwater Hydrograph
Former Burroughs Facility - 1225 Ridgeway
Well GM-10
Rochester, New York



Groundwater Hydrograph - Well 13 Nest
Former Burroughs Facility - 1225 Ridgeway
Rochester, New York



Appendix C

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-10	11/01/1987	GM-10	6000000	5400000	NT	2200000	<5	13600000.00
GM-10	06/01/1989	GM-10	1530000	991000	NT	507000	31000	3059000.00
GM-10	06/01/1990	GM-10	640000	NT	NT	120000	5600	765600.00
GM-10	03/01/1991	GM-10	1760	1320	NT	<100	125	3205.00
GM-10	06/01/1991	GM-10	3810	1130	NT	1610	<5.0	6550.00
GM-10	09/01/1991	GM-10	<100	<1000	<1	<100	17	17.00
GM-10	11/01/1991	GM-10	<100	<1000	<1	<100	4.99	4.99
GM-10	03/01/1992	GM-10	<100	<1000	<1	<100	<5.0	0.00
GM-10	06/01/1992	GM-10	<100	<1000	<1	<100	<5.0	0.00
GM-10	09/01/1992	GM-10	<100	<1000	<1	<100	<5.0	0.00
GM-10	12/02/1992	GM-10	170	<1000	<1	<100	<5.0	170.00
GM-10	03/01/1993	GM-10	<100	<1000	<1	<100	<5.0	0.00
GM-10	03/16/1993	GM-10	<100	<1000	<1	<100	<5	0.00
GM-10	05/01/1993	GM-10	<100	<1000	<1	<100	<5.0	0.00
GM-10	09/01/1993	GM-10	<100	<1000	<1	<100	<5.0	0.00
GM-10	03/25/1994	GM-10	<100	<1000	<1	<100	<5.0	0.00
GM-10	06/21/1994	GM-10	<100	<1000	<1	<100	<5.0	0.00
GM-10	09/01/1994	GM-10	<100	<1000	<1	<100	<5.0	0.00
GM-10	12/16/1994	GM-10	<100	<1000	<1	<100	<5	0.00
GM-10	02/22/1995	GM-10	<100	<1000	<1	<100	<5	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-10	05/24/1995	GM-10	<100	<1000	<1	<100	<5	0.00
GM-10	07/11/1995	GM-10	<100	<1000	<1	<100	<5	0.00
GM-10	10/05/1995	GM-10	<100	<1000	<1	<100	<5	0.00
GM-10	01/18/1996	GM-10	<100	<1000	<1	<100	<5	0.00
GM-10	04/11/1996	GM-10	<10	<100	<5.0	<10	<5	0.00
GM-10	07/10/1996	GM-10	<10	<100	<5.0	<10	<5	0.00
GM-10	11/07/1996	GM-10	<100	<1000	<1	<100	<5	0.00
GM-10	03/13/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	04/01/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	04/10/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	04/16/1997	GM-10	<50	<100	<0.001	<50	<5	0.00
GM-10	04/22/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	04/30/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	05/09/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	05/15/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	05/23/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	05/28/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	06/05/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	06/13/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	06/19/1997	GM-10	<50	<100	<0.001	<50	<5	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-10	07/23/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	08/28/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	09/24/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	10/27/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	11/25/1997	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	01/26/1998	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	02/25/1998	GM-10	130	<100	<1	<50	<5	130.00
GM-10	03/24/1998	GM-10	<50	<100	<1	<50	<5	0.00
GM-10	04/28/1998	GM-10	NT	<180	<0.11	NT	NT	0.00
GM-10	04/28/1998	GM-10	<20	NT	NT	<20	<5.0	0.00
GM-10	05/27/1998	GM-10	NT	<98	<0.11	NT	NT	0.00
GM-10	05/27/1998	GM-10	<20	NT	NT	<20	<5.0	0.00
GM-10	06/23/1998	GM-10	<20	NT	NT	<20	<5	0.00
GM-10	06/23/1998	GM-10	NT	<98	<0.11	NT	NT	0.00
GM-10	07/30/1998	GM-10	NT	<98	<0.11	NT	NT	0.00
GM-10	07/30/1998	GM-10	<20	NT	NT	<20	<5	0.00
GM-10	08/31/1998	GM-10	NT	<100	<0.1	NT	NT	0.00
GM-10	08/31/1998	GM-10	<20	NT	NT	<20	<5	0.00
GM-10	09/30/1998	GM-10	NT	<100	<0.1	NT	NT	0.00
GM-10	09/30/1998	GM-10	<20	NT	NT	<20	<5	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-10	03/22/1999	GM-10	<20	NT	NT	<20	<5.0	0.00
GM-10	03/22/1999	GM-10	NT	<100	<0.1	NT	NT	0.00
GM-10	06/24/1999	GM-10	<20	NT	NT	<20	<5.0	0.00
GM-10	06/24/1999	GM-10	NT	<100	<0.1	NT	NT	0.00
GM-10	11/02/1999	GM-10	<20	NT	NT	<20	<5.0	0.00
GM-10	11/02/1999	GM-10	NT	<500	<0.5	NT	NT	0.00
GM-10	12/14/1999	GM-10	<20	NT	NT	<20	<5.0	0.00
GM-10	12/14/1999	GM-10	NT	<1000	<1	NT	NT	0.00
GM-10	12/14/1999	GM-10	NT	<1000	<1	NT	NT	0.00
GM-10	04/14/2000	GM-10	<20	NT	NT	<20	<5.0	0.00
GM-10	04/14/2000	GM-10	NT	<1000	<1	NT	NT	0.00
GM-10	11/21/2000	GM 10	<20	<1000	<1	<20	<5.0	0.00
GM-10	09/19/2001	GM 10	<20	<1000	<1	<20	<5.0	0.00
GM-3	02/01/1987	GM-3	1700000	20000000	NT	15000	4200	21719200.00
GM-3	11/01/1987	GM-3	4500000	6800	NT	<100	<5.0	4506800.00
GM-3	06/01/1989	GM-3	1520000	2125000	NT	<100	<5.0	3645000.00
GM-3	06/01/1990	GM-3	1000000	1000000	NT	NT	<5.0	2000000.00
GM-3	03/01/1991	GM-3	19800	13400	NT	<100	209	33409.00
GM-3	06/01/1991	GM-3	33400	36600	NT	<100	<5.0	70000.00
GM-3	09/01/1991	GM-3	14200	9260	<1	<100	<5.0	23460.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-3	11/01/1991	GM-3	<100	<1000	<1	<100	15	15.00
GM-3	03/01/1992	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	06/01/1992	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	09/01/1992	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	12/02/1992	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	03/01/1993	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	03/16/1993	GM-3	<100	<1000	<1	<100	<5	0.00
GM-3	05/01/1993	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	09/01/1993	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	03/25/1994	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	06/21/1994	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	09/01/1994	GM-3	<100	<1000	<1	<100	<5.0	0.00
GM-3	12/16/1994	GM-3	<100	<1000	<1	<100	<5	0.00
GM-3	02/23/1995	GM-3	<100	<1000	<1	<100	<5	0.00
GM-3	05/23/1995	GM-3	<100	<1000	<1	<100	<5	0.00
GM-3	07/11/1995	GM-3	<100	<1000	<1	<100	<5	0.00
GM-3	10/05/1995	GM-3	<100	<1000	<1	<100	<5	0.00
GM-3	01/18/1996	GM-3	<100	<1000	<1	<100	<5	0.00
GM-3	04/11/1996	GM-3	<10	<100	<5.0	<10	<5	0.00
GM-3	07/10/1996	GM-3	<10	<100	<5.0	<10	<5	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-3	11/07/1996	GM-3	<100	<1000	<1	<100	<5	0.00
GM-3	04/01/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	04/10/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	04/16/1997	GM-3	<50	<100	<0.001	<50	<5	0.00
GM-3	04/22/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	04/30/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	05/09/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	05/15/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	05/23/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	05/28/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	06/05/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	06/13/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	06/19/1997	GM-3	<50	<100	<0.001	<50	<5	0.00
GM-3	07/23/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	08/28/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	09/24/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	10/27/1997	GM-3	<50	<100	<1	<50	NT	0.00
GM-3	11/25/1997	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	01/26/1998	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	02/25/1998	GM-3	<50	<100	<1	<50	<5	0.00

Unisys
Corporate Environmental Affairs

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-3	03/24/1998	GM-3	<50	<100	<1	<50	<5	0.00
GM-3	04/28/1998	GM-3	<20	NT	NT	<20	<5.0	0.00
GM-3	04/28/1998	GM-3	NT	<180	<0.11	NT	NT	0.00
GM-3	05/27/1998	GM-3	NT	<98	<0.11	NT	NT	0.00
GM-3	05/27/1998	GM-3	<20	NT	NT	<20	<5.0	0.00
GM-3	06/23/1998	GM-3	NT	<98	<0.11	NT	NT	0.00
GM-3	06/23/1998	GM-3	<20	NT	NT	<20	<5	0.00
GM-3	07/30/1998	GM-3	<20	NT	NT	<20	<5	0.00
GM-3	07/30/1998	GM-3	NT	<98	<0.11	NT	NT	0.00
GM-3	08/31/1998	GM-3	NT	<100	<0.1	NT	NT	0.00
GM-3	08/31/1998	GM-3	<20	NT	NT	<20	<5	0.00
GM-3	09/30/1998	GM-3	NT	<100	<0.1	NT	NT	0.00
GM-3	09/30/1998	GM-3	<20	NT	NT	<20	<5	0.00
GM-3	12/29/1998	GM-3	NT	<100	<0.1	NT	NT	0.00
GM-3	12/29/1998	GM-3	<20	NT	NT	<20	<5.0	0.00
GM-3	03/22/1999	GM-3	<20	NT	NT	<20	<5.0	0.00
GM-3	03/22/1999	GM-3	NT	<100	<0.1	NT	NT	0.00
GM-3	06/24/1999	GM-3	<20	NT	NT	<20	<5.0	0.00
GM-3	06/24/1999	GM-3	NT	<100	<0.1	NT	NT	0.00
GM-3	11/02/1999	GM-3	<20	NT	NT	<20	<5.0	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-3	11/02/1999	GM-3	NT	<500	<0.5	NT	NT	0.00
GM-3	12/14/1999	GM-3	<20	NT	NT	<20	<5.0	0.00
GM-3	12/14/1999	GM-3	NT	<1000	<1	NT	NT	0.00
GM-3	12/14/1999	GM-3	NT	<1000	<1	NT	NT	0.00
GM-3	04/14/2000	GM-3	<20	NT	NT	<20	<5.0	0.00
GM-3	04/14/2000	GM-3	NT	<1000	<1	NT	NT	0.00
GM-3	11/21/2000	GM 3	<20	<1000	<1	<20	<5.0	0.00
GM-3	09/19/2001	GM 3	<20	<1000	<1	<20	<5.0	0.00
GM-3D	02/01/1987	GM-3D	590	<1000	NT	<100	<5.0	590.00
GM-3D	11/01/1987	GM-3D	<100	<1000	NT	<100	<5.0	0.00
GM-3D	06/01/1989	GM-3D	270	140	NT	<100	<5.0	410.00
GM-3D	06/01/1990	GM-3D	8	<1000	NT	<100	1	9.00
GM-3D	03/01/1991	GM-3D	407.5	<1000	NT	<100	<5.0	407.50
GM-3D	06/01/1991	GM-3D	<100	<1000	NT	<100	<5.0	0.00
GM-3D	09/01/1991	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	03/01/1992	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	06/01/1992	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	09/01/1992	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	12/02/1992	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	03/01/1993	GM-3D	<100	<1000	<1	<100	<5.0	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-3D	03/19/1993	GM-3D	<100	<1000	<1	<100	<5	0.00
GM-3D	05/01/1993	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	09/01/1993	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	03/25/1994	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	06/21/1994	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	09/01/1994	GM-3D	<100	<1000	<1	<100	<5.0	0.00
GM-3D	12/16/1994	GM-3D	450	<1000	<1	<100	<5	450.00
GM-3D	05/23/1995	GM-3D	<100	<1000	<1	<100	<5	0.00
GM-3D	07/11/1995	GM-3D	<100	<1000	<1	<100	<5	0.00
GM-3D	10/05/1995	GM-3D	<100	<1000	<1	<100	<5	0.00
GM-3D	01/18/1996	GM-3D	<100	<1000	<1	<100	<5	0.00
GM-3D	04/11/1996	GM-3D	<10	<100	<5.0	<10	<5	0.00
GM-3D	07/10/1996	GM-3D	<10	<100	<5.0	<10	<5	0.00
GM-3D	11/06/1996	GM-3D	<100	<1000	<1	<100	<5	0.00
GM-3D	03/13/1997	GM-3D	<50	<100	<1	<50	<5	0.00
GM-3D	09/30/1998	GM-3D	NT	<100	<0.1	NT	NT	0.00
GM-3D	09/30/1998	GM-3D	<20	NT	NT	<20	<5	0.00
GM-3D	12/29/1998	GM-3D	<20	NT	NT	<20	<5.0	0.00
GM-3D	12/29/1998	GM-3D	NT	<100	<0.1	NT	NT	0.00
GM-3D	03/22/1999	GM-3D	<20	NT	NT	<20	<5.0	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-3D	03/22/1999	GM-3D	NT	<100	<0.1	NT	NT	0.00
GM-3D	06/24/1999	GM-3D	<20	NT	NT	<20	<5.0	0.00
GM-3D	06/24/1999	GM-3D	NT	<100	<0.1	NT	NT	0.00
GM-3D	11/02/1999	GM-3D	<20	NT	NT	<20	<5.0	0.00
GM-3D	11/02/1999	GM-3D	NT	<500	<0.5	NT	NT	0.00
GM-3D	12/14/1999	GM-3D	<20	NT	NT	<20	<5.0	0.00
GM-3D	12/14/1999	GM-3D	NT	<1000	<1	NT	NT	0.00
GM-3D	12/14/1999	GM-3D	NT	<1000	<1	NT	NT	0.00
GM-3D	04/14/2000	GM-3D	<20	NT	NT	<20	<5.0	0.00
GM-3D	04/14/2000	GM-3D	NT	<1000	<1	NT	NT	0.00
GM-3D	11/21/2000	GM 3D	<20	<1000	<1	<20	<5.0	0.00
GM-3D	09/19/2001	GM 3D	<20	<1000	<1	<20	<5.0	0.00
GM-5	02/01/1987	GM-5	<100	<1000	NT	<100	3.7	3.70
GM-5	11/01/1987	GM-5	430	<1000	NT	<100	270	700.00
GM-5	06/01/1989	GM-5	7100	23000	NT	<100	540	30640.00
GM-5	06/01/1990	GM-5	420000	NT	NT	8500	2300	430800.00
GM-5	03/01/1991	GM-5	<100	<1000	NT	<100	428	428.00
GM-5	06/01/1991	GM-5	54600	35200	NT	1540	721	92061.00
GM-5	09/01/1991	GM-5	<100	<1000	<1	<100	97	97.00
GM-5	11/01/1991	GM-5	11300	4970	<1	330	1950	18550.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-5	03/01/1992	GM-5	<100	<1000	<1	<100	390	390.00
GM-5	06/01/1992	GM-5	47000	50000	<1	1900	220	99120.00
GM-5	09/01/1992	GM-5	95000	<1000	<1	<100	1300	96300.00
GM-5	12/02/1992	GM-5	25000	<1000	<1	<100	1200	26200.00
GM-5	03/01/1993	GM-5	<100	<1000	<1	<100	76	76.00
GM-5	03/16/1993	GM-5	<100	<1000	<1	<100	76	76.00
GM-5	05/01/1993	GM-5	2400	<1000	<1	<100	110	2510.00
GM-5	09/01/1993	GM-5	<100	<1000	<1	<100	130	130.00
GM-5	03/25/1994	GM-5	3500	<1000	<1	<100	66	3566.00
GM-5	06/22/1994	GM-5	96000	81000	1.2	<100	640	178840.00
GM-5	09/01/1994	GM-5	22000	50000	1.5	<100	<5.0	73500.00
GM-5	12/16/1994	GM-5	790	<1000	<1	<100	110	900.00
GM-5	02/22/1995	GM-5	2400	<1000	<1	<100	63	2463.00
GM-5	05/23/1995	GM-5	<100	<1000	<1	<100	24	24.00
GM-5	07/11/1995	GM-5	<100	<1000	<1	<100	<5	0.00
GM-5	08/02/1995	GM-5	2000	<1000	<1	<100	<5	2000.00
GM-5	08/30/1995	GM-5	<100	<1000	<1	<100	<5	0.00
GM-5	10/05/1995	GM-5	<100	<1000	<1	<100	<5	0.00
GM-5	12/08/1995	GM-5	57000	<50000	3.1	<5000	<250	60100.00
GM-5	01/18/1996	GM-5	740	<1000	<1	<100	75	815.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-5	02/21/1996	GM-5	10000	<5000	<1	<500	82	10082.00
GM-5	03/04/1996	GM-5	2800	900	<5.0	130	590	4420.00
GM-5	04/11/1996	GM-5	NT	NT	<5.0	NT	NT	0.00
GM-5	04/11/1996	GM-5	4200	<2500	NT	<250	57	4257.00
GM-5	04/26/1996	GM-5	420	<250	<5.0	29	370	819.00
GM-5	05/09/1996	GM-5	120	<100	<5.0	<10	24	144.00
GM-5	05/22/1996	GM-5	15000	140	<5.0	850	160	16150.00
GM-5	06/03/1996	GM-5	3600	2100	<1.0	190	40	5930.00
GM-5	06/24/1996	GM-5	3500	2800	<5.0	150	140	6590.00
GM-5	07/10/1996	GM-5	7400	4300	<5.0	410	28	12138.00
GM-5	07/25/1996	GM-5	4200	1000	<5.0	320	220	5740.00
GM-5	08/07/1996	GM-5	3200	1300	<5.0	240	480	5220.00
GM-5	08/23/1996	GM-5	10000	<5000	<1	<500	78	10078.00
GM-5	09/04/1996	GM-5	25000	<10000	<1	<1000	<50	25000.00
GM-5	09/27/1996	GM-5	<500	<5000	<1	<500	1200	1200.00
GM-5	10/16/1996	GM-5	1200	<2000	<1	<200	230	1430.00
GM-5	11/07/1996	GM-5	200	<1000	<1	<50	50	250.00
GM-5	11/26/1996	GM-5	560	<200	<1	<100	220	780.00
GM-5	12/19/1996	GM-5	350	<200	<1	240	<10	590.00
GM-5	01/02/1997	GM-5	<50	<100	<1	<50	7	7.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-5	01/14/1997	GM-5	78	<100	<1	<50	<5	78.00
GM-5	02/24/1997	GM-5	150	<100	<1	<50	120	270.00
GM-5	03/13/1997	GM-5	<50	<100	<1	<50	5	5.00
GM-5	03/25/1997	GM-5	<50	<100	<1	<50	130	130.00
GM-5	04/01/1997	GM-5	<50	<100	<1	<50	160	160.00
GM-5	04/10/1997	GM-5	<50	<100	<1	<50	70	70.00
GM-5	04/16/1997	GM-5	<250	<500	<0.001	<250	290	290.00
GM-5	04/22/1997	GM-5	<100	<200	<1	<100	470	470.00
GM-5	04/30/1997	GM-5	<500	<1000	<1	<500	410	410.00
GM-5	05/09/1997	GM-5	<50	<100	<1	<50	120	120.00
GM-5	05/15/1997	GM-5	<50	<100	<1	<50	<5	0.00
GM-5	05/23/1997	GM-5	<50	<100	<1	<50	55	55.00
GM-5	05/28/1997	GM-5	<50	<100	<1	<50	170	170.00
GM-5	06/05/1997	GM-5	<100	<200	<1	<100	410	410.00
GM-5	06/13/1997	GM-5	<250	<500	<1	<250	870	870.00
GM-5	06/19/1997	GM-5	<100	<200	<0.001	<100	370	370.00
GM-5	07/23/1997	GM-5	<50	<100	<1	<50	240	240.00
GM-5	08/28/1997	GM-5	<250	<500	<1	<250	630	630.00
GM-5	09/24/1997	GM-5	<250	<500	<1	<250	400	400.00
GM-5	10/27/1997	GM-5	<50	<100	<1	<50	19	19.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-5	11/25/1997	GM-5	<50	<100	<1	<50	510	510.00
GM-5	01/26/1998	GM-5	<50	<100	<1	<50	24	24.00
GM-5	02/25/1998	GM-5	<50	<100	<1	<50	79	79.00
GM-5	03/24/1998	GM-5	<50	<100	<1	<50	270	270.00
GM-5	04/28/1998	GM-5	<20	NT	NT	<20	100	100.00
GM-5	04/28/1998	GM-5	NT	<180	<0.11	NT	NT	0.00
GM-5	05/27/1998	GM-5	NT	<98	<0.11	NT	NT	0.00
GM-5	05/27/1998	GM-5	<20	NT	NT	<20	35	35.00
GM-5	06/23/1998	GM-5	NT	<98	<0.11	NT	NT	0.00
GM-5	06/23/1998	GM-5	<67	NT	NT	<67	430	430.00
GM-5	07/30/1998	GM-5	NT	<98	<0.11	NT	NT	0.00
GM-5	07/30/1998	GM-5	<40	NT	NT	<40	380	380.00
GM-5	08/31/1998	GM-5	NT	<100	<0.1	NT	NT	0.00
GM-5	08/31/1998	GM-5	73	NT	NT	<40	290	363.00
GM-5	09/30/1998	GM-5	<400	NT	NT	<400	600	600.00
GM-5	09/30/1998	GM-5	NT	<100	<0.1	NT	NT	0.00
GM-5	12/29/1998	GM-5	<40	NT	NT	<40	300	300.00
GM-5	12/29/1998	GM-5	NT	<100	<0.1	NT	NT	0.00
GM-5	03/22/1999	GM-5	<20	NT	NT	<20	59	59.00
GM-5	03/22/1999	GM-5	NT	<100	<0.1	NT	NT	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-5	06/24/1999	GM-5 DL	<20	NT	NT	<20	350	350.00
GM-5	06/24/1999	GM-5	<50	NT	NT	<50	360	360.00
GM-5	06/24/1999	GM-5	NT	<100	<0.1	NT	NT	0.00
GM-5	11/02/1999	GM-5	<20	NT	NT	<20	<5.0	0.00
GM-5	11/02/1999	GM-5	NT	<500	<0.5	NT	NT	0.00
GM-5	12/14/1999	GM-5	<20	NT	NT	<20	<5.0	0.00
GM-5	12/14/1999	GM-5	NT	<1000	<1	NT	NT	0.00
GM-5	12/14/1999	GM-5	NT	<1000	<1	NT	NT	0.00
GM-5	04/14/2000	GM-5	<20	NT	NT	<20	<5.0	0.00
GM-5	04/14/2000	GM-5	NT	<1000	<1	NT	NT	0.00
GM-5	11/21/2000	GM 5	<20	<1000	<1	<20	170	170.00
GM-5	09/19/2001	GM 5	<20	<1000	<1	<20	<5.0	0.00
GM-8	11/01/1987	GM-8	1100000	4500000	NT	13000	1600	5614600.00
GM-8	06/01/1989	GM-8	1001000	3180000	NT	<100	16000	4197000.00
GM-8	06/01/1990	GM-8	760000	NT	NT	<100	<5.0	760000.00
GM-8	03/01/1991	GM-8	<100	<1000	NT	<100	<5.0	0.00
GM-8	06/01/1991	GM-8	87800	45300	NT	404	11.6	133515.60
GM-8	09/01/1991	GM-8	<100	<1000	<1	<100	22	22.00
GM-8	11/01/1991	GM-8	<100	<1000	<1	<100	306	306.00
GM-8	03/01/1992	GM-8	<100	<1000	<1	<100	<5.0	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-8	06/01/1992	GM-8	<100	<1000	<1	<100	<5.0	0.00
GM-8	09/01/1992	GM-8	<100	<1000	<1	<100	<5.0	0.00
GM-8	12/02/1992	GM-8	<100	<1000	<1	<100	72	72.00
GM-8	03/01/1993	GM-8	<100	<1000	<1	<100	<5.0	0.00
GM-8	03/16/1993	GM-8	<100	<1000	<1	<100	<5	0.00
GM-8	05/01/1993	GM-8	<100	<1000	<1	<100	<5.0	0.00
GM-8	09/01/1993	GM-8	<100	<1000	<1	<100	<5.0	0.00
GM-8	03/25/1994	GM-8	<100	<1000	<1	<100	<5.0	0.00
GM-8	06/21/1994	GM-8	<100	<1000	<1	<100	<5.0	0.00
GM-8	09/01/1994	GM-8	<100	<1000	<1	<100	<5.0	0.00
GM-8	12/16/1994	GM-8	<100	<1000	<1	<100	<5	0.00
GM-8	02/22/1995	GM-8	<100	<1000	<1	<100	<5	0.00
GM-8	05/24/1995	GM-8	<100	<1000	<1	<100	<5	0.00
GM-8	07/11/1995	GM-8	<100	<1000	<1	<100	<5	0.00
GM-8	10/05/1995	GM-8	<100	<1000	<1	<100	<5	0.00
GM-8	01/18/1996	GM-8	<100	<1000	<1	<100	<5	0.00
GM-8	04/11/1996	GM-8	<10	<100	<5.0	<10	<5	0.00
GM-8	07/10/1996	GM-8	<10	<100	<5.0	<10	<5	0.00
GM-8	11/07/1996	GM-8	<100	<1000	<1	<100	<5	0.00
GM-8	03/13/1997	GM-8	<50	<100	<1	<50	<5	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-8	04/01/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	04/10/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	04/16/1997	GM-8	<50	<100	<0.001	<50	<5	0.00
GM-8	04/22/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	04/30/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	05/09/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	05/15/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	05/23/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	05/28/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	06/05/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	06/13/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	06/19/1997	GM-8	<50	<100	<0.001	<50	<5	0.00
GM-8	07/23/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	08/28/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	09/24/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	10/27/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	11/25/1997	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	01/26/1998	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	02/25/1998	GM-8	<50	<100	<1	<50	<5	0.00
GM-8	03/24/1998	GM-8	<50	<100	<1	<50	<5	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-8	04/28/1998	GM-8	NT	<180	<0.11	NT	NT	0.00
GM-8	04/28/1998	GM-8	<20	NT	NT	<20	<5.0	0.00
GM-8	05/27/1998	GM-8	NT	<98	<0.11	NT	NT	0.00
GM-8	05/27/1998	GM-8	<20	NT	NT	<20	<5.0	0.00
GM-8	06/23/1998	GM-8	<20	NT	NT	<20	<5	0.00
GM-8	06/23/1998	GM-8	NT	<98	<0.11	NT	NT	0.00
GM-8	07/30/1998	GM-8	<20	NT	NT	<20	<5	0.00
GM-8	07/30/1998	GM-8	NT	<98	<0.11	NT	NT	0.00
GM-8	08/31/1998	GM-8	NT	<100	<0.1	NT	NT	0.00
GM-8	08/31/1998	GM-8	<20	NT	NT	<20	<5	0.00
GM-8	09/30/1998	GM-8	<20	NT	NT	<20	<5	0.00
GM-8	09/30/1998	GM-8	NT	<100	<0.1	NT	NT	0.00
GM-8	12/29/1998	GM-8	NT	<100	<0.1	NT	NT	0.00
GM-8	12/29/1998	GM-8	<20	NT	NT	<20	<5.0	0.00
GM-8	03/22/1999	GM-8	<20	NT	NT	<20	<5.0	0.00
GM-8	03/22/1999	GM-8	NT	<100	<0.1	NT	NT	0.00
GM-8	06/24/1999	GM-8	<20	NT	NT	<20	<5.0	0.00
GM-8	06/24/1999	GM-8	NT	<100	<0.1	NT	NT	0.00
GM-8	11/02/1999	GM-8	<20	NT	NT	<20	<5.0	0.00
GM-8	11/02/1999	GM-8	NT	<500	<0.5	NT	NT	0.00

Unisys
Corporate Environmental Affairs

NT=Not analyzed

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
GM-8	12/14/1999	GM-8	<20	NT	NT	<20	<5.0	0.00
GM-8	12/14/1999	GM-8	NT	<1000	<1	NT	NT	0.00
GM-8	12/14/1999	GM-8	NT	<1000	<1	NT	NT	0.00
GM-8	04/14/2000	GM-8	<20	NT	NT	<20	<5.0	0.00
GM-8	04/14/2000	GM-8	NT	<1000	<1	NT	NT	0.00
GM-8	11/21/2000	GM 8	<20	<1000	<1	<20	<5.0	0.00
GM-8	09/19/2001	GM 8	<20	<1000	<1	<20	<5.0	0.00
MW-13	03/01/1993	MW-13	<100	<1000	<1	<100	<5.0	0.00
MW-13	03/17/1993	MW-13	<100	<1000	<1	<100	<5	0.00
MW-13	05/01/1993	MW-13	<100	<1000	<1	<100	<5.0	0.00
MW-13	09/01/1993	MW-13	<100	<1000	<1	<100	<5.0	0.00
MW-13	03/25/1994	MW-13	<100	<1000	<1	<100	<5.0	0.00
MW-13	06/22/1994	MW-13	<100	<1000	<1	<100	<5.0	0.00
MW-13	09/01/1994	MW-13	<100	<1000	<1	<100	<5.0	0.00
MW-13	12/16/1994	MW-13	<100	<1000	<1	<100	<5	0.00
MW-13	02/22/1995	MW-13	<100	<1000	<1	<100	<5	0.00
MW-13	05/23/1995	MW-13	<100	<1000	<1	<100	<5	0.00
MW-13	07/11/1995	MW-13	<100	<1000	<1	<100	<5	0.00
MW-13	10/05/1995	MW-13	<100	<1000	<1	<100	<5	0.00
MW-13	01/18/1996	MW-13	<100	<1000	<1	<100	<5	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
MW-13	04/11/1996	MW-13	<10	<100	<5.0	<10	<5	0.00
MW-13	07/10/1996	MW-13	<10	<100	<5.0	<10	<5	0.00
MW-13	11/06/1996	MW-13	<100	<1000	<1	<100	<5	0.00
MW-13	03/13/1997	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	04/01/1997	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	05/15/1997	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	06/19/1997	MW-13	<50	<100	<0.001	<50	<5	0.00
MW-13	07/23/1997	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	08/28/1997	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	09/24/1997	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	10/27/1997	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	11/25/1997	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	01/26/1998	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	02/25/1998	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	03/24/1998	MW-13	<50	<100	<1	<50	<5	0.00
MW-13	04/28/1998	MW-13	<20	NT	NT	<20	<5.0	0.00
MW-13	04/28/1998	MW-13	NT	<180	<0.11	NT	NT	0.00
MW-13	05/27/1998	MW-13	NT	<98	<0.11	NT	NT	0.00
MW-13	05/27/1998	MW-13	<20	NT	NT	<20	<5.0	0.00
MW-13	06/23/1998	MW-13	<20	NT	NT	<20	<5	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
MW-13	06/23/1998	MW-13	NT	<98	<0.11	NT	NT	0.00
MW-13	07/30/1998	MW-13	NT	<98	<0.11	NT	NT	0.00
MW-13	07/30/1998	MW-13	<20	NT	NT	<20	<5	0.00
MW-13	08/31/1998	MW-13	NT	<100	<0.1	NT	NT	0.00
MW-13	08/31/1998	MW-13	<20	NT	NT	<20	<5	0.00
MW-13	09/30/1998	MW-13	<20	NT	NT	<20	<5	0.00
MW-13	09/30/1998	MW-13	NT	<100	<0.1	NT	NT	0.00
MW-13	12/29/1998	MW-13	<20	NT	NT	<20	<5.0	0.00
MW-13	12/29/1998	MW-13	NT	<100	<0.1	NT	NT	0.00
MW-13	03/22/1999	MW-13	<20	NT	NT	<20	<5.0	0.00
MW-13	03/22/1999	MW-13	NT	<100	<0.1	NT	NT	0.00
MW-13	06/24/1999	MW-13	<20	NT	NT	<20	<5.0	0.00
MW-13	06/24/1999	MW-13	NT	<100	<0.1	NT	NT	0.00
MW-13	11/02/1999	MW-13	<20	NT	NT	<20	<5.0	0.00
MW-13	11/02/1999	MW-13	NT	<500	<0.5	NT	NT	0.00
MW-13	12/14/1999	MW-13	<20	NT	NT	<20	<5.0	0.00
MW-13	12/14/1999	MW-13	NT	<1000	<1	NT	NT	0.00
MW-13	12/14/1999	MW-13	NT	<1000	<1	NT	NT	0.00
MW-13	04/14/2000	MW-13	NT	<1000	<1	NT	NT	0.00
MW-13	04/14/2000	MW-13	<20	NT	NT	<20	<5.0	0.00

NT=Not analyzed

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
MW-13	11/21/2000	MW 13	<20	<1000	<1	<20	<5.0	0.00
MW-13D	06/01/1992	MW-13D	21	<1000	<1	<100	<5.0	21.00
MW-13D	09/01/1992	MW-13D	<100	<1000	<1	<100	<5.0	0.00
MW-13D	12/02/1992	MW-13D	<100	<1000	<1	<100	<5.0	0.00
MW-13D	03/01/1993	MW-13D	<100	<1000	<1	<100	<5.0	0.00
MW-13D	03/17/1993	MW-13D	<100	<1000	<1	<100	<5	0.00
MW-13D	05/01/1993	MW-13D	<100	<1000	<1	<100	<5.0	0.00
MW-13D	09/01/1993	MW-13D	<100	<1000	<1	<100	<5.0	0.00
MW-13D	03/25/1994	MW-13D	<100	<1000	<1	<100	<5.0	0.00
MW-13D	06/22/1994	MW-13D	<100	<1000	<1	<100	<5.0	0.00
MW-13D	09/01/1994	MW-13D	<100	<1000	<1	<100	<5.0	0.00
MW-13D	12/16/1994	MW-13D	<100	<1000	<1	<100	<5	0.00
MW-13D	02/22/1995	MW-13D	<100	<1000	<1	<100	<5	0.00
MW-13D	05/23/1995	MW-13D	<100	<1000	<1	<100	<5	0.00
MW-13D	07/11/1995	MW-13D	<100	<1000	<1	<100	<5	0.00
MW-13D	01/18/1996	MW-13D	<100	<1000	<1	<100	<5	0.00
MW-13D	04/11/1996	MW-13D	<10	<100	<5.0	<10	<5	0.00
MW-13D	07/10/1996	MW-13D	<10	<100	<5.0	<10	<5	0.00
MW-13D	11/06/1996	MW-13D	<100	<1000	<1	<100	<5	0.00
MW-13D	03/13/1997	MW-13D	<50	<100	<1	<50	<5	0.00

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
MW-13D	04/01/1997	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	05/15/1997	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	06/19/1997	MW-13D	<50	<100	<0.001	<50	<5	0.00
MW-13D	07/24/1997	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	08/28/1997	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	09/24/1997	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	09/24/1997	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	10/27/1997	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	11/25/1997	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	01/26/1998	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	02/25/1998	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	03/24/1998	MW-13D	<50	<100	<1	<50	<5	0.00
MW-13D	04/28/1998	MW-13D	<20	NT	NT	<20	<5.0	0.00
MW-13D	04/28/1998	MW-13D	NT	<180	<0.11	NT	NT	0.00
MW-13D	05/27/1998	MW-13D	NT	<98	<0.11	NT	NT	0.00
MW-13D	05/27/1998	MW-13D	<20	NT	NT	<20	<5.0	0.00
MW-13D	06/23/1998	MW-13D	<20	NT	NT	<20	<5	0.00
MW-13D	06/23/1998	MW-13D	NT	<98	<0.11	NT	NT	0.00
MW-13D	07/30/1998	MW-13D	NT	<98	<0.11	NT	NT	0.00
MW-13D	07/30/1998	MW-13D	<20	NT	NT	<20	<5	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
MW-13D	08/31/1998	MW-13D	NT	<100	<0.1	NT	NT	0.00
MW-13D	08/31/1998	MW-13D	<20	NT	NT	<20	<5	0.00
MW-13D	09/30/1998	MW-13D	NT	<100	<0.1	NT	NT	0.00
MW-13D	09/30/1998	MW-13D	<20	NT	NT	<20	<5	0.00
MW-13D	12/29/1998	MW-13D	<20	NT	NT	<20	<5.0	0.00
MW-13D	12/29/1998	MW-13D	NT	<100	<0.1	NT	NT	0.00
MW-13D	03/22/1999	MW-13D	<20	NT	NT	<20	<5.0	0.00
MW-13D	03/22/1999	MW-13D	NT	<100	<0.1	NT	NT	0.00
MW-13D	06/24/1999	MW-13D	<20	NT	NT	<20	<5.0	0.00
MW-13D	06/24/1999	MW-13D	NT	<100	<0.1	NT	NT	0.00
MW-13D	11/02/1999	MW-13D	<20	NT	NT	<20	<5.0	0.00
MW-13D	11/02/1999	MW-13D	NT	<500	<0.5	NT	NT	0.00
MW-13D	12/14/1999	MW-13D	<20	NT	NT	<20	<5.0	0.00
MW-13D	12/14/1999	MW-13D	NT	<1000	<1	NT	NT	0.00
MW-13D	12/14/1999	MW-13D	NT	<1000	<1	NT	NT	0.00
MW-13D	04/14/2000	MW-13D	NT	<1000	<1	NT	NT	0.00
MW-13D	04/14/2000	MW-13D	<20	NT	NT	<20	<5.0	0.00
MW-13D	11/21/2000	MW 13D	<20	<1000	<1	<20	<5.0	0.00
MW-13D	09/19/2001	GM 13D	<20	<1000	<1	<20	<5.0	0.00
MW-13DD	06/01/1992	MW-13DD	150	<1000	<1	19	<5.0	169.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
MW-13DD	09/01/1992	MW-13DD	<100	<1000	<1	<100	<5.0	0.00
MW-13DD	12/02/1992	MW-13DD	<100	<1000	<1	<100	<5.0	0.00
MW-13DD	03/01/1993	MW-13DD	<100	<1000	<1	<100	<5.0	0.00
MW-13DD	03/17/1993	MW-13DD	<100	<1000	<1	<100	<5	0.00
MW-13DD	05/01/1993	MW-13DD	<100	<1000	<1	<100	<5.0	0.00
MW-13DD	09/01/1993	MW-13DD	<100	<1000	<1	<100	<5.0	0.00
MW-13DD	03/25/1994	MW-13DD	<100	<1000	<1	<100	<5.0	0.00
MW-13DD	06/22/1994	MW-13DD	<100	<1000	<1	<100	<5.0	0.00
MW-13DD	09/01/1994	MW-13DD	<100	<1000	<1	<100	<5.0	0.00
MW-13DD	12/16/1994	MW-13DD	<100	<1000	<1	<100	<5	0.00
MW-13DD	02/22/1995	MW-13DD	<100	<1000	<1	<100	<5	0.00
MW-13DD	05/23/1995	MW-13DD	<100	<1000	<1	<100	<5	0.00
MW-13DD	11/06/1996	MW-13DD	<100	<1000	<1	<100	<5	0.00
MW-13DD	03/13/1997	MW-13DD	<50	<100	<1	<50	<5	0.00
MW-13DD	09/30/1998	MW-13DD	NT	<100	<0.1	NT	NT	0.00
MW-13DD	09/30/1998	MW-13DD	<20	NT	NT	<20	<5	0.00
MW-13DD	12/29/1998	MW-13DD	<20	NT	NT	<20	<5.0	0.00
MW-13DD	12/29/1998	MW-13DD	NT	<100	<0.1	NT	NT	0.00
MW-13DD	03/22/1999	MW-13DD	<20	NT	NT	<20	<5.0	0.00
MW-13DD	03/22/1999	MW-13DD	NT	<100	<0.1	NT	NT	0.00

NT=Not analyzed

Appendix C
Historical Groundwater Quality Summary
Former Burroughs Facility - 1225 Ridgeway Ave.
Rochester, New York

PERIOD: From 02/01/1987 thru 09/19/2001 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	SAMPLE ID	Acetone (ug/l)	Isopropanol (ug/l)	Methanol (mg/l)	Methyl ethyl ketone (ug/l)	Toluene (ug/l)	Sum of Constituents (ug/l)
MW-13DD	06/24/1999	MW-13DD	<20	NT	NT	<20	<5.0	0.00
MW-13DD	06/24/1999	MW-13DD	NT	<100	<0.1	NT	NT	0.00
MW-13DD	11/02/1999	MW13-DD	<20	NT	NT	<20	<5.0	0.00
MW-13DD	11/02/1999	MW13-DD	NT	<500	<0.5	NT	NT	0.00
MW-13DD	12/14/1999	MW-13DD	<20	NT	NT	<20	<5.0	0.00
MW-13DD	12/14/1999	MW-13DD	NT	<1000	<1	NT	NT	0.00
MW-13DD	12/14/1999	MW-13DD	NT	<1000	<1	NT	NT	0.00
MW-13DD	04/14/2000	MW-13DD	<20	NT	NT	<20	<5.0	0.00
MW-13DD	04/14/2000	MW-13DD	NT	<1000	<1	NT	NT	0.00
MW-13DD	11/21/2000	MW 13DD	<20	<1000	<1	<20	<5.0	0.00
MW-13DD	09/19/2001	GM 13DD	<20	<1000	<1	<20	<5.0	0.00

NT=Not analyzed

UNISYS

Focused Evaluation of Remedial Alternatives

Former Burroughs-Unisys Facility
Ridgeway Avenue Site
Rochester, New York

NYSDEC SITE #82-8-075

November 14, 1997

Prepared for:
New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road, Remedial Section C
Albany, New York 12233-7010

Prepared by:

BHE Environmental, Inc.
11733 Chesterdale Road,
Cincinnati, Ohio 45246-3405

UNISYS Corporation
Corporate Environmental Affairs
3199 Pilot Knob Road,
Eagan, MN 55121

Table of Contents Page

Figures

Tables

Appendices

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to recommend the appropriate future remedial alternatives for the former Burroughs-Unisys site in Rochester, New York. Unisys conducted soil sampling in October 1996, and a comprehensive groundwater sampling round in November 1996, after remedial system enhancements made in 1995 were in place for 15 months. The results of this sampling indicate that the NYSDEC-approved remedial system has been extremely successful in reducing contaminant concentrations in the groundwater and soil environment at the Ridgeway Avenue site.

Based on the Fall-1996 soil and groundwater sampling, only two soil samples exhibited acetone concentrations above the remedial action objectives (RAOs). All other site-specific indicator compound (SSIC) concentrations in soil were below the RAOs, or not detected in the samples collected. Groundwater concentrations in all the wells that have historically detected VOCs have shown concentrations deceasing with time to non-detect levels. However, the laboratory Method Detection Limits (MDL) for the analytical test methods selected are commonly greater than the RAOs for groundwater. Therefore, no direct comparison of groundwater concentrations to the RAOs can be made.

Unisys continued operation of the remedial system through November 1996, and, in accordance with the Contingency Plan described in the *Remedial Design for Former Burroughs-Unisys Facility, Rochester, New York* (BHE, March 10, 1995), conducted this focused evaluation of further remedial alternatives. Remedial action alternatives ranging from "no further action" to "continued operation" of the system are evaluated in this report.

1.2 OBJECTIVE AND SCOPE

To determine the most appropriate remedial action at the site, Unisys assessed current soil and groundwater conditions and compared them to historical site conditions. In this report, the residual contaminant concentrations are compared to risk-based action levels as well as the RAOs. The efficiency of the soil vapor and groundwater extraction processes is compared to historical performance to determine if asymptotic conditions have been achieved. After identifying several viable remedial alternatives, a benefit/cost analysis of each is presented.

1.3 REMEDIAL ACTION OBJECTIVES

The soil RAOs which are stated in the Record of Decision (ROD), reflect the NYSDEC-TAGM-4046 *Determination of Soil Clean Up Objectives and Clean Up Level.* The groundwater RAOs reflect SCGs, 10NYCRR Part 5 and 6NYCRR Part 700. For the SSICs they are as follows:

SSIC	Soil RAO (ppm)	Groundwater RAO (ppb)
Acetone	0.11	50
Isopropyl Alcohol	0.11	50
Methanol	0.11	50
Methyl Ethyl Ketone	0.23	50
Toluene	1.5	5

Remedial Action Objective Soil Concentrations using TAGM 4046

Site-specific, risk-based soil cleanup numbers were established by Environmental Standards, Inc. (ESI), and presented in the *Feasibility Study* (ESI, August 1993). Three scenarios were presented for soil concentrations. The most conservative of these was calculated using the Trench Utility Worker Scenario and 1/2 the threshold limit value (TLV) as the maximum allowable air concentration in the trench. The criteria used to establish the action level was a health index (HI) of 1, which is the level of exposure to a specific compound from all significant pathways below which it is unlikely for even a sensitive population to experience adverse health affects.

In the same document, site-specific, risk-based groundwater concentrations were determined for the facility, and it was determined the compound-specific cleanup concentrations for groundwater by setting a HI of 1 (ESI, August 1993). The risk-based assessment included ingestion, dermal contact and inhalation of volatile organics from water use in the home as potential exposure pathways by using the very conservative assumption that the shallow groundwater could be used as a potable drinking water source. This is very unlikely because of the very low yield of the aquifer (see the Record of Decision, NYSDEC, March 1994).

The following table presents the risk-based concentrations for the most conservative soil scenario and the overburden groundwater. Although NYSDEC, in the Record of Decision, did not adopt

the conservative risk-based standards as the site RAOs, they are presented here as a reference for determining the risk to human health posed by residual concentrations of SSICs. All of the compounds of interest have very low toxicity characteristics and, as a result, have high exposure tolerance levels.

SSICs	Soil (ppm)	Overburden Groundwater (ppb)
Acetone	170	8,900
Isopropyl Alcohol	140	2,500
Methanol	44	10,000
Methyl Ethyl Ketone	180	3,300
Toluene	600	1,900

Risk-Based Action Levels for Soil and Groundwater

2.0 BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The Former Burroughs-Unisys facility is located at 1227 Ridgeway Avenue, Rochester, New York. The location of the site is shown on Figure 1. The area surrounding the site is primarily zoned industrial/commercial. The site is bounded to the north by a large parcel owned by Eastman Kodak Company, to the east by commercial business, to the south and southwest by undeveloped parcels owned by 3M Corporation, and to the west by a parcel owned by Dimino Management, Inc.

The site plan is illustrated in Figure 2. The Ridgeway Avenue site consists of a manufacturing building, office building and a warehouse/storage building. Several businesses currently occupy these buildings and include NuKote International, Envotech, Inc., AAC Contracting, Inc., and SeaLand Contractors. In addition, the Acropolis Restaurant is located within the property boundary. The site is mostly covered with asphalt, concrete or buildings, with only a few small, grassy areas. The location of buildings, treatment system, roadways, and the monitoring wells and GW/SVE system are also shown on Figure 2.

2.2 SITE HISTORY

Since the beginning of industrial activity at this site in 1968, solvents have been used for manufacturing carbon copy paper, printer ribbons and other office supply products. Burroughs-Unisys manufactured these products at this facility from 1976 to 1986. Although Burroughs sold the business operations in 1986 to NuKote International, similar manufacturing operations and chemical use continued at this facility. A detailed discussion of the property including ownership and lease agreements is presented in the *Remedial Investigation Report* (Unisys, 1992).

Primary solvents used in the manufacturing process included isopropyl alcohol (isopropanol or IPA), methyl ethyl ketone (2-butanone or MEK), toluene and methanol. These solvents were stored in underground storage tanks (USTs) in the northeast corner of the site. Historical records and environmental investigations revealed that between 1986 and 1992, IPA, methanol, MEK, and toluene were the only chemicals stored in the former USTs, which impacted soil and groundwater beneath the site by 1985. These are four of the five contaminants identified in the ROD as SSICs, and used for the RAOs for soil and groundwater. Acetone, the fifth SSIC, was not stored at the facility. The presence of acetone has been attributed to subsurface biodegradation of IPA (Geraghty & Miller, 1988).

2.3 PREVIOUS INVESTIGATIONS

In response to the impact to soil and groundwater beneath the site, Unisys conducted or authorized several investigations to characterize the extent of contamination and evaluate treatment alternatives for the site. A summary of the activities completed at the site are listed below in chronological order.

1986

In response to an IPA spill that occurred in January 1985 from the location of the former IPA UST (Figure 2), Burroughs installed a recovery well to a depth of 14 feet below ground surface (bgs), and pumped approximately 330 gallons of liquid between April and June 1986. The five USTs were removed in November 1986 and soil samples were collected and analyzed for acetone, methanol, IPA, toluene, and MEK.

1987 - 1988

In response to the soil analytical results, several remedial investigations were conducted to characterize the extent and magnitude of soil/groundwater contamination beneath the site. The

Investigation of Ground-Water Quality Conditions at the Burroughs Office Product Division (Geraghty & Miller, 1987) reported on the installation of nine monitoring wells (GM-1, GM-1D, GM-2, GM-2D, GM-3, GM-3D, GM-4, GM-5, and GM-6) and groundwater samples results collected from these wells in January 1987. A total of 12 additional wells were installed in October and November 1987 as part of this investigation (GM-4D, GM-6D, GM-7, GM-7D, GM-8, GM-9, GM-10, GM-10D, GM-11, GM-11D, GM-12, and GM-12D) and are described in the *Investigation of Ground-Water Quality Conditions and the Burroughs Office Product Division* (Geraghty & Miller, July 1988).

1989

Additional monitoring wells were installed in 1989 to verify the extent and magnitude of volatile organic compounds (VOCs). Dames and Moore's (1989) *Report on Monitoring Well Sampling and Analysis* reported acetone greater than 1,000,000 µg/l in overburden groundwater in the vicinity of the former solvent UST cavity. Toluene was also detected in overburden wells in this area.

In November 1989, a vacuum extraction pilot test was conducted by Terra Vac Corporation to evaluate this technology for soil and groundwater remediation. The results are described in the *Pilot Test Report* (Terra Vac Corporation, 1989). The data showed vacuum extraction to be very effective in removing vapor phase and water phase organics from the subsurface soil and groundwater in overburden and bedrock.

1990

A soil gas survey completed in March 1990 determined soil contamination to be limited to the area immediately surrounding the former solvent UST basin (Figure 2). An Interim Remedial Measures (IRM) workplan was implemented for the soil and groundwater in the vicinity of the former solvent UST tank cavity. Bruck, Hartman, and Esposito (BHE) completed the *Operation Work Plan for the Interim Remedial Measures* (BHE, 1990) which described the technology and outlined the operating procedures.

The IRM included installation of 43 GW/SVE points. The wells were installed at depths ranging from 8 to 20 feet bgs in July 1990 and the system began operating on November 26, 1990 with 16 wells on-line. As a result of extraction, groundwater was lowered an average of 2.6 feet, effectively controlling groundwater flow and contaminant migration.

1991 - 1993

The Remedial Investigation (RI) further characterized the extent of soil and groundwater contamination at the site and evaluated the risk posed to human health and the environment. The first phase was reported in the *Remedial Investigation Report* (Unisys, November 1992). Following NYSDEC review of the report, the *Addendum Remedial Investigation Report* (IES, 1993), was submitted addressing the comments and proposing additional investigative work. The second phase of the RI was reported in the *Addendum II, Remedial Investigation Report* (IES, May 1993).

Pursuant to the Administrative Order on Consent, the *Feasibility Study* (FS) was completed (IES, August 1993), to present, develop, and evaluate remedial action alternatives to effectively remediate the remaining VOCs at the site. Based upon the results of the RI/FS for the site and the criteria identified for evaluation of alternatives, NYSDEC selected IRM enhancements and modifications of the existing GW/SVE.

1994 - 1996

In cooperation with NYSDEC and in response to the ROD (NYSDEC, March 1994), a Remedial Design (RD) describing system modifications and enhancements was presented in the *Remedial Design for the Former Burroughs-Unisys Facility* (BHE, March 1995). The modified system was operated from July 1995 through November 1996 following the dynamic operation schedule outlined in the RD. The *Annual Performance Report of Remedial Activities for Former Burroughs-Unisys Facility* (BHE, September 1996) presents the monitoring and system performance data.

2.4 REMEDIAL SYSTEM STATUS

2.4.1 System Enhancements

The ROD (NYSDEC, March 1994) identified a remediation plan after evaluating the RI/FS. NYSDEC selected enhancements and modifications (Alternative 5 in the ROD) to the IRM GW/SVE system. In cooperation with NYSDEC, Unisys presented the RD (BHE, March 1995) in response to the ROD.

The selected remedial alternative included continued operation of the IRM with documented modifications that included installation of five additional GW/SVE wells, and enhancements that included cycling, evaluation of pulsing, and evaluation of passive air or active water injection to

assist fluid migration. The wells (SV-41 through SV-45) shown on Figure 3, were added to the existing network on May 16, 1995, and the system was restarted on May 30th. After being restarted, the system operated for 12 months on a cycling and pulsing schedule designed to enhance the remediation of previously identified areas impacted by VOCs. The *Annual Performance Report of Remedial Activities for Former Burroughs-Unisys Facility* (BHE, September 1996) presents the monitoring and system performance data.

2.4.2 System Operation And Maintenance

The remedial system is generally capable of running continuously with automatic control of the dual-phase extraction and wastewater treatment systems. The system shown on Figure 4, has been operated and maintained as described in the RD. Regular maintenance has been provided by the treatment operator (Day Environmental - Rochester) to avoid unplanned shut-downs and costly repairs. A water conditioning system was installed to add softening chemicals to cooling water to reduce the buildup of scale in the vacuum pump, pipe, tanks, valves and other system components. The cooling system was also modified to provide continuous blowdown which further slowed the buildup of scale in the blower and reduced the frequency and duration of blower cleaning events.

2.4.3 Dynamic Operation

The dynamic operation mode included periodically changing the wells on-line and open to the atmosphere to promote more complete removal of contaminants from soil and groundwater, as described in the RD. The program of dynamic operation of extraction wells was established to maximize the effectiveness of the remediation system. The basic principals of dynamic operation include pulsing, air injection, and cycling are described in the RD and the *Annual Performance Report of Remedial Activities for Former Burroughs-Unisys Facility* (BHE, September 1996).

2.5 SITE GEOLOGY

Pleistocene-age glacial lake sediments composed predominantly of brown-to-tan clayey silt with occasional fine sand overlie shale and limestone bedrock. These sediments generally range in thickness from approximately 10 to 20 feet. Cross section A-A' illustrates the site geology (Figure 5) from southwest to northeast across the site.

The Irondequoit Limestone Formation consisting of interbedded dark gray-to-black calcareous shale, and gray-to-light gray dolomite and crystalline limestone is present at the site. A thin

weathered portion of the Rochester Shale Formation was identified above the limestone. The shale appears to be present across most of the site with a maximum thickness of approximately five feet. Bedrock is reported to have a slight regional dip to the south. On site, the bedrock surface slopes to the east with bedrock highs to the north and west.

2.6 SITE HYDROGEOLOGY

Two hydrogeologic units have been identified and monitored at the site for 10 years. These include a water bearing zone in the overburden clay and silt, and bedrock aquifer comprising of the Irondequoit Formation. Twenty seven monitoring wells are currently used for monitoring groundwater quality and water level measurements. The wells are shown on Figure 2. Wells have been designated as "shallow" for those screened in overburden and "deep" for those in bedrock. Historical groundwater elevation data are presented in Appendix A.

2.6.1 Hydraulic Properties

Under non-pumping conditions, the depth to groundwater in the overburden zone varies from 4 to 8 feet bgs with a saturated thickness of 3 to 16 feet. The saturated thickness is greater in the southern portion of the property than in the north. Hydraulic conductivities in the overburden in the southern half of the site are approximately 50 feet per day (ft/day) based on pumping tests at GM-1. Conductivities in the northern portion of the site range from 0.007 to 2.8 ft/day based on slug tests (Geraghty & Miller, 1988).

The bedrock aquifer is monitored by wells with screened intervals ranging from 25 to 40 feet bgs. Groundwater depths range from 5 feet bgs to the south to 25 feet bgs to the north. Deeper bedrock wells (GM-3DD and MW-13DD) have screened intervals from 50 to 60 feet with groundwater depths ranging from 25 to 40 feet bgs indicating a strong downward gradient in the bedrock aquifer. The hydraulic gradient varies from approximately 0.005 in the south and western portions of the site to 0.05 to the northeast. Hydraulic conductivities south of the GW/SVE system range from approximately 13 to 23 ft/day. A zone of lower conductivity exists to the north-northeast where values range from 0.1 to 0.8 ft/day.

2.6.2 Groundwater Elevation and Flow Characteristics

Review of potentiometric surface maps generated from 1987 through 1996 show flow in overburden is consistently to the northeast with an approximate hydraulic gradient of 0.005. Figure 6 shows the potentiometric surface for non-pumping conditions for May 22, 1995.

When the GW/SVE system is operating, overburden groundwater in the area is influenced by the extraction wells and can be lowered 3 to 5 feet depending upon the number of wells on-line. Figure 7 shows the overburden potentiometric surface for July 11, 1995, and represents flow conditions with all extraction wells under vacuum. The cone of depression shows the system hydraulically captures groundwater in the area where SSICs have been detected.

Groundwater in bedrock also flows northeast as shown by the May 22, 1995, potentiometric map (Figure 8). Unlike the overburden aquifer, the bedrock aquifer is not significantly influenced by the groundwater extraction as illustrated by the July 11, 1995, potentiometric map for the bedrock aquifer (Figure 9).

Figures 10 and 11 further illustrate overburden and bedrock potentiometric surfaces for non-pumping and pumping conditions, respectively. The head difference in overburden and bedrock in the southern portion of the property is generally less than three feet. In the northern portion, it increases to 10 to 15 feet as the bedrock gradient steepens.

Well hydrographs, representative of groundwater fluctuations at the site are shown on Figure 12 and Figure 13. Figure 12 shows groundwater fluctuations in overburden (GM-7) and bedrock (GM-7D) in the southern half of the property are similar indicating the two units are hydraulically connected. Head levels in overburden (GM-3) and bedrock (GM-3D) to the north show different responses indicating the bedrock and overburden are not as strongly connected hydraulically in this area (Figure 13).

3.0 CONFIRMATORY SAMPLING

3.1 DETERMINATION OF SAMPLING LOCATIONS

In order to test the effectiveness of the remedial system operations on soil contamination, a boring program was undertaken in October 1996 consisting of eight soil sampling locations. Unisys positioned the location and depth of the samples proximal to the soil samples collected in 1992, 1993, and 1995 which historically exhibited the highest SSIC concentrations, thus borings GB-1

through GB-8 were located near wells SV-43 (acetone detected at 170 ppm in 1995), SV-42 (36 ppm acetone and 1.2 ppm methanol detected in 1995), SV-40 (not previously sampled but representing the furthest southeastern extent of hydraulic capture of the GW/SVE system), MW-13D (15 ppm acetone detected in 1992), SB-4 (9.9 ppm acetone detected in 1992), SB-5 (440 ppm acetone detected in 1992), SB-7 (3.3 ppm toluene and 40 ppm acetone detected in 1992), SB-2 (510 ppm acetone detected in 1992 and proximal to SV-45 with 74 ppm methanol, 110 ppm acetone, and 40 ppm MEK detected in 1995), respectively. Each boring location was within two feet of the original sample location and the sample was taken from a depth, as close as possible, to the original sample depth. Figure 2 shows the locations of the borings.

3.2 FIELD METHODS

From October 22 through October 24, 1996, BHE advanced and sampled soil borings GB-1 through GB-8 to depths ranging from 10 to 11.5 feet below ground surface.

The Geoprobe® sampling system was utilized to conduct the 1996 soil sampling. The Geoprobe® system uses a van-mounted hydraulic assemblage or electric hammer to push a sampling tube. After the sampling tube was pushed to the top of the desired sampling depth, a retractable drive point in the sampling tube was released and the sampler was advanced. The drive point was retracted as the sampling tube was advanced, allowing a soil sample to enter the liner of the sampling tube. The soil sampler was then removed from the boring and the transparent sample tube liner containing the soil sample was removed from the tube. A 1-inch diameter by 2-foot long sampler was used for this investigation.

Borings GB-5, GB-6, GB-7 and GB-8 are located within the fenced area. Since it was not possible for the van to access these locations, an electric hammer was used to drive the Geoprobe® sampling equipment.

To monitor soil vapor conditions a soil vapor sampling kit was used which is designed for the Geoprobe®, consisting of tygon tubing connected to a sample port at the tip of the drive rods. An expendable drive point protected the sample port until the desired sample depth was obtained. The drive rods were retracted causing the expendable point to disconnect and the port to be exposed to the borehole. To monitor vapors a photoionization detector (PID) and an oxygen meter (alternatively) were attached to the tubing at the surface. The vacuum pumps in the instruments work to draw vapors from the more permeable soils through the tubing and into the instrument.

In borings GB-5 and GB-6, the pump was not able to overcome the resistance to vapor flow exhibited by the low-permeability clay. There are no readings for borings GB-1 and GB-8 because groundwater rather than soil vapor was drawn into the drive rods. The soil vapor readings are presented in Table 1.

Soil samples were collected from each boring at the predetermined sampling depth. The steel sampling tube was decontaminated between samples using a wash solution of low-phosphate detergent and tap water followed by a double tap water rinse.

A portion of each sample was placed in a one-quart zip-lock bag for field screening. The soil samples were allowed to warm (greater than 70°F) for at least 20 minutes to promote volatilization. The probe of the PID, calibrated to methane, was inserted into the bag and the highest observed meter response was recorded. These results are also reported on Table 1 in the 8-10 or the 9-11 foot interval.

The soil samples were split (to share with NYSDEC) such that a representative core from each interval were placed into two separate laboratory-supplied glass jars and stored in an ice-filled cooler. One set of soil samples were shipped to IEA Laboratory in Billerica, Massachusetts, and the second set of split soil samples were picked up by Mr. Amar Nagi of NYSDEC, for all of the boring advanced in October 1996.

IEA analyzed the samples for methanol via Method GCS00400.MA, and toluene, acetone, methyl ethyl ketone (MEK, or 2-butanone), and isopropyl alcohol (IPA) via Method 8240 A. The results of the analysis are presented in Section 4.1 of this report.

4.0 SITE CONDITIONS

4.1 VOLATILE ORGANIC COMPOUNDS IN SOIL

Table 2 presents a summary of the soil analytical results from the October 1996 sampling event. To allow a comparison of the previous soil conditions to the current soil conditions, the table includes the previous analytical results for the samples located proximal to each boring. Bold type in the table indicates 1996 SSIC concentrations above the RAOs. The results of the split sample analysis conducted by NYSDEC are also presented in the table. These results are designated with an "a" after the boring number (i.e., GB-5a).

Only two samples submitted to the laboratory for analysis by Unisys contained SSIC concentrations over the RAOs. Both samples exceeded the RAO for acetone (0.11 ppm). Sample GB-5 contained 0.140 ppm and sample GB-8 contained 1.2 ppm acetone.

There were no detections of methanol, MEK or IPA in any of the samples collected. Toluene was detected in two samples at concentrations below the RAO of 1.5 ppm. Sample GB-5 contained 0.015 ppm and sample GB-8 contained 0.27 ppm of toluene.

Figure 14 contains two acetone concentration isopleth maps. The left isopleth represents soil concentrations in samples collected between 1992 and 1995. The isopleth on the right represents the current acetone concentration distribution in the saturated zone based on the 1996 soil sample analytical results. The shaded areas represent concentrations in excess of the RAO for acetone. Figures 15 and 16 are similar isopleths showing historical versus present day toluene and total VOC concentrations, respectively. Since there appear to be no residual concentrations of IPA, methanol, or MEK, individual isopleths were not prepared for these compounds.

4.2 VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER

Historical groundwater quality results are summarized in Appendix B for all monitoring wells at the site. Groundwater samples have been analyzed for the SSICs beginning in 1987 through November 1996.

Concentration versus time graphs for well GM-5 are shown in Appendix C for each SSIC. Concentrations are plotted on an arithmetic and logarithmic scale for each compound. The arithmetic scale illustrates concentrations decreasing over time. The log scale illustrates the same trend, but presents the data with those at or below the MDLs, which then are more easily evaluated.

For the purpose of evaluating samples with concentrations at or below the MDL, a value equal to one-half the MDL was selected for graphing non-detect concentrations, rather than zero. This is an acceptable method for analyzing and evaluating data that includes environmental samples with concentrations at or below the MDL. The red line on the semi-log plot represents one-half the MDL.

VOCs in groundwater have been effectively remediated and confined to the former UST basin area by the GW/SVE system (Figure 2). Wells that have characterized the contaminant plume in this area include GM-3, GM-5, GM-8, GM-10. Historically, acetone and IPA detections have

been higher than toluene and MEK. Methanol was not included in the analyses until 1991 and has generally been at levels at or below the MDLs. This section summarizes the trend of each SSIC compound in overburden groundwater. Although SSIC were occasionally detected in bedrock in the past in the area below the UST basin, no detections have been observed in bedrock wells since December 1994.

Figures 17 through 24 are isoconcentration plots for the SSIC concentrations from samples collected in June 18, 1989 and November 7, 1996. The plots were created using the Environmental Work Bench (EWB) (SESSCO, 1997), a software package for analyzing and presenting environmental data. The interpolation method selected for contouring (by scaled colors for these plots) was the natural neighbor method. Concentrations at or below the MDL were given values equal to one-half the MDL rather than a value of zero. These values are 2.5 µg/l for toluene, 50 µg/l for acetone and MEK, and 500 µg/l for IPA. Methanol was not evaluated graphically since it was not analyzed in 1989. The raw data used to create these plots are in Appendix B.

Acetone

Acetone has historically been the most frequent compound detected, and at the highest concentrations. Acetone was first detected in wells GM-3, GM-5, GM-8, and GM-10 in 1987 at concentrations greater than 1,000,000 µg/l in several of the wells. Figure 17 shows the approximate "worst case" extent of acetone in groundwater for samples collected in June 1989. The GW/SVE system was started in late 1990, and by June 1991 concentrations decreased by several orders of magnitude with some at or below the MDL . By November 1991, acetone remained at concentrations at or below the MDL for all wells except GM-5. Concentrations in this well have varied from non detect to approximately 100,000 µg/l since March 1991. Figure 18 shows the extent of acetone based on the November 1996 sample results. At that time, acetone was 200 µg/l. Concentration versus time graphs for well GM-5 are in Appendix C.

Toluene

Although toluene concentrations have ranged from approximately non detect to 31,000 µg/l, significantly less than acetone and IPA, toluene has consistently only been detected in well GM-5 in 1987 through 1990, although it continues to be present in the groundwater in the vicinity of GM-5. Toluene was detected in 1987 through 1990 at concentrations ranging from less than 10 to 2,300 µg/l. This trend has continued through November 1996, with concentrations falling at or below the MDL of 5 µg/l for some sampling events. Figures 19 and 20 compare the lateral extent

of toluene in overburden groundwater for data collected in 1989 prior to the GW/SVE system start-up, and for November 1996, six years after operation, respectively.

MEK

The highest initial MEK concentration was over 2,000,0000 µg/l from GM-10 in 1987. Figure 21 shows the extent and concentrations of MEK in overburden groundwater for the June 1989 samples when the maximum concentration was 507,000 µg/l in GM-10. Like the other SSICs, the concentration decreased several orders of magnitude from 1987 through June 1990. By September 1991, concentrations were at or below the MDL and have remained at this level through the November 1996. MEK in wells GM-3 and GM-8 was detected only once at 15,000 µg/l and 13,000 µg/l, respectively, in 1987. These have also remained at or below the MDL. Figure 22 shows the extent of MEK concentrations in groundwater for November 1996.

IPA

IPA was detected in wells GM-3 and GM-10 for every sampling event in 1987 through 1991. It was also detected in GM-5 and GM-8, but not consistently. The maximum concentration was detected in GM-3 in 1987 at 20,000,000 µg/l (the highest concentration of any SSIC detected during the history of monitoring at the site). Figure 23 shows the approximate extent of the IPA plume in groundwater for samples collected in June 1989. Wells GM-8 and GM-10 had concentrations greater than 1,000,000 µg/l until fall 1991 when concentrations dropped to or below the MDL in GM-3, GM-8, and GM-10 as a result of the GW/SVE system start-up in late 1990 and degradation of IPA to acetone. Concentrations have remained at or below the MDL for these three wells. IPA concentrations in GM-5 have been at or below the MDL since August 1996. Figure 24 shows the extent of IPA concentrations in groundwater based on the November 1996 sample results.

4.3 INTRINSIC BIOREMEDIATION

4.3.1 Technical Discussion

Intrinsic bioremediation has occurred at the former Burroughs-Unisys Facility. The basis for this conclusion is that the known chemical storage and accidental release was IPA from the USTs, and over time IPA concentrations have decreased while the corresponding acetone concentrations increased. Acetone was not store or used at the facility, and the appearance of acetone is

attributed to the intrinsic biodegradation of IPA. IPA will be degraded by intrinsic microorganisms in groundwater to acetone as demonstrated by the following oxidation equation:

$$C_3H_8O + 1/2\ O_2 \rightarrow H_2O + C_3H_6O$$

IPA *Acetone*

The essential disappearance of IPA and corresponding occurrence of acetone at the Ridgeway Avenue site as biodegredation is evidenced by the persistence of acetone concentrations in the soil and groundwater environment. Acetone was not used or stored at this facility. Acetone concentrations have increased at the site with a parallel and corresponding decrease in IPA concentrations (Geraghty & Miller, 1988). Acetone is less easily oxidized by microorganisms; however, inorganic compounds found in the environment such as nitrates, sulfates, ferric iron, and carbon dioxide can serve as electron acceptors to facilitate oxidation.

$$C_3H_6O + 2\ O_2 \rightarrow CO_2 + H_2O + CH_3COOH$$

Acetone *Acetic Acid*

Once the acetone is reduced to acetic acid, it is readily degraded by microorganisms and the end products are water and carbon dioxide.

$$CH_3COOH + 2\ O_2 \rightarrow CO_2 + 2H_2O$$

Acetic Acid *Carbon Dioxide and Water*

4.3.2 Data Collected

During the November 1996 groundwater sampling event, Unisys analyzed additional parameters to confirm intrinsic bioremediation activity. Three lines of evidence can be used to document the occurrence of biodegredation and natural attenuation at the site:

- geochemical evidence;
- documented loss of contaminant mass at the field scale; and,
- laboratory microcosm studies.

Biodegredation will occur when an indigenous population of organic-degrading microorganisms are present in the aquifer and sufficient concentrations of electron acceptors and nutrients are available to these organisms. The following site parameters were analyzed: dissolved oxygen

(DO), total nitrogen, sulfite/sulfate, total iron, and total heterotroph and acetone degraders plate count.

Figure 25 illustrates the distribution of DO levels in the overburden wells. The DO concentration at the site are typical of groundwater DO levels typically observed in shallow groundwater. As expected, lower levels of DO are associated with the areas of historically elevated concentrations of dissolved VOCs. This would indicate that intrinsic aerobic degradation of dissolved VOCs is occurring at the site.

Total nitrogen was analyzed by the laboratory, rather than a differentiation between nitrite- and nitrate-nitrogen. Figure 26 illustrates that elevated levels of total nitrogen are associated with the historically elevated dissolved VOC concentrations. This also indicates biological activity is occurring in this area of the site.

Figure 27 illustrates the distribution of sulfate in the overburden wells at the site. There was no sulfite detected in the overburden wells. Again, the elevated levels of sulfate are associated with the historical area of elevated dissolved VOC concentrations. This would indicate biological activity is occurring in this area of the site.

The laboratory did not differentiate between ferrous and ferric iron and reported a total iron concentration. Total iron data did not provide a correlation with the historical area of elevated dissolved VOC concentrations.

The following table summarizes the results of the biological plate counts in groundwater samples from the following wells:

Well	GM-3	GM-5	GM-8
Date	11/7/96	11/7/96	11/7/96
Heterotrophs (CFU/ml)	15,700	27,000	9,600
Acetone Degraders (CFU/ml)	140	30	10

CFU/ml = Colony Forming Units per milliliter

The plate counts indicate that microorganisms, specifically acetone degraders, are present in the groundwater.

4.3.3 Conclusions

The decrease in IPA concentrations and the corresponding increase in acetone concentrations in soil and groundwater indicate that intrinsic bioremediation has occurred and continues to occur at the site. The parameters monitored in November 1996 indicate that intrinsic biodegradation is still occurring for acetone by this degradation mechanism. Biodegradation is also occurring with the other SSICs. This natural attenuation and degradation mechanism will continue regardless of the operational status of the GW/SVE system.

4.4 REMEDIAL SYSTEM EFFICIENCY

4.4.1 Groundwater Extraction Rates

As of November 30,1996, a total of 7,552,285 of gallons of groundwater have been extracted from the overburden aquifer since system start-up in November 1990. The historical groundwater treatment system influent and effluent analytical results are presented in Appendix D. Table 3 presents a 1996 monthly summary of the volume of groundwater extracted, volume of cooling and seal water added, and the pounds of VOCs removed. From January 1996 through November 1996, a total of 828,640 gallons of groundwater were extracted by the GW/SVE system. The total mass of VOCs removed during the eleven month period was 8.92 pounds, which equals 0.0000108 lbs of VOCs removed per gallon of groundwater remediated. During that same time period 600,512 gallons of city water were used by the system for cooling and seal water. This water was discharged to the local POTW. This represents a significant (72 % of the groundwater volume) quantity of potable water which is utilized to facilitate the remediation of a very small quantity of contaminants.

4.4.2 Total Organics Removed

Initial mass removal rates were approximately 1,874 pounds per quarter after the IRM system was started in November 1990. By May 1993, approximately 3,300 cumulative pounds of VOCs were recovered by the groundwater treatment system and mass removal rates had fallen to 30 pounds per quarter representing a 98% reduction in the amount of contaminant extracted and treated. In the 2.5 year period from May 1993 to November 1996, 30 additional pounds of VOCs have been recovered. The mass removal rate is down to approximately 2.5 lbs per quarter. Figure 28 is a plot showing a decline in pounds of VOCs removed from groundwater through time, and Figure 29 shows the cumulative pounds of VOC removed since the system was started. Section 4.4.3

contains further discussion of the VOC mass remaining in the subsurface, and the mass of VOCs removed from the soil and groundwater environment. The decline in the mass of contaminants removed is clearly indicative of the contaminant characteristic in a low yield aquifer, and the expected reduction in the removal rates of the GW/SVE system is a clear indication of the effectiveness of the IRM and RD remedial system.

4.4.3 Mass Removed/Remaining

The total mass of dissolved and residual VOCs in the overburden water-bearing zone was calculated for comparison of the initial mass released to remaining mass in the soil environment. The assumptions and calculations are presented in Appendix E. The initial mass of VOCs retained in the soil in the saturated portion of the overburden is estimated at 5,540 pounds. The VOC mass remaining in the soil is 8.23 pounds, based on recent soil and groundwater analytical results. This calculates to 99.85 percent removed by the GW/SVE system. Since the cumulative mass of VOCs removed is approximately 3,300 lbs., 2,200 lbs. of VOCs are unaccounted for. Unquestionably, a significant portion of the unaccounted 2,200 lbs of VOCs is attributed to intrinsic biodegradation as evidenced by the breakdown of IPA to acetone, and other breakdown products of the other SSICs.

4.4.4 Asymptotic Conditions

To demonstrate that groundwater mass recovery rates have met asymptotic conditions, a graph of mass removed versus time was prepared for the GW/SVE system. The graph is a semi-log plot with the mass removed on the y-(log) axis and time on the x-axis. An exponential curve is a preferred estimate for VOC behavior in groundwater. As VOC recovery rates from groundwater get smaller, the rate of removal is controlled by chemical diffusion and dispersion, which are exponential relationships. The resulting line will be analyzed by curvilinear regression to obtain the exponential curve equation:

$$y = C_i k^x$$

Where:

y = mass of compound removed (lbs)
C_i = y value of the curve
k = decay rate
x = time (months).

All exponential functions have an asymptote, and on a semi-log plot, the asymptote data will plot as a horizontal line (parallel to the x-axis). On a linear graph, the asymptote occurs when an obvious change occurs in the slope of a linear graph of the data. When the rate of mass recovery has reached this condition, it is indicative that the treatment capabilities of the GW/SVE system are limited by rate of chemical diffusion and dispersion in the groundwater.

Figure 28 is a graph of total mass of VOCs removed from groundwater versus time. The data is plotted as two curves; pre-system modifications and post modifications. Both plots of the data show a "best fit" exponential line through the data. The equation of the best fit curve for the pre system modification is:

$y = 2E+65\ e^{-0.0044x}$

where, y = Mass VOCs Removed
x = Time (days)
2E+65 = Initial y value of the curve (b)
-0.0044 = rate of decrease of the curve (m)

The equation of the best fit curve for the RD-system modification is:

$y = 2E-06\ e^{0.003x}$

where, y = Total Mass VOCs Removed
x = Time (days)
2E-06 = Initial y value of the curve (b)
0.003 = rate of increase of the curve (m)

The graph demonstrates that VOC mass recovered has followed an exponential relationship. The data plotted as RD-system modification in May 1995, illustrates a horizontal line on the semi-log plot which is indicative of asymptotic conditions and demonstrates that even with the system modifications, an increase in the rate of mass of VOCs recovered has not occurred. The line does illustrate a slight increase in trend, but this is attributed to sampling and system operation variations.

Figure 29 is a graph of cumulative mass removed on the y-axis and time on the x-axis, and illustrates that the system has reached asymptotic conditions and is no longer effectively able to recover significant quantities of dissolved VOCs due to the limitations of chemical diffusion and dispersion. The obvious change in the slope of the graph occurs in May, 1993.

5.0 GROUNDWATER FLOW AND VOC FATE AND TRANSPORT

5.1 OBJECTIVE

The Modular Three-Dimensional Finite Difference Groundwater Flow Model (MODFLOW), and MT3D were run to simulate groundwater flow and solute fate and transport, respectively, for the site. The objective of modeling was to predict the fate of acetone in groundwater once the GW/SVE system is shut-down and steady-state, non-pumping conditions are reached. Acetone was modeled since it was the only SSIC above the RAOs in November 1996. The following section summarizes the modeling results. A more detailed discussion including output results is provided in Appendix F.

5.2 MODEL SETUP

A conceptual model of the site geology and groundwater flow system was developed prior to setting up the model. The objective of the conceptual model were to identify hydrogeologic units, hydrologic processes, and boundaries that control the flow conditions observed at the site.

The model was divided into a non-uniform grid having 54 columns, 44 rows, and two layers. Layer 1 represents the overburden and Layer 2, the bedrock. Model boundaries were based on potentiometric surface and hydraulic gradients determined from water level measurements collected at the site. The upgradient boundary was set up as the recharge constant head boundary and the downgradient boundary was set up as the discharge constant head. No-flow boundaries were established along the two sides of the model domain perpendicular to the constant head boundaries. The grid and boundary conditions are shown on Figure 3 in Appendix F.

5.3 MODEL INPUT

Hydraulic properties input for this MODFLOW run included horizontal and vertical hydraulic conductivity, storage, porosity, constant head, and aquifer thickness. Conductivities were based on slug and pumping test results from overburden and bedrock tests. The discretization of conductivity values are shown on Figure 4 and 5 in Appendix F, respectively. Other input values are listed in the text portion of Appendix F.

MT3D input parameters included background and initial acetone concentrations, contaminant boundary conditions, dispersivity, molecular diffusion, and bulk density of porous media. The site-specific values are presented in Appendix F.

An initial acetone concentration of 200 µg/l was input into the model. Acetone was the only SSIC above the RAOs for the November 1996 sampling event, the most recent prior to the completion of this study. The background concentration was input as zero. Since the contaminant source has been removed, a constant source term was not applied to the area surrounding GM-5.

5.4 MODEL RESULTS AND CONCLUSIONS

After the model was set up, a series of MODFLOW runs were completed for steady-state, non-pumping conditions. Calculated heads were then compared to observed data for calibration purposes. Once a "good-fit" was achieved, MT3D was calibrated and then run through a series of time steps for a period of 10 years. The calibration results are presented in detail in Appendix F.

Calibrated heads for steady-state, non-pumping conditions are shown on Figure 8 and Figure 9 in Appendix F, for overburden and bedrock, respectively. Gradients and flow directions for both water-bearing zones are consistent with potentiometric maps generated from field data.

Acetone in groundwater was simulated for several time steps to better predict transport velocity, migration direction, and concentrations downgradient of GM-5 once the GW/SVE system is shut-down and steady-state conditions resume.

Figure 10 , Figure 11, and Figure 12 in Appendix F show acetone in overburden groundwater for one, two, and five years following system shut-down. After one year, the leading edge of the acetone plume migrated only 15 feet from GM-5, and the maximum concentration decreased from 200 µg/l to 150 µg/l (Figure 10 in Appendix F). Two years after system shut-down the leading edge of the plume migrated approximately 65 feet from GM-5 and the maximum concentration was 50 µg/l. The concentration at the northeast-most property boundary after two years is expected to be only 30 µg/l (Figure 11 in Appendix F). Five years after system shut-down and non-pumping, steady-state conditions are achieved the leading edge of the plume is expected to be 140 feet downgradient of GM-5 with a maximum concentration of 25 µg/l (Figure 12 in Appendix F).

A series of acetone breakthrough curves for several locations in the model domain was created to further illustrate migration characteristics (Figure 13 in Appendix F). These include well GM-5, the downgradient property line, and distances of 100 and 200 feet downgradient of GM-5. The curves show that 40 µg/l will be the maximum acetone concentration at the property boundary 2.7 to 3 years after steady-state, non-pumping conditions are reached. Beyond the property line,

concentrations will continue to decrease as the plume migrates. Concentrations are predicted to be less than 25 µg/l 100 feet downgradient of GM-5 after five years. And after 10 years the maximum concentration will be approximately 10 µg/l 200 feet downgradient of GM-5.

It is anticipated that vertical migration of acetone will be limited to the overburden assuming a vertical hydraulic conductivity and vertical to longitudinal dispersion ratio of zero. The primary vertical migration pathway would be through fractures in the bedrock which cannot be accurately predicted by the model. Review of historical monitoring data from "deep" wells in the area shows no significant vertical migration has occurred.

6.0 SUMMARY AND CONCLUSIONS

Based on extensive groundwater monitoring data (collected from 1987 through 1996), treatment system data (collected from 1990 through 1996), and soil analytical results (collected 1992 through 1996), the following conclusions can be made regarding remediation efforts at the site:

- Groundwater flow in overburden and bedrock has consistently been to the northeast. The limestone/shale bedrock aquifer is separated from the overburden by an underlying shale layer over most of the site and is unaffected by pumping conditions on the northern portion of the site. **The site contaminant transport mechanisms and migration are understood.**

- The GW/SVE system has been very effective in hydraulically controlling groundwater and preventing migration of contaminants from the known contaminant release area. **Approximately 99.85 % VOC removal of subsurface contaminants.**

- Soil confirmation sampling in October 1996 detected only two samples with concentrations above the 0.11 ppm RAO for acetone. The samples were collected from the saturated portion of the overburden from 8 to 11 feet bgs, and had concentrations of 0.14 and 1.2 ppm. **Approximately 99.9 % contaminant removal from the soil environment.**

- Asymptotic conditions have been reached for total VOC mass removed by the GW/SVE system. The GW/SVE system has removed 99.85 percent of the contaminate mass estimated in the saturated zone. During the first 2.5 years of operation from November 1990 through May 1993, the system removed 3,300 cumulative pounds of VOCs. From May 1993 through 1996, only 30 additional pounds of VOCs have been removed. Currently, the mass removal rate is less than one pound per month. **IRM and RD remedial enhancements achieved technological efficiencies for the contaminant removal.**

- A very large volume of groundwater and city water is used to remove a very minor amount of VOCs. Since the system has been in operating in November 1990, a total of 7,552,285 gallons of groundwater have been extracted. During the past year, 600,512 gallons of potable city water were used and discharged to the POTW by the system. Based on recent influent data, a total of 0.0000108 pounds of VOCs are removed per gallon of groundwater extracted. **Implemented remedial system shows diminishing return from continued operation.**

- Since August 1996, acetone and toluene have been the only SSICs detected in groundwater Acetone was the only SSIC detected in the November 1996 sampling event. Wells that have historically had detectable SSIC have exhibited decreasing concentrations over time to levels at or below the MDL. However, the MDL for EPA Method 8240, the approved method in the RD, are greater than the RAOs established for groundwater. **Achieving asymptotic conditions provides direct evidence that the soil and groundwater cleanup was successful and effective.**

- Intrinsic bioremediation is active at the site based on the distribution of dissolved oxygen, total nitrogen, sulfate, and the IPA/acetone ratio versus time. Another indication of intrinsic bio-activity is the mass unaccounted for when comparing the total mass removed (3,300 lbs) to the calculated VOC mass (5,540 lbs) in the saturated zone (field scale reduction). Since current sampling data indicate that less than 10 lbs of VOCs remain in the saturated zone, a portion of the difference of 2,200 lbs is attributed to intrinsic bioremediation. This may be demonstrated by collection of samples for bio-parameters, as discussed in Section 7.3. **Natural attenuation and biodegradation efficiencies may be greater than engineering controls to remediate the last 0.15 % of VOC contaminant mass.**

- The groundwater fate and transport model predicted the acetone plume would reach the northeastern-most property boundary downgradient of GM-5 after two and one-half to three years. The estimated acetone concentration at this time will be below the RAO of 50 µg/l, assuming an initial concentration of 200 µg/l. **Groundwater modeling demonstrates minimal impacts to on-site and off-site areas in this non-potable water source after the termination of the GW/SVE system.**

7.0 FURTHER REMEDIAL ALTERNATIVES

The further remedial alternatives evaluated during this study include:

- no action;
- monitoring-only,
- intrinsic bioremediation; and,
- continued system operation.

A brief description of each alternative follows.

7.1 NO ACTION

Under the ***no action option***, no remedial activities would continue at the site. The GW/SVE system would be turned off, disassembled, decontaminated and removed from the site. The existing monitoring wells would be grouted and abandoned according to New York State code. The current soil and groundwater contaminant concentrations would naturally biodegrade over time; however, no sampling would be conducted to monitor this activity.

7.2 MONITORING-ONLY

Under the ***monitoring-only option***, the remedial system would be turned off but left in place for a limited time based on the post-system shut-down monitoring results. Samples from six core monitoring wells (core wells are GM-3, GM-5, GM-8, GM-10, and GM-13 nest) will be collected prior to system shut-down to establish the pre-shutdown concentrations. If contaminant concentrations increase above the shut-down levels, groundwater monitoring will continue for the core wells (GM-3, GM-5, GM-8, GM-10, and GM-13 nest) on a monthly basis for one year after system shut-down. The initial post shut-down sampling program will consist of weekly sampling of only 5 of the core wells (GM-3, GM-5, GM-8, GM-10), which will be monitoring for the SSICs on a weekly basis for 12-weeks, and monthly thereafter. Downgradient groundwater monitoring wells MW-13 and MW-13D will be monitored monthly for the duration of the post-shutdown period. This core well sampling program will span March-1997 through March-1998, when a *Sampling & Analysis Plan* will be submitted to NYSDEC for review and

comment. At that time, under a separate cover, Unisys will forward a proposal to NYSDEC to reclassify the site from Class 2 to Class 4. The site should qualify for ***no further action*** status if an initial increase in VOC concentrations, anticipated by rebound of the groundwater levels, returns to pre-shutdown concentrations after the 12-week period.

7.3 INTRINSIC BIOREMEDIATION

The ***intrinsic bioremediation option*** will consist of monitoring select wells for SSICs and bioremediation indicators. The bio-indicators to be monitored would include DO, pH, nitrate/nitrite relative concentrations, sulfate/sulfite relative concentrations, and ferric iron/ferrous iron relative concentrations. Wells GM-1, GM-3, GM-5, GM-6, GM-7, GM-8, GM-10, MW-13, MW-14, MW-15, MW-16 would be monitored monthly for three months for the bio-parameters. SSICs would be sampled following the same 12-week program discussed above in Section 2.7.3. The site will qualify for no further action status after the 12-week sampling program, if sampling results indicate that all groundwater concentrations are below the pre-shutdown levels. If concentrations increase several orders of magnitude greater than the pre-shutdown levels, the contingency plan (detailed in Section 9.3) will be implemented.

7.4 CONTINUED OPERATION OF THE EXTRACTION SYSTEM

The last remedial alternative considered is the ***continued operation*** of the GW/SVE system. The program of dynamic operation including pulsing, passive air injection, and cycling described in Section 3.2.2 of the *Annual Performance Report* (BHE September 27, 1996), would be continued. Quarterly monitoring of the groundwater would continue as specified in the RD for six months. At that time, the system would be turned off and no further action requested.

8.0 EVALUATION OF ALTERNATIVES

Seven evaluation criteria have been developed by NYSDEC which address the requirement to select the remedial alternative which most effectively protects human health and the environment. These criteria are presented below and in more detail on Table 4.

1. Compliance with Applicable or Relevant and Appropriate New York State Standards Criteria and Guidelines (SCGs) (Relative Weight = 10).

2. Protection of Human Health and the Environment (Relative Weight = 20).

3. Short-Term Effectiveness (Relative Weight = 10).

4. Long-Term Effectiveness and Permanence (Relative Weight = 15).
5. Reduction of Toxicity, Mobility or Volume (Relative Weight = 15).
6. Implementability (Relative Weight = 15).
7. Cost (Relative Weight = 15).

The ROD identified SSIC RAOs for this site. These are the appropriate standards used to evaluate compliance with the first requirement. Health based standards were determined in a Risk Assessment performed by ESI during the Remedial Investigation. The risk-based corrective action objectives are presented in Section 1.3 of this study and are used to evaluate compliance with the second requirement. To determine the score for the remaining criteria, each remedial alternative was weighted relative to the others. Table 4 summarizes the scores assigned for each of the criteria. A discussion of the evaluation of each of the alternatives is presented in the following sections.

8.1 NO ACTION

The no action scenario will eventually achieve compliance with the RAOs for the site. Since 99.85% of the contaminants have been removed by natural processes and the remedial system, natural processes will complete the remedial process within an estimated time of 2 to 3 years based on the results of the fate and transport model. The score for Criteria #1 is therefore 6/10 points.

The site is already in compliance with the health based standards for soil and groundwater. The score for Criteria #2 is therefore 20/20 points.

The evaluation of short term effectiveness of this option should include consideration of the protection of the community and workers during remedial actions as well as environmental impacts and time to achieve the RAOs. Since there will be no workers involved in this scenario and since exposure to the contaminants by the community will not occur (there is no use of the groundwater in the area), and since shutting down of the system will reduce potential environmental impacts to the air quality, the short term effectiveness of this scenario is good. The time until RAOs are achieved is the only aspect of this criteria which may not be as desirable as alternative remedial actions. The score, therefore, for Criteria #3 is 8/10 points.

The evaluation of the long term effectiveness and permanence of the no action alternative should include consideration of the magnitude of the residual risk, the adequacy of controls, and the

reliability of controls. The controls at this site are the low permeability soils which have prevented the spread of contaminants from the original source area. These are completely reliable and effective; however, without a monitoring program, there is reduced confidence in the controls. Therefore, the score for Criteria #4 for the no action alternative is 14/15 points.

The fifth criteria is reduction of toxicity, mobility, and volume and should include an evaluation of the treatment process used, the amount of contaminants destroyed, the degree of expected reductions in toxicity, mobility and volume, the degree to which the treatment is irreversible, and the type and quantity of hazardous residuals remaining after treatment. The no action alternative depends on intrinsic processes to continue the reduction in toxicity and volume of contaminants and on natural conditions to control the mobility. Since the residual concentrations of contaminants present at the site pose no significant threat to human health, the need to superimpose a treatment system is reduced. Therefore, the score for Criteria #5 is 11/15 points for the no action alternative.

The sixth criteria is implementability and should include an evaluation of the ability to construct and operate, the reliability of the technology, the ease of undertaking additional remedial actions if necessary, the ability to monitor the effectiveness, the availability of necessary equipment and the timing. Since there is no monitoring associated with this technology and, after removing the remedial system, the ease of undertaking additional remedial actions if necessary, will be greatly reduced, the score for Criteria #6 is 9/15 points for the no action alternative.

The final criteria to be considered is the cost of the remedial alternative. This evaluation should include immediate capital costs, operation and maintenance costs, future capital costs, the cost to future land use, and the present worth cost. The no action alternative is by far the least expensive alternative. Although there would be an immediate capital cost in dismantling the system, this cost is eventually incurred in any of the alternatives. There would be no O&M costs or future capital costs. The site would be available for productive use if the remedial system were removed. The score for Criteria #7 is therefore 12/15 points resulting in a total score for the no action alternative of 80/100 points.

8.2 MONITORING-ONLY

Following system shut-down the monitoring-only scenario is based on initial achievement of pre-shutdown concentrations (should rebound levels occur) and future compliance with RAOs. Since 99.85% of the contaminants have been removed by the remedial system, natural processes

will complete the remedial process to RAOs within an estimated time of two to three years based on the fate and transport model. The score for Criteria #1 is therefore 6/10 points.

The site is already in compliance with the health based standards for soil and groundwater. The score for Criteria #2 is therefore 20/20 points.

The evaluation of the short term effectiveness of this option is exactly the same as that for the no action alternative. The score, therefore for Criteria #3 is 8/10 points.

The long term effectiveness of this option receives all possible points because the residual risk is non existent based on the health based remedial action goals. The controls (low permeability soils and in-situ bioremedial activity) that are in place, are adequate and completely effective. Additionally, by monitoring for any residual groundwater concentrations, there will be assurance that the residual contaminants are not migrating off-site. Subsequently, the contingency plan will be implemented if observed concentrations increase above the pre-shutdown levels after the 12-week monitoring period. Therefore, the score for this criteria is 15/15 points.

The reduction of toxicity, mobility, and volume to be achieved by the monitoring-only remedial alternative is the same as that stated for the no action alternative. Therefore, the score for this criteria is 11/15 points.

The implementation of the monitoring-only alternative poses no problem. There is a local consultant currently under contract to collect samples at the site. The laboratory and analytical parameters have already been identified and are fully versed in the methods and protocols required for this project. Since, under this alternative, the remedial system will remain intact until concentrations are at or below the pre-shutdown concentrations at the end of 12 weeks, the ease of undertaking additional corrective actions, if necessary, is preserved and actually prescribed in the contingency plan. The score for this criteria, therefore, is 15/15 points.

The cost of implementing the monitoring-only alternative is relatively inexpensive. Sampling can be performed by local technicians. No additional capital costs will be required. The capital cost for decommissioning the treatment system is postponed until the residual concentrations are reduced to the pre-shutdown concentrations . There is a minimal cost to future land use should the treatment system have to remain in place limiting access to the area. The score for this criteria is therefore, 9/15 points resulting in a total score for the monitoring-only only scenario of 84 points.

8.3 INTRINSIC BIOREMEDIATION

The intrinsic bioremedial alternative is basically the same as the monitoring-only alternative with additional parameters measured at selected wells to document the effectiveness of the naturally occurring remediation. This adds an additional cost to the project and makes the alternative slightly more difficult to implement. Therefore, the intrinsic bioremediation alternative received the same scores as the monitoring-only alternative for all criteria except the implementability and cost categories where slightly lower scores were assigned. This resulted in a total score of 82/100 points for the intrinsic bioremediation alternative.

8.4 CONTINUE REMEDIAL SYSTEM OPERATION

The effectiveness of the remedial system has reached asymptotic levels as demonstrated in earlier sections. Therefore compliance with the RAOs will not be achieved any faster with the system in operation. A score of 6/10 points was assigned to this criteria and is the same score as the other alternatives received.

Considering environmental impacts for continued operation of the system constitute one aspect of Criteria #2 since the remedial system uses a significant amount of energy. The remedial system utilizes a 25 horsepower blower which would consume 18 Kw/hour. Assuming the blower operates at 75% power for 90% of the year the resulting Kw/H used can be calculated as follows:

18 Kw/hour x .75 x .90 x 24 hours/day x 365 days/year = 106,434 KwH/year

Mr. Bernie Zapff of Rochester Gas and Electric (RG&E) indicates that RG&E generates approximately 30% of their electricity from coal and purchases another 15% of the electricity from coal burning plants. According to data compiled in the *Environmental Almanac (*World Resources Institute, 1992*)*, 2.37 lbs. of Carbon Dioxide (CO_2), the most significant greenhouse gas and a leading contributor to global warming, is released to the atmosphere for each KwH of electricity generated by a coal burning plant. Based on these numbers, over 56 tons of CO_2 are released into the atmosphere for each year of operation of the system as shown below:

106,434 KwH x .45 x 2.37 lbs/KwH = 113,511 lbs = 56.7 tons

In addition to CO_2, sulfur dioxide, particulates and other air pollutants are generated by the power plant providing the electricity. Compared to the 3 lbs of total VOCs removed by the

GW/SVE system, it appears that the environmental impacts of providing electricity to operate the system may outweigh the environmental impacts associated with the residual contaminants.

It has already been stated that the current residual contaminant concentrations are well below the health based corrective action concentrations. Therefore, the score for Criteria #2, Protection of Human Health and the Environment, is 16/20 points.

The evaluation of the short term effectiveness of continued operation of the remedial system includes environmental impacts. Also, since the effectiveness of the system has reached asymptotic conditions, it is not believed that the time until RAOs will be achieved will be significantly shorter with the system running than with intrinsic bioremediation alone. Therefore, the score for this criteria is lowered with respect to the other alternatives to 7/10 points.

The long term effectiveness and permanence of the remediation will not be affected by continued operation of the system. Therefore, the same score was assigned to Criteria #4 for this alternative (15/15 points) as was assigned for the monitoring-only and intrinsic bioremediation alternatives.

It may be argued that the continued operation of the system will reduce the mobility of the contaminant plume; however, if the system is shut-down, the low permeability of the aquifer at this site prevents migration of the contaminants significantly. This is illustrated in detail by the fate and transport model results which shows acetone concentrations will decrease to levels below the RAO before reaching the property boundary. Also, by exposing the acetone to fresh electron receptors such as nitrates, sulfates, ferric iron, and carbon dioxide found in the soil, the natural remediation process will be enhanced. Therefore, the score for Criteria #5, Reduction of Toxicity, Mobility and Volume, is 12/15 points.

The continued system operation alternative is the most complicated to implement and operate. The reliability of the system is increasingly suspect both from and O&M and an effectiveness standpoint. The system is not effectively reducing the timing of the clean up since the most effective remedial action at the site is bioremedial. The score for Criteria # 6 is, therefore, 10/15 points.

Since continued operation of the system will involve increasing operation and maintenance with time, the implementability criteria score for continued system operation is the lowest of the alternatives considered. Implementation of the monitoring associated with the monitoring-only

alternative is included in this alternative in addition to the increasing O&M. The score therefore, is 2/15 points. This results in a total score for this alternative of 68/100 points.

9.0 RECOMMENDATIONS

9.1 REMEDIAL ALTERNATIVE SELECTED - MONITORING-ONLY

Based on the analysis of remedial alternatives, the ***monitoring-only option*** appears to be the most cost-effective method of ensuring that human health and the environment are not at risk while natural processes continue to reduce residual concentrations below the RAOs. If pre-shutdown concentrations in the core sampling wells (GM-3, GM-5, GM-8, GM-10, and GM-13 nest) are achieved at the end of the 12-week monitoring period, the remedial system will be decommissioned. If groundwater conditions increase above pre-shutdown conditions after the end of the 12-week monitoring period, the contingency plan described in Section 9.3 of this document will be implemented.

9.2 REMEDIAL SYSTEM CLOSURE

Once pre-shutdown concentrations have been achieved during the 12-week sampling program, and NYSDEC has approved site closure, Unisys will decommission, disassemble, and decontaminate system components. A detailed plan to decommission the system will be developed during the final phase of site remediation. This plan will include the procedures to break down and clean each component of the system prior to removal from the site. These specific procedures can be provided to the NYSDEC at that time upon request.

9.3 CONTINGENCY PLAN

After the groundwater extraction system is shut-down, contaminant concentrations are expected to increase as a result of groundwater rebound. If contaminant concentrations increase above the shutdown levels, an initial 12-week groundwater monitoring will be implemented for the core sampling wells (GM-3, GM-5, GM-8, GM-10, and GM-13 nest) and the data evaluated. If the concentrations of SSICs remain above the RAOs after the 12-week sampling program, the groundwater monitoring will continue on a monthly basis for one year after system shut-down. The initial post shut-down sampling will consist of weekly sampling of 5 of the core wells (GM-3, GM-5, GM-8, GM-10) to be monitored for the SSICs on a weekly basis for 12 weeks, and monthly thereafter, if necessary. This core well sampling program will span March-1997

through March-1998, when a *Sampling & Analysis Plan* will be submitted to NYSDEC for review and comment. If elevated levels of SSICs are detected in GM-5 then the data will be re-evaluated, and if necessary, the system will be operated for an additional one month period. If the contingency plan is initiated and the system is operated for one or months in each of four quarters, a re-evaluation of the effectiveness of the system will be conducted after one year. Groundwater sampling will consist of SSICs for the core monitoring wells, and additional wells if the data suggests the downgradient migration of the plume. If the treatment system does not need to be re-started after a one-year period, Unisys will forward a proposal to NYSDEC to reclassify the site from Class 2 to Class 4.

10.0 REFERENCES

BHE Environmental, Inc., 1990. *Operation Work Plan for the Interim Remedial Measures - Former Burroughs-Unisys Facility, Rochester, New York.*

BHE Environmental, Inc., 1995. *Remedial Design for Former Burroughs-Unisys Facility, Rochester, New York*, March 10, 1995.

BHE Environmental, Inc., 1996. *Annual Performance Report of Remedial Activities for Former Burroughs Unisys Facility, Rochester, New York*, September 27, 1996.

Dames and Moore, 1989. *Report on Monitoring Well Sampling and Analysis Former Burroughs Unisys Facility, Rochester, New York,*

Geraghty and Miller, Inc., 1987. *Investigation of Groundwater Quality Conditions at the Nu-Kote International facility (Formally Burroughs, Inc., Rochester, New York*

Geraghty and Miller, Inc., 1988. *Investigation of Groundwater Quality Conditions at the Burroughs Office Products Division, Rochester, New York*

Integrated Environmental Solutions, Inc., 1992. *Addendum Remedial Investigation Report for Former Burroughs Unisys Facility, Rochester, New York*, May 3,1993.

Integrated Environmental Solutions, Inc., 1993. *Addendum Remedial Investigation Report for Former Burroughs Unisys Facility, Rochester, New York,*

Integrated Environmental Solutions, Inc., 1993. *Draft Feasibility Study Burroughs Unisys Facility*, August 6, 1993.

Supercomputer Systems Engineering and Services Company (SSESCO), 1997. The savi3D User Guide.

Terra Vac Corporation, 1993. *Pilot Test Report, Former Burroughs Unisys Facility, Rochester, New York*_November 1989

World Resources Institute, Houghton Mifflin Company, Boston, 1992. *Information Please Environmental Almanac.*

Unisys, 1992. *Draft Remedial Investigation Report for Former Burroughs Unisys Facility, Rochester, New York,*

UNISYS

DRAFT
REMEDIAL INVESTIGATION REPORT
BURROUGHS-UNISYS SITE
ROCHESTER, NEW YORK
NYSDEC SITE NO. 828075

Volume 1

November 2, 1992

Prepared for:
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233

Prepared by:
UNISYS
Corporate Environmental Affairs
3199 Pilot Knob Road
Eagan, Minnesota 55121

DRAFT
REMEDIAL INVESTIGATION REPORT
BURROUGHS-UNISYS SITE
ROCHESTER, NEW YORK
NYSDEC SITE NO. 828075

November 2, 1992

Prepared for:

New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233

Prepared by:

Unisys Corporation
Suite 400
2200 Renaissance Boulevard
King of Prussia, Pennsylvania 19406

TABLE OF CONTENTS

FIGURES

PLATES

TABLES

APPENDICES

1.0 INTRODUCTION

This report comprises a Remedial Investigation (RI) of the Burroughs Corporation (now Unisys Corporation hereinafter "Unisys") site (hereinafter the Burroughs-Unisys site or "site") in Rochester, New York (Figure 1). The site appears on the New York State Department of Environmental Conservation (NYSDEC) list of inactive waste disposal sites. The site identification number is 828075 and is designated as a class 2A site.

NYSDEC and Unisys executed an Administrative Order on Consent (Order) on February 12, 1990. The Order required Unisys to complete the following activities:

- Design and implement Interim Remedial Measures (IRMs).
- Develop and implement an RI work plan.
- Prepare and submit an RI report and Feasibility Study (FS) report.

IRMs were initiated at the site on November 26, 1990 in accordance with an NYSDEC-approved operations work plan dated May 24, 1990 and are currently ongoing. The RI work plan (Bruck, Hartman & Esposito, 1991) was previously developed and subsequently approved by the NYSDEC. Upon submittal and NYSDEC-approval of this RI report, the only remaining deliverable required by the Order is the preparation and submittal of the FS report.

1.1 Purpose

The objectives of the RI were to determine the nature and extent of the constituents of concern, characterize the surrounding environmental conditions and evaluate the risk posed to human health and the environment, if any. The RI was performed in accordance with the approved RI work plan and revision thereto (Unisys letter dated June 24, 1992 to NYSDEC) and the United States Environmental Protection Agency's (EPA) interim final "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" dated October 1986.

The Order recognized the field investigative activities which were completed prior to the execution of the Order. These investigations, together with the activities recently performed, constitute the completion requirements of the RI. Therefore, the work presented herein comprises the RI for the site which was completed over a period of seven years.

The activities performed as part of the RI included background research and a literature review and field investigative activities. The background review included the collection and evaluation of property ownership (title history), regulatory history and permit status of the site, well inventory records within a 1-mile radius of the site, climate and ecological information, UST removal information, on- and off-site utility locations and historic chemical use and waste management practices. Field investigative activities conducted under the RI included monitoring well installation and groundwater sampling, soil boring completion and soil sampling, IRM system operation and subsequent depth-to-water measurements, topographic surveying, sanitary and storm sewer sampling and laboratory analysis. The mobility and toxicity of identified chemical compounds were also evaluated and a baseline risk assessment was prepared.

1.2 Site Background

Between 1976 and 1987, carbon copy paper, printer ribbons and other office supply products were manufactured by Burroughs-Unisys at a site located at 1227 Ridgeway Avenue, Monroe County, Rochester, New York. While Unisys sold the operations in 1987 to NuKote International, similar manufacturing operations continue at the site. Figure 1 locates the site and Figure 2 illustrates a site plan. Primary solvents used in the manufacturing process included isopropanol (IPA), methyl ethyl ketone (MEK), toluene and methanol. These solvents were historically stored in underground storage tanks (USTs) in the northeast corner of the site (see Figure 2). Comprehensive on-site environmental investigations conducted between 1986 and 1990 have indicated that the former USTs have impacted soil and groundwater beneath the site.

1.2.1 Site Description

The Burroughs-Unisys site is located within a 4.6-acre industrial parcel owned by Frank Dimino, Inc. The site consists of a manufacturing building, office building and a warehouse/storage building. Several businesses currently occupy these buildings and include NuKote International, Envotech, Inc., AAC Contracting, Inc. and SeaLand Contractors. In addition, the Acropolis Restaurant is located within the property boundary. The site is largely paved with only a few small grassy patches.

The area surrounding the site is largely industrial/commercial. The site is bounded to the north by a large parcel owned by Eastman Kodak Company, to the east by commercial businesses, to the south and southwest by undeveloped parcels owned by 3M Corporation and to the west by a parcel owned by Frank Dimino, Inc.

The Erie Canal was formerly located west and southwest of the site on property now owned by 3M Corporation. The canal was deeded to the city of Rochester and reported to have been filled by the City with unknown fill materials.

1.2.2 Site History

1.2.2.1 Property Ownership History

A review of the title history was conducted at the Monroe County Courthouse to determine past ownership. The property, a portion of which is known as 1227 Ridgeway Avenue, is currently owned by Mr. Frank Dimino and his wife, Mrs. Helen Dimino. Frank and Helen Dimino purchased the property from Mr. William R. Hanely in January 1961. Mr. Hanely was identified as the occupant in the New York Polk's Directories from 1950 to 1960.

Figure 3 shows Parcel A which includes 1227 Ridgeway Avenue and the parcels immediately surrounding the area. The property immediately west-southwest (Parcel C) was the former Erie Canal, which was sold by the city of Rochester to the 3M Corporation in August 1975, and a 2.189-acre portion of the former Erie Canal (Parcel B), which fronts Ridgeway Avenue, was conveyed to Frank and Helen Dimino in

October 1976. A 0.7-acre portion of property (Parcel D), which was a portion of the original parcel purchased by the Diminos from Mr. William Hanely, was conveyed to 3M Corporation by the Diminos in September 1976. This 0.7-acre parcel is immediately south of the site. Appendix A contains copies of the property titles.

The site, identified as 1227 Ridgeway Avenue, is currently occupied under lease by NuKote International. In addition, the property parcel includes connected buildings identified as 1229, 1231, and 1233 Ridgeway Avenue which have been leased to one or more businesses at a time. NuKote International purchased the operation (including the property lease of 1227 Ridgeway Avenue) from Unisys Corporation, formerly Burroughs Corporation, successor by merger to Sperry Corporation. Burroughs Corporation assumed the lease from KeeLox Manufacturing Company in a bankruptcy proceeding in March 1976.

KeeLox Manufacturing Company originally leased 1231 Ridgeway Avenue from Frank Dimino, Inc. on March 5, 1968. The amount of space originally leased by KeeLox Manufacturing Company is not known. Another section of the building, identified as 1229 Ridgeway Avenue (presumably an office area with frontage on Ridgeway Avenue), was occupied by the Gardner-Denver Company from 1973 to 1977 and by Clover Pool Supply Company from 1979 to 1981.

Burroughs Corporation obtained a lease option for 1227 Ridgeway Avenue from Frank Dimino, Inc. after Burroughs Corporation assumed the KeeLox Manufacturing Company lease in 1976. Burroughs signed a ten-year lease effective November 15, 1976 for 14,570 square feet and expanded the occupancy of the property in 1985 reflected in a five-year lease to commence February 15, 1985. This lease required full occupancy of the 1231 Ridgeway Building as well no later than November 1, 1985. The amount of space included approximately 70,000 square feet; however, it did not include the Acropolis Restaurant located at 1233 Ridgeway Avenue which still occupies that location.

In 1987, Unisys Corporation sold its office products operations and the lease to NuKote International. NuKote International currently occupies the site and conducts manufacturing operations similar to KeeLox Manufacturing Company and Burroughs-Unisys Corporation.

1.2.2.2 Aerial Photograph Review

Aerial photographs and C. M. Hopkins Plat Maps were viewed at the Rochester City Hall Maps and Survey Office and the public library to determine past on-site and off-site activities in the general area of the site. Descriptions of these are provided below. In addition, the Monroe County Environmental Management Council prepared a description of the aerial photographs not viewed by Unisys from the years of 1961, 1970 and 1978. These descriptions are also provided below.

The property, a portion of which is known as 1227 Ridgeway Avenue, is shown on the C. M. Hopkins Plat Map as an area originally plated for residential development as shown by the small-sized lots and planned streets. The C.M. Hopkins Plat Map shows the property is east of the former Erie Canal and west of Driving Park Avenue which was never constructed and was undeveloped except for a small structure on the banks of the canal. The former Erie Canal was deeded to the city of Rochester and reported to have been filled by the City with unknown fill materials. The property was listed as owned by John E. Johnson on the C. M. Hopkins Plat Map. There was no development east or south of the property. North of the property and across Ridgeway Avenue is an Eastman Kodak Corporation facility.

A 1951 aerial photograph shows no activity on the property. A 1958 aerial photograph shows the area surrounding the property as undeveloped except for a bowling alley and a structure of indeterminate use.

In 1961, filling is occurring south of two buildings which exist on the property at this time. A 1970 aerial photograph indicates that since 1961, additional filling has occurred throughout most of the property; at this time most of the property is level whereas in 1961 the southern portion of the property slopes to the south. Also since 1961, an area southwest of the property (on the former Erie Canal) has been cleared of trees. This area appears to have been used as storage. Filling is occurring west of the building (L-shaped) located in the northwest portion of the property, along Ridgeway Avenue.

A 1972 aerial photograph of the property shows the 1227 and 1225 Ridgeway Avenue buildings developed with the area immediately west (the former Erie Canal) of the property undeveloped and overgrown with vegetation. The 1972 aerial photograph

shows an area of the former Erie Canal immediately southwest of the property used for the storage of what appears to be construction equipment. Access to the storage yard is from the 0.7-acre Dimino parcel south of the property, where a limited amount of equipment is stored.

A 1978 aerial photograph shows that additional trees have been cleared in proximity to the former Erie Canal east of the property; some stockpiles of unidentified material exist in this newly-cleared area. The area which was cleared by 1970 is used for storage. To the west of this area, active filling is occurring over the former canal bank. It appears this filling is spreading to property in the town of Greece.

A 1979 aerial photograph shows that the property is unchanged from the 1972 aerial photograph except the photograph reflects the property transfer from the Diminos to 3M Corporation. The former equipment storage area southwest of the property was moved to an area immediately west of the property. No equipment was shown to be stored on the 0.7-acre parcel immediately south of the property.

1.2.2.3 Regulatory History

Public records were reviewed to determine the proximity of any facilities listed due to environmental issues. Data for the sites listed in this section were obtained from several lists and databases from Federal and State environmental regulatory agencies for the zip codes 14615 and 14606. The sources of information are:

- National Priorities (Superfund) List (NPL) - Environmental Protection Agency's (EPA) database of uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the Superfund Program. A search of the 1991 NPL revealed that no sites were found within the stated zip code areas.

- Facility Index System (FINDS) - a compilation of any property or site which the EPA has investigated, reviewed or been made aware of in connection with its various regulatory agencies.

- Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) - a compilation of sites which EPA has investigated or is currently investigating for releases or threatened release pursuant to the Superfund Act. The 1991 CERCLIS file was used for this search.

- Emergency Response Notification System (ERNS) - a database of information on reported releases of oil and hazardous substances. The database contains information from spill reports made to Federal authorities including the EPA, U.S. Coast Guard, National Response Center, and the Department of Transportation. The period 1987 through 1991 was reviewed for this report.

- New York State Registry of Inactive Hazardous Waste Disposal Sites (Registry) - an inventory of all actual or suspected inactive hazardous waste sites in the State of New York.

- Resource Conservation and Recovery Act Administration Action Tracking System (RAATS) - tracks and records Resource Conservation and Recovery Act (RCRA) Section 3008 compliance orders and orders on consent for the Office of Waste Programs Enforcement.

The results of the search of these databases are provided in Appendix B. In summary, the results indicate that within the property boundary, the companies that have been listed in the databases are Burroughs Corporation, Clover Pool Supply Company, NuKote International and SeaLand Contractors. Burroughs Corporation is listed with the Office of Air and Radiation for an air permit and is listed as a NYSDEC inactive hazardous waste disposal site. Clover Pool Supply Company is listed with the Office of Pesticide and Toxic Substances because regulated chemicals (pool-related chemicals) were formerly stored and sold at the site. NuKote International is listed with the Office of Solid Waste for the generation of hazardous waste and with the Offices of Toxic Substances and Air and Radiation for an Air Permit. Finally, SeaLand Contractors are listed with the Office of Solid Waste for the generation of hazardous waste.

Several other off-site facilities were listed in the database within the 14615 and 14606 zip codes and include the Eastman Kodak Company, the Weiland Road Landfill (owned by Eastman Kodak Company), Emerson Street Landfill and GMC, Rochester Products Division. Information for these sites is detailed in Appendix B.

1.2.2.4 Chemical Use and Waste Management History

KeeLox Manufacturing Company, Burroughs Corporation, and NuKote International have manufactured carbon copy paper, printer ribbons and other office supply products at the site at various times since 1968. Operations consisted largely of inking and coating processes which apply pigments to various types of substrates. The pigments are applied in solvent-based ink formulations onto the desired substrate, and volatile solvents are removed in drying ovens. Primary solvents used in these operations by KeeLox Manufacturing, Burroughs Corporation and NuKote International are IPA, MEK, toluene and methanol. The solvents have been stored principally in USTs in the past; they are currently stored in underground tanks that are contained in a concrete vault. Carbon black, pigments and other miscellaneous solvents and chemicals were also used by these companies. Hazardous substances are stored, along with hazardous wastes, in a storage area specifically designed to accumulate these materials. The 1986 Annual Hazardous Waste Generator Report indicates 50 tons per year of F005 waste (non-specific spent non-halogenated solvents) and 3 tons per year of D001 waste (characteristic of ignitable wastes consisting of fiber disposable ink filters and cleaning rags) were generated and disposed in an off-site treatment, storage and disposal facility. The 1986 Generator Report is a good representation of historical consumption. Historic records indicate that hazardous wastes were shipped off-site to various RCRA treatment, storage and disposal facilities.

1.2.2.5 UST Removal History

In 1986, a newly formed corporate environmental management group within Burroughs Corporation initiated a comprehensive environmental assessment of the property to determine whether former operations at the facility had impacted soil and/or groundwater conditions. This assessment covered numerous chemical and waste handling issues but focused on the investigation of five USTs which stored virgin chemical products used in manufacturing processes. These USTs were installed in 1969. The USTs were selected for detailed investigation due to an IPA spill, which occurred in January 1985. Immediately following the spill, Burroughs Corporation installed a recovery well to 14 feet below ground surface (BGS) and pumped groundwater from April through June 1985. In total, 330 gallons of fluid were recovered from this well.

The USTs were removed in November 1986 and soil samples were collected from the excavation. The locations of the former USTs are provided on Figure 2. The analytical results associated with the soil samples collected from the base of the excavation and stockpiled materials are summarized in Table 1 and Figure 4. The laboratory reports for these samples are provided in Appendix C. These results indicated that concentrations of IPA up to 63,080 milligrams per kilogram (mg/kg), toluene up to 5,100 mg/kg, MEK up to 260 mg/kg and methanol up to 13 mg/kg were present in the soils surrounding and beneath the USTs. After soil sampling and tank removal, the excavation was then backfilled with the excavated soils and brought to grade with clean fill. The tank area was later repaved.

At the same time the original tanks were removed in 1986, a new tank farm system was installed. This new tank farm system, which consisted of four 5,000-gallon, double walled tanks with leak detection systems, was installed approximately 50 feet from the former tanks in a separate excavation. The new tanks stored IPA, MEK and toluene. NuKote International removed these new tanks in May 1991 as a result of a lease requirement. Replacement tanks were located and installed in vaults on the west side of the facility.

1.2.3 Previous Investigations

Several investigative activities were initiated at the site in response to the 1986 UST removal and associated soil sampling results. These investigations include environmental studies performed by Geraghty & Miller (G&M) in 1987 and 1988, Dames & Moore (D&M) in 1989 and Hydro Soil Technology, Inc. in early 1990. Each of the above investigations is detailed in the following four documents:

- Investigation of Ground-Water Quality Conditions at the Burroughs Office Products Division (Geraghty & Miller, Inc., 1987)

- Investigation of Ground-Water Quality Conditions at the NuKote International (formally Burroughs, Inc.) Facility, Rochester, New York - Phase II (Geraghty & Miller, 1988)

- Report on Monitoring Well Sampling and Analysis (Dames & Moore, 1989)

- The Soil Gas Survey and Soil Borings with Analytical Analyses of Ground-Water and Soil Samples (Hydro Soil Technology, Inc., 1990)

In addition, Unisys conducted Target Compound List (TCL) analysis on select monitoring wells. TCL analyses were performed on 12 monitoring wells in order to formally establish the compounds of interest. The results of this investigation are captured in the data validation report entitled Quality Assurance Review (Environmental Standards, Inc., 1990).

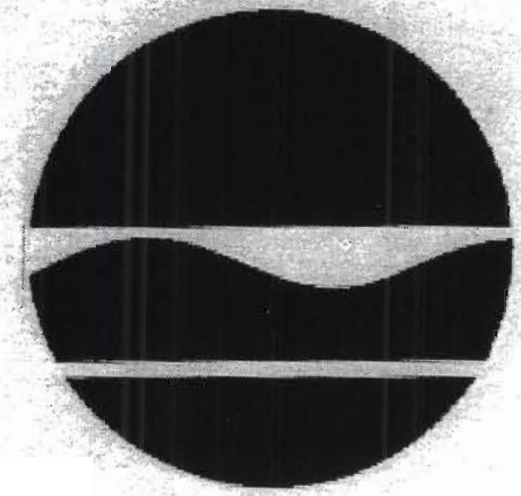
These above investigations are summarized in the subsections that follow.

1.2.3.1 Investigation of Ground-Water Quality Conditions at the Burroughs Office Products Division (Geraghty & Miller, Inc., 1987)

The first phase of investigation at the site consisted of the installation of nine monitoring wells in order to determine the geology, groundwater flow direction and potential sources of groundwater contamination. Six overburden wells from 18 to 20 feet BGS and three shallow bedrock monitoring wells (38 feet BGS) were installed. The wells are designated as GM-1, GM-1D, GM-2, GM-2D, GM-3, GM-3D and GM-4 through GM-6. The locations of these wells are provided on Figure 5. Groundwater samples were subsequently collected from the wells for analysis for VOCs, methanol, IPA and total petroleum hydrocarbons (TPHs).

The results of this investigation are provided in G&M's July 1987 report which is included in Appendix D. In summary, the site directly overlies a veneer of glacial overburden. This is underlain by a thin layer of Gimbsy Shale followed by the Irondequoit Limestone Formation. As will be discussed in Section 3.0, the overburden is believed to overlie the Rochester Shale, when present, and not the Gimbsy Shale as this study had concluded.

Groundwater flow in the overburden zone is to the northeast and in the bedrock is to the northwest. IPA and acetone were detected in the groundwater in concentrations of up to 20,000,000 ug/L and 1,700,000 ug/L, respectively, in the overburden. These



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

RECORD OF DECISION

BURROUGHS-UNISYS

SITE #8-28-075

CITY OF ROCHESTER, MONROE COUNTY

March 1994

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

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

March 22, 1994
Date

Ann Hill DeBarbieri
Deputy Commissioner

TABLE OF CONTENTS

RECORD OF DECISION

BURROUGHS-UNISYS
Rochester, Monroe County, New York
Site No.8-28-075
March 1994

SECTION 1: SITE LOCATION AND DESCRIPTION

The Burroughs- Unisys Site is listed on the New York State Registry of Inactive Hazardous Waste Disposal Sites as a class two site. A class 2 designation indicates that the site poses a significant threat to the environment and/or public health and action is required. The New York State Departments of Environmental Conservation (NYSDEC) and Health (NYSDOH) work together to implement remedial programs for sites listed on the registry.

As shown in Figures 1 and 2, the Burroughs-Unisys Site is located at 1227 Ridgeway Avenue, just west of Mt. Read Boulevard. The four acre site contains an active manufacturing facility which produces typewriter ribbons. The site is in a commercial/industrial area, however, residential properties are located approximately ½ mile west along Ridgeway Avenue. The entire area is serviced by public water and sewers provided by Monroe County.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

The Unisys Corporation (formerly Burroughs Corporation) leased the industrial facility from Frank Dimino, Inc. between 1976 and 1987. The facility was utilized to manufacture carbon paper, printer ribbons and other office supply products. In 1987, Unisys sold the manufacturing operation to Nu-Kote International. Presently Nu-Kote conducts similar manufacturing operations at the site. As part of the sale agreement to Nu-Kote, Unisys agreed to conduct an environmental assessment. The assessment indicated that underground storage tanks at the facility had leaked chemicals into the soils beneath the facility's parking lot, contaminating subsurface soils and shallow groundwater. The five underground tanks were removed in 1986. Analytical results of soil samples collected below the tanks indicated the presence of Isopropyl alcohol (IPA), Methyl Ethyl Ketone (MEK), methanol and toluene (see Table 1 for summary of initial soil concentrations).

2.2: Remedial History

Because of the findings of the environmental assessment and the tank removal, Unisys conducted a groundwater investigation in 1987. The investigation revealed extensive groundwater contamination near the former tank areas (see Table 2 for a summary of initial concentrations). Based on the information, the NYSDEC listed the site on the Registry of Inactive Hazardous Waste Sites.

In 1988, 1989, and 1990 Unisys conducted additional studies to determine the extent and magnitude of the subsurface soil and groundwater contamination. Table 2 shows a summary of the groundwater data collected during that time period. Of interest is that acetone concentrations in both soil and groundwater were not detected during the initial investigations but increased over time. It is speculated that acetone is either a breakdown product of IPA or was unknowingly stored in one of the former underground storage tanks.

2.3 Interim Remedial Measure RCH/009534

Acting under a Consent Order negotiated with the NYSDEC, Unisys designed and implemented an Interim Remedial Measure (IRM) at the site.

An IRM is conducted at a site when a source of contamination and/or exposure pathway can be effectively addressed before completion of an RI/FS. The IRM was implemented to mitigate contamination derived from leaking underground storage tanks.

In November 1990, the IRM was implemented and is presently operational. The IRM consists of a Groundwater/Soil Vapor Extraction (GW/SVE) system (see Figure 2). The GW/SVE system is designed to remove contaminants from both the groundwater and soil by use of a strong vacuum. The contaminants are withdrawn from a series of extraction wells placed in and around the former underground storage tank area. The extracted waters are then treated biologically prior to release to the local sewer authority. The vapor is released without treatment due to the low concentration of contamination in the vapor phase. The IRM system is still operational and over the last 3 years, the system has removed over 5000 pounds of contamination.

SECTION 3: CURRENT STATUS

Unisys Corporation agreed to initiate a Remedial Investigation/ Feasibility Study (RI/FS) in November 1991 to evaluate the effectiveness of the IRM and to address the potential for contaminant migration off-site.

3.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

The RI was conducted in two phases. The first phase was conducted during the summer of 1992 and the second phase during the spring of 1993. A report entitled Remedial Investigation Report, dated November 1992, Addendum I, dated February 12, 1993 and Addendum II, dated May 3, 1993 has been prepared describing the field activities and findings of the RI in detail. A summary of the RI follows:

The activities performed as part of the RI included background research, a literature review and field investigation activities. The background review included regulatory history and permit status of the site, well inventory records within a 1-mile radius of the site, ecological information, underground storage tank removal information, on- and off-site utility locations and historic chemical use and waste management practices. Field investigative activities conducted under the RI included monitoring well installation, groundwater sampling, soil boring completion and subsurface soil sampling, IRM system operation and subsequent depth to water measurements, topographic surveying, sanitary and storm sewer sampling and laboratory analysis. The mobility and toxicity of identified chemical compounds were also evaluated and a baseline risk assessment was prepared.

The analytical data obtained from the RI was compared to applicable Standards, Criteria, and Guidance (SCGs) in determining remedial alternatives. Groundwater, drinking water and surface water SCGs identified for the Burroughs-Unisys site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and 10 NYCRR Part 5. For the evaluation and interpretation of soil and sediment analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used to develop remediation goals for soil.

The remedial investigation noted that the IRM has been effective in remediating the site's groundwater and subsurface soils. As noted in Tables 1 and 2, there has been a significant decrease in the site related compounds. However, residual contamination still exists in isolated pockets, "hot spots", in soil at the top of the bedrock zone (10-15 ft. deep) and the groundwater contamination still exists in the overburden unit in the zone surrounding GM-5 (see Figure 2). Based on the results of the RI, it was concluded that the present IRM system is appropriate to remediate the contamination from the former underground storage tank area. Because of some residual contamination, additional work (a focused Feasibility Study) was necessary to determine how to effectively capture the remainder of the site's contamination.

3.2 Summary of Human Exposure Pathways:

The RI included an evaluation of human health risks, both current and probable future scenarios, that are posed by the contamination identified at the site. The health risk assessment evaluates the analytical results from various media (air, soils and groundwater) and identifies how the general public can possibly be exposed to the contamination.

The data from the RI indicated that contaminated soils are present only below the surface. Because the site is paved, little public exposure to these soils would be possible. Contaminated groundwater does exist in the area of GM-5; however, the entire area is serviced by public water supplies from Monroe County and a survey of local property owners indicates no uses of local groundwater. As such, with the implementation of the IRM, there is no present public exposure to site contaminants.

There are some hypothetical future land use scenarios which could cause possible exposure, including subsurface excavation for construction purposes and possible future municipal and industrial uses of groundwater. Although the extent of the residual contamination is limited and the possibility of the use of local groundwater is unlikely, the assessment does indicate the need to complete the remedial action at the site.

3.3 Summary of Environmental Exposure Pathways:

The site is located in a highly industrial/commercial setting, which lacks any significant wildlife habitat. Further, the extent of contamination is confined to the soils and groundwater below the surface. As such, there are no significant environmental exposure pathways at risk from the contamination identified at the site.

SECTION 4: ENFORCEMENT STATUS

The NYSDEC and the Unisys Corporation entered into a Consent Order on February 12, 1990. The Order obligates the Unisys Corporation to implement an IRM and a RI/FS remedial program. Upon issuance of the Record of Decision the NYSDEC will approach the responsible parties to implement the selected remedy under an Order on Consent.

Order on Consent

Date February 12, 1990

Subject In the matter of Development and Implementation of an Interim Remedial Measure and a Remedial Investigation, Feasibility Study for an Inactive Hazardous Waste Disposal Site, pursuant to Article 27, Title 13 of the Environmental Conservation Law.

Index B8-0262-89-03, Site No. 8-28-075

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6NYCRR 375-1.10. These goals are established under the guideline of meeting all Standards, Criteria, and Guidance (SCGs) and protecting human health and the environment.

At a minimum, the remedy selected, through the proper application of scientific and engineering principles, should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site.

The goals selected for this site are:

- Reduce, control, or eliminate the contamination present within the soils on site.
- Mitigate the impacts of contaminated groundwater to the environment and provide the attainment of SCGs for groundwater to the extent technically practicable.
- Prevent, to the extent practicable, migration of contaminants.

- Provide for attainment of SCGs for soil which is protective of groundwater quality at the limits of the area of concern to the extent technically practicable.

- The Remedial Action Objectives (RAOs) are presented on Table 3.

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the Burroughs-Unisys site were identified, screened and evaluated in a two phase Feasibility Study. This evaluation is presented in the report entitled Feasibility Study, Burroughs-Unisys Facility, dated August 6, 1993.

The results of the first phase Feasibility Study indicated that the present IRM (groundwater/soil vapor extraction) system is more appropriate to mitigate the remaining site than more traditional remedial measures (e.g., excavation and off-site disposal). As such, the second phase of the Feasibility Study was focused on the existing IRM system and what modifications and/or enhancements to the system would remediate the remaining site contaminants to appropriate SCGs.

6.1: Description of Alternatives

The potential remedies are intended to address the contaminated subsurface soils and groundwater.

1. No Action:

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires shutdown of the IRM and the site to remain in a partially remediated state.

This is an unacceptable alternative as the site would remain in its present condition, and human health and the environment would not be adequately protected.

2. Limited Action:

This alternative would include shutdown of the IRM system with long-term periodic monitoring of groundwater.

Present Worth:	$	105,000
Capital Cost:	$	0
Annual O&M:	$	25,000
Time to Implement		5 years

3. Continued Operation of the IRM System:

This alternative would involve continued operation of the existing IRM system until SCGs are achieved. The alternative would include quarterly groundwater and monthly IRM system sampling.

Present Worth:	$	129,170
Capital Cost:	$	0
Annual O&M:	$	140,000
Time to Implement		1 year

4. Cycling of the System and Temporary Hook-Up of Monitoring Wells to the GW/SVE System:

This alternative involves modification to the operation of the present IRM system. It would include continued operation of the IRM with cycling of the various arms of extraction system. The alternative also includes temporary hook-up of existing monitoring wells and more frequent groundwater sampling than Alternative 3.

Present Worth:	$	190,600
Capital Cost:	$	2,000
Annual O&M:	$	200,000
Time to Implement		1 year

5. Continued operation of the existing IRM System with enhancements and modifications:

This alternative is similar to alternative # 4 as it includes system cycling and the temporary hook-up of existing monitoring wells. The alternative also includes the installation of three additional extraction wells to capture "pockets" of the residual contamination. These three wells would be screened to remediate the distinct top-of-rock interval. Further, to possibly assist the remediation, air and/or water injection would be evaluated in the design phase.

Present Worth:	$	199,170
Capital Cost:	$	20,000
Annual O&M:	$	190,000
Time to Implement		1 year

6.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

The No Action (#1) and Limited Action (#2) alternatives do not meet this criterion because they do not address the site's remaining groundwater contamination. All of the other alternatives meet this criteria.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

The No Action (#1) and Limited Action (#2) alternatives only partially meet this criterion because they do not address the remaining groundwater problems. The remaining alternatives meet this criterion.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared with the other alternatives.

The No Action (#1) and the Limited Action (#2) altenatives only partially meet the criterion. All of the other alternatives meet this criterion.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of alternatives after implementation of the response actions. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

Alternative #5, enhancements /modification, meets this criterion because it adequately addresses the remaining residual contamination. The remaining alternatives do not directly address the residual contamination and only partially address this criterion.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

All the alternatives address this criterion.

6. Implementability. The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personal and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

The No Action (#1) and Limited Action (#2) alternatives only partially meet this criterion. The remaining alternatives meet this criterion.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criterion, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 4.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan are evaluated. A " Responsiveness Summary" was prepared that describes public comments received and how the Department addressed the concerns raised. If the final remedy selected had differed significantly from the proposed remedy, notices to the public would have been issued describing the differences and reasons for the changes. It is the position of the Department that comments received during the public comment period do not indicate a need to change the selected remedy (see appendix A).

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC has selected Alternative 5 as the remedy for this site. Alternative 5 is enhancement and modification of the existing system which includes installation of additional extraction wells.

This selection is based upon the following:

The No Action alternative (#1) and Limited Action (#2) do not meet the threshold criteria because they don't address the residual soil and groundwater contamination. Utilizing the existing IRM system (#3) and alternative #4, system cycling, have concerns with their ability to capture the remaining contamination without the installation of additional extraction wells. Alternative #5, enhancements/ modifications, with its additional extraction wells placed in known "hot spot" areas is the most appropriate choice based on the evaluation criteria.

The estimated present worth cost to implement the preferred remedy is $199,170. The cost to construct the remedy is estimated to be $20,000 and the estimated average annual operation and maintenance cost for 1 year is $190,000.

7.1 Element of the Selected Remedy:

1. Following the signing of the ROD, a remedial design program will be initiated to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Also any uncertainties identified during the RI/FS will be resolved.

2. The proposed remedial action includes the following:

- Continued operation of the existing IRM system with enhancement and modifications to the groundwater/vapor extraction system. These enhancement and modifications include system cycling, evaluation of pulsing of the existing system and an evaluation of either passive air or active water injection to assist mitigation. These modifications will be evaluated in the design phase of the project.

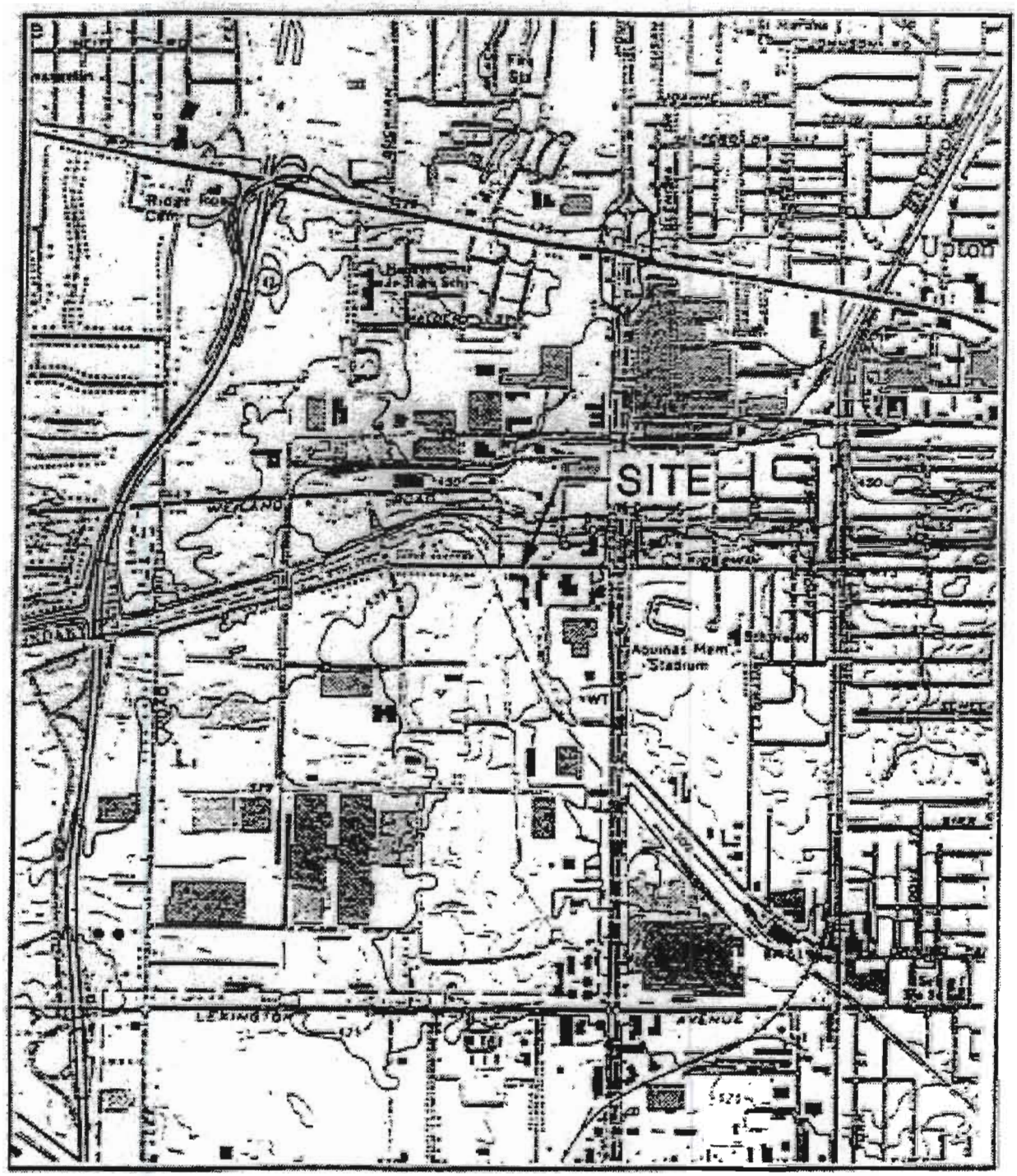
- Temporary GW/SVE connection to existing monitoring wells.

- Installation of three (3) additional extraction wells located at identified pockets of contamination. These wells will be designed to mitigate contamination in the saturated/top-of-rock zone.

- It is recognized by the Department that in light of the low permeability of site subsurface soils, that Groundwater Vapor Extraction is an innovative technology that has the potential with modifications and enhancements to achieve the site RAOs. Further, it is recognized that the groundwater unit under the site is not presently utilized for either industrial or potable purposes and because of the low site permeability any future use of the groundwater appears unlikely.

  As such, the Groundwater Vapor Extraction (GW/VE) system implemented during the Interim Remedial Measure and conceptually modified in the Detailed Analysis of the Feasibility Study will be designed and operated to remediate source area soils and groundwater to the extent technically practicable. The GW/VE system will be modified and/or enhanced and operated for a minimum of one year. After one year, a determination will be made if the system has reached asymptotic conditions with regards to both contaminated vapor and groundwater extractions rates. If the system has reached asymptotic conditions sampling of both the surface soils and groundwater will be conducted to determine if RAOs have been achieved. If either soil or groundwater RAOs are not achieved the system will continue operation and a focused evaluation of further remedial actions will be conducted. The focused study will include an evaluation of no further action.

- If the remedy results in consequential hazardous waste remaining untreated at the site, a long term monitoring program will be instituted. This program will allow the effectiveness of the selected remedy to be monitored. This long term monitoring program will be a component of the operations and maintenance for the site, if appropriate.



RCH/009535

THIS FIGURE IS BASED ON THE ROCHESTER WEST, N.Y. QUADRANGLE U.S.G.S. TOPOGRAPHIC MAP

UNISYS Corporation

Project No. 10011	SITE LOCATION MAP
Project Manager L.S.S.	BURROUGHS - UNISYS FACILITY, ROCHESTER, N.Y.
Date 4-12-93	INTEGRATED ENVIRONMENTAL SOLUTIONS, INC.
Scale 1"=2000'	
Drawn By J.F.B.	Prepared by NTH Consultants, Ltd. — FIGURE 1

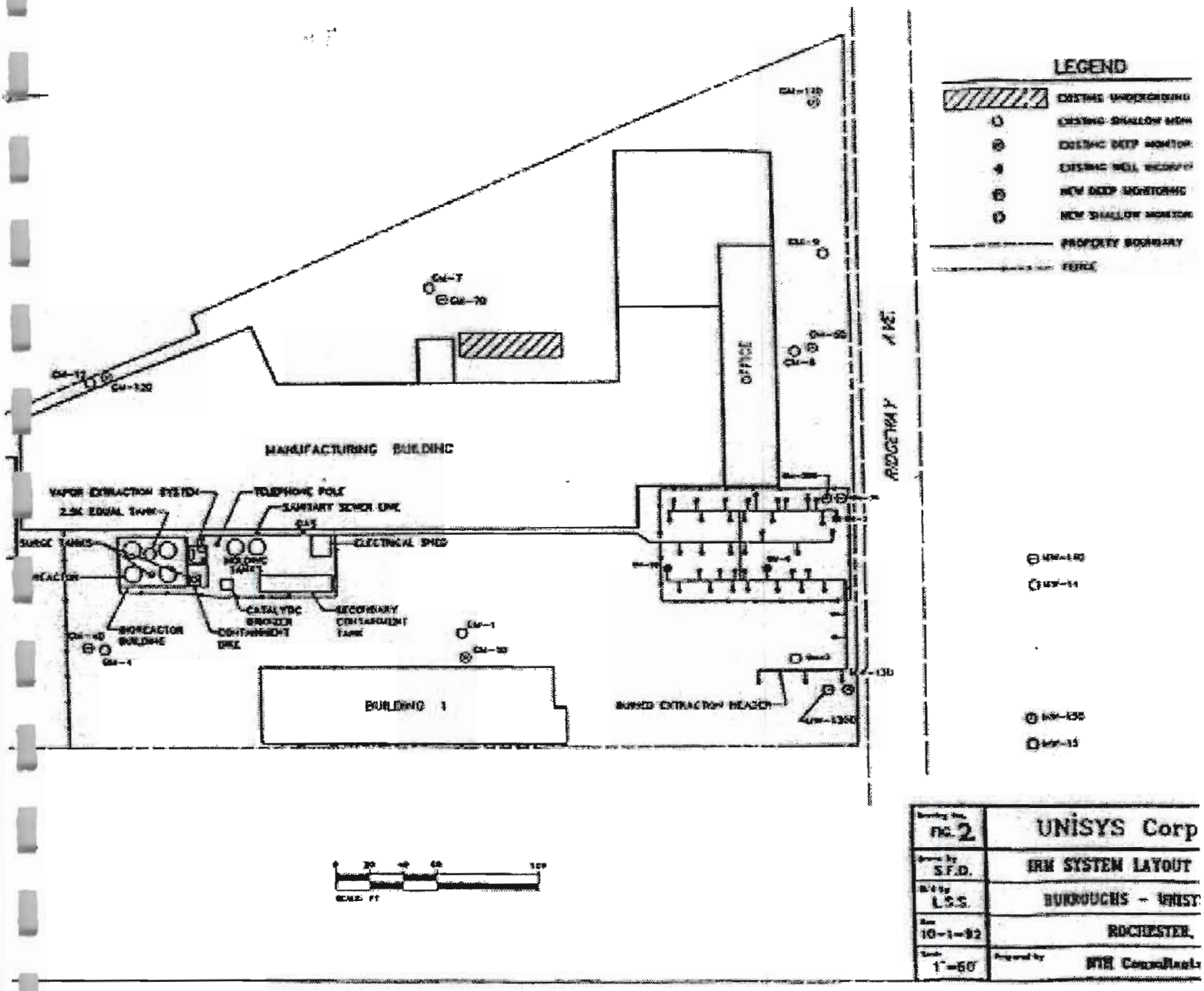


FIG. 2	UNISYS Corp
S.F.D.	IRM SYSTEM LAYOUT
L.S.S.	BURROUGHS - UNISY
10-1-92	ROCHESTER,
1"=60'	Prepared by IRM Consultants

TABLE 1
Burroughs-Unisys, Site #828075
Summary of Soil Results
(results mg/kg)

(Source Area (Former UGST Area))

Site Contaminants	Sampling Date		
	11/86	6/92	11/92
Acetone	ND	93	440
IPA	63,080	ND	2,000
MEK	260	18	ND
Toluene	5,100	1	3.3
Methanol	13	2.1	ND

ND - Not Detected
IPA - Isopropyl Alcohol
MEK - Methyl Ethyl Ketone

TABLE 2
Burroughs-Unisys, Site #828075
Summary of Groundwater Results
(results in ppm)

(Source Area Wells (former UGST))

Site Contaminants	Sampling Date			
	2/87	6/90	6/91	12/92
Acetone	1,700	1,000	33.4	0.17
IPA	20,000	1,000	36.6	ND
MEK	2,200	120	ND	ND
Toluene	4.2	5.6	ND	0.072
Methanol	NA	NA	ND	ND
Total VOCs	21,720	2,000	70	0.17

DOWNGRADIENT (GM - 5)

Site Contaminants	Sampling Data			
	11/87	6/90	6/91	12/92
Acetone	0.43	420	54.6	25
IPA	ND	NA	35.2	ND
MEK	ND	8.5	1.5	ND
Toluene	0.27	2.3	0.72	1.2
Methanol	NA	NA	NA	ND
Total VOCs	0.70	431	92.1	26.2

IPA - Isopropyl Alcohol
MEK - Methy Ethyl Ketone
VOCs - Volatile Organic Compounds
NA - Not Analyzed
ND - Not Detected

TABLE 3
Remedial Action Objectives
Burroughs-Unisys, Site #828075

	SOIL[1] (mg/kg)	Groundwater[2] (ppb)
	0.11	50
	0.11	50
ol	0.11	50
K	0.23	50
e	1.5	5

: Indicator Compounds
lcohol
thyl Ketone

reflect NYSDEC-TAGM-4046," Determination of Soil Clean Up Objectives and Clean Up levels.
ater RAOs reflect SCGs, 10NYCRR Part 5 & 6NYCRR Part 700.

TABLE 4
BURROUGHS-UNISYS, SITE NO. 8-28-075
SUMMARY OF COST

Remedial Alternative	Capital Cost $	Annual O & M $	Present Worth $
1 (no action)	0	0	0
2 (limited action)	0	25,000	105,300
3 (existing IRM)	0	140,000	179,170
4 (system cycling)	2,000	200,000	190,600
5 (enhancements)	20,000	190,000	199,170

O & M - Operation and Maintenance

DECLARATION STATEMENT - RECORD OF DECISION

Burroughs-Unisys Inactive Hazardous Waste Site
City of Rochester, Monroe County, New York
Site No. 8-28-075

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Burroughs-Unisys Inactive Hazardous Waste Disposal Site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Burrough-Unisys Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Burroughs-Unisys Site and the criteria identified for evaluation of alternatives the NYSDEC has selected enhancements/modifications of the existing groundwater/vapor extraction system. The components of the remedy are as follows:

- Continued operation of the existing IRM system with enhancement and modifications to the groundwater/vapor extraction system. These enhancement and modifications include system cycling, evaluation of pulsing of the existing system and an evaluation of either passive air or active water injection to assist mitigation.

These modifications will be evaluated in the design phase of the project.

- Temporary GW/SVE connection to existing monitoring wells.

- Installation of three (3) additional extraction wells located at identified pockets of contamination. These wells will be designed to mitigate contamination in the saturated/top-of-rock zone.

- It is recognized by the Department that in light of the low permeability of site subsurface soils, that Groundwater Vapor Extraction is an innovative technology that has the potential with modifications and enhancements to achieve the site Remedial Action Objectives (RAOs). Further, it is recognized that the groundwater unit under the site is not presently utilized for either industrial or potable purposes and because of the low site permeability and further use of the groundwater appears unlikely.

  As such the Groundwater Vapor Extraction (GW/VE) system implemented during the Interim Remedial Measure and conceptually modified in the Detailed Analysis of the Feasibility Study will be designed and operated to remediate source area soils and groundwater to the extent technically practicable. The GW/VE system will be modified and/or enhanced and operated for a minimum of one year. After one year a determination will be made if the system has reached asymptotic conditions with regards to both contaminated vapor and groundwater extractions rates. If the system has reached asymptotic conditions, sampling of both the surface soils and groundwater will be conducted to determine if RAOs have been achieved. If either soil or groundwater RAOs are not achieved the system will continue operation and a focused evaluation of further remedial actions will be conducted. The focused study will include an evaluation of no further action.

- If the remedy results in consequential hazardous waste remaining untreated at the site, a long term monitoring program will be instituted. This program will allow the effectiveness of the selected remedy to be monitored. This long term monitoring program will be a component of the operations and maintenance for the site, if appropriate.

APPENDIX A

Burroughs-Unisys
Site #8-28-075
Monroe County
Responsiveness Summary
for
Record of Decision
Public Meeting
February 9, 1994
Marshall High School, Rochester, NY

This Responsiveness Summary responds to oral comments received during the February 9, 1994 public meeting. The public comment period opened on January 25, 1994 and closed on February 28, 1994. Written comments were received and a formal response was forwarded. A summary of this response is also included in the responsiveness summary.

Q: Are all of the extraction wells pumping from the top-of-rock zone?

A: The extraction wells installed for the Interim Remedial Measure were placed to the top-of-rock or between 15-20 feet below the surface. The additional extraction wells proposed will be designed to specifically target the top-of-rock zone in areas of remaining residual contamination.

Q: What are the depths of the proposed additional extraction wells?

A: The top-of-rock zone is approximately 15-20 feet below the surface. The additional extraction wells will be placed to this approximate depth.

Q: Is the contaminant plume in the groundwater spreading quickly.

A: The quick actions of the PRPs to implement an IRM have prevented extensive contaminant migration from the former underground storage tank area. The present Groundwater/Vapor Extraction System (GW/VES) creates a draw down in the groundwater table which prevents contaminant migration. As such, the remaining isolated pockets of contamination are not migrating and because of the continued operation of the GW/VES system. In the Remedial Investigation, downgradient monitoring wells were installed and no significant site related contamination was found. This is an indication of limited contaminant migration.

The following concern was received in writing during the public comment period:

Q: As the current occupants of the site we are concerned with the progress of the remedial action.

A: Thank you for your comments on the Proposed Remedial Action Plan for the above referenced site. We understand your concerns for a swift remedial program. The Remedial program outlined in the PRAP will be implemented this summer and is expect to take one year to complete. At the end of one year the site's soils and groundwater will be compared to the clean up objectives. If clean up objectives are met the remediation can be concluded. If the goals are not met additional work may be required.

We have placed your name and address on our site mailing list and will provide you updates of the remedial program through fact sheets and other site mailings. Site related information is also available at the document repository located at Rochester Public Library Ridgeway Avenue.

Q: This is an exceptional situation because the site is flat and an extensive ridge is just north of the site. Has the prominent ridge north of Ridgeway Avenue affected the plume movement and have you looked for contamination below the ridge.

A: There is a significant drop in elevation of almost 200 ft just north of the site. This ridge is reported to be the location of a glacial period lake shore line. The ridge does influence the hydrology of the site most noticeable by the drop in the site's bedrock water table from south to north. However, the bedrock monitoring wells both on-site and downgradient show no significant site related contamination. We do not expect an impact on groundwater quality below the ridge.

Q: What are the concentrations for the Remedial Action Objectives?

A: Two types of Remedial Action objective were developed for the site. The soil and groundwater goals are in the Proposed Remedial Action Plan as Table 3. They are as follows:

TABLE 3
Remedial Action Objectives
Burroughs-Unisys, Site #828075

SSICs	SOIL[1] (mg/kg)	Groundwater[2] (ppb)
Acetone	0.11	50
IPA	0.11	50
Methanol	0.11	50
MEK	0.23	50
Toluene	1.5	5

SSICs - Site Specific Indicator Compounds
IPA - Isopropyl Alcohol
MEK - Methyl Ethyl Ketone

note: [1]Soil RAOs reflect NYSDEC-TAGM-4046," Determination of Soil Clean Up Objectives and Clean Up level
[2]Groundwater RAOs reflect SCGs, 10NYCRR Part 5 & 6NYCRR Part 700.

APPENDIX B
Adminstrative Record
Burroughs-Unisys, Site #828-075
City of Rochester, Monroe County

- Record of Decision, Burroughs-Unisys, Site # 8-82-075, March 1994.

- Proposed Remedial Action Plan, Burroughs Unisys, Site #8-28-075 , January 1994.

- Public Meeting Announcement, Burroughs-Unisys Inactive Hazardous Waste Site, Site #8-27-075, City of Rochester, Monroe County, dated January 24, 1994.

- Public Meeting Announcement, Burroughs-Unisys Inactive Hazardous Waste Site, Site #8-28-075, City of Rochester, Monroe County, dated January 24, 1994.

- Letter to Keith Rapp, Unisys Corporation from David A. Crosby, NYSDEC, subject, Burroughs-Unisys, Site #828075, Monroe Co. - Approval of Remedial Investigation-Feasibility Study, dated December 21, 1993.

- Report, Feasibility Study, Burroughs-Unisys Facility, Rochester, New York, Site #828075, prepared by Integrated Environmental Solutions, Inc., dated August 6, 1993.

- Report, Preliminary Screening Document Feasibility Study for Burroughs/Unisys Site Rochester, New York, prepared by Integrated Environmental Solutions, Inc., dated May 3, 1993.

- Report Addendum II Remedial Investigation Report, Burroughs-Unisys Site #828075, Rochester, New York, prepared by Integrated Environmental Solutions Inc., dated May 3, 1993.

- Press release, Public Meeting set on Hazardous Waste Site in Rochester, dated April 14, 1993.

- Fact sheet/meeting announcement, Burroughs Unisys, Site #828075, Rochester, Monroe County, New York, dated April 14, 1993.

- Report, Addendum, Remedial Investigation Report, Burroughs-Unisys Site #828075, prepared by Integrated Environmental Solutions Inc., dated February 12, 1993.

- Report, Addendum, Remedial Investigation Report, Burroughs-Unisys Site #828075, prepared by Integrated Environmental Solutions Inc., dated February 12, 1993.

- Report, Remedial Investigation Report, Burroughs-Unisys Site, Rochester, New York, NYSDEC Site No. 828075, Volumes 1 through 17, prepared by Unisys Corporation, dated November 2, 1992.

- Letter to Kevin Earley, Unisys Corporation from David A. Crosby, NYSDEC, subject, Burroughs-Unisys, Site #828075, Monroe Co.-Removal of IRM System Air Controls, dated October 15, 1991.

- Letter to Mr. Kevin Earley, Unisys Corporation from David Crosby, NYSDEC, subject, Burroughs-Unisys, Site #828075, Monroe Co., Approval of RI/FS work plan, dated October 2, 1991.

- Report, Revised RI/FS Management Plan, Unisys-Nukote Rochester New York, prepared by Bruck, Hartman & Esposito, Inc., dated July 25, 1991.

- Report, Air Control Considerations for the Soil Vapor/Groundwater Extraction Process at the Unisys/Nu-Kote International Site in Rochester, New York, prepared by Environmental Standards, Inc., dated July 9, 1991.

- Fact Sheet, Burroughs-Unisys, Site #828075, Monroe County, dated March 22, 1991.

- Letter to Kevin Earley, Unisys Corporation from David A. Crosby, subject, Burroughs-Unisys, Site #828075, Monroe County-Approval of the Interim Remedial Measures Work Plan, dated December 7, 1990.

- Letter to Kevin Earley, Unisys Corporation from Michael B. Schifano, Monroe County Department of Public Works, subject, Discharge Conditions Nu-Kote/Unisys Facility, dated October 25, 1990.

- Report, The Soil Gas Survey and Soil Borings Analytical Analysis for Nu-Kote International Facility, prepared by Hydro Soil Tech, Inc., dated April 26, 1990.

- Order on Consent, Index #B8-0262-89-03, Site #828075, in the matter of the Development and Implementation of an Interim Remedial Measure and a Remedial Investigation/Feasibility Study for an Inactive Hazardous Waste Disposal Site Pursuant to Article 27, Title 13 of the Environmental Conservation Law of the State of New York by Unisys Corporation, Respondent, dated February 12, 1990.

- Memorandum, to David Markell, Director, DEE from Michael O'Toole, Director, DHWR, Sub: Referral of Burroughs-Unisys Site, dated March 17, 1989.

- Memorandum, to Michael O'Toole, Director, DHWR from Mike Khalil, Regional Hazardous Waste Remediation Engineer, Sub: Referral of Burroughs-Unisys to Division of Environmental Enforcement, dated February 23, 1989.

- Letter, to Unisys Corporation form Kernan Davis, Acting Director, Bureau of Hazardous Site Control, DHWR, NYSDEC, Subject Notice of Site Inclusion on the Registry of Inactive Hazardous Waste Disposal Sites, January 17, 1989.

wp51\ra:app-ra5a.bur

Investigation of Ground-Water Quality Conditions at the Nu-Kote International (Formally Burroughs, Inc.) Facility Rochester, New York -Phase II-

July, 1988

Geraghty & Miller, Inc.
Ground-Water Consultants
125 East Bethpage Road
Plainview, New York 11803

CONTENTS

TABLES

FIGURES

Based upon the potentiometric surface shown in Figure 5, the VOCs detected in well GM12D appears to result from an off-site source upgradient of the site. The contaminants detected in well GM4D may also result from an off-site source, however, there is sufficient data to categorically determine the source of these contaminants. The VOCs detected in well GM3DD are just above the detection limit for the compounds detected.

Since no acetone has been stored or used at the site, the presence of acetone in the aquifer has been attributed to biodegradation of isopropanol in the subsurface. The biodegradation pathway for isopropanol proceeds through acetone to carbon dioxide. Under certain biochemical conditions acetone will accumulate.

2-Butanone (MEK) were found in wells GM8 and GM10 (13,000 and 2,200,000 ppb) respectively.

Aromatic hydrocarbons (benzene, chlorobenzene, and toluene) were detected in both overburden and bedrock wells and are distributed over a large portion of the site in the overburden. The most significant occurrences of aromatic hydrocarbons are chlorobenzene at 110 ppb in well GM7 and toluene at 270 ppb in well GM5 and at 1600 ppb in well GM8.

UNISYS

1998 Annual Monitoring Report

Former Burroughs/Unisys Facility
Ridgeway Avenue Site
Rochester, New York

NYSDEC Site #8-82-075

April 30, 1999

Prepared for:
New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road, Remedial Section C
Albany, New York 12233-7010

Prepared by:

UNISYS
Corporate Environmental Affairs
3199 Pilot Knob Road
Eagan, MN 55121

Table of Contents
1998 Annual Monitoring Report

Figures

Appendices

1998 Annual Monitoring Report
Former Burrough-Unisys Facility
1225 Ridgeway Avenue
Rochester, New York

NYSDEC Site #8-28-075

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to provide the New York State Department of Environmental Conservation (NYSDEC) with a status of the groundwater monitoring program and decommissioning of the Groundwater/Soil Vapor Extraction (GW/SVE) treatment system at the Former Burroughs-Unisys Facility located at 1225 Ridgeway Avenue, Rochester, New York. The GW/SVE treatment system was shut-down on March 25, 1997. NYSDEC approved the system shut-down and selected the **monitoring only** alternative for the site as recommended in the *Focused Evaluation of Remedial Alternatives Report* (Unisys, October 15, 1997).

1.2 SITE LOCATION AND DESCRIPTION

The Former Burroughs-Unisys facility is located at 1225 Ridgeway Avenue, Rochester, New York. The location of the site is shown on Figure 1. The area surrounding the site is primarily zoned industrial/commercial. The site is bounded to the north by a large parcel owned by Eastman Kodak Company, to the east by commercial business, to the south and southwest by undeveloped parcels owned by 3M Corporation, and to the west by a parcel owned by Dimino Management, Inc.

The site plan is illustrated in Figure 2. The Ridgeway Avenue site consists of a manufacturing building, office building and a warehouse/storage building. Several businesses currently occupy these buildings and include NuKote International, Envotech, Inc., AAC Contracting, Inc., and SeaLand Contractors. In addition, the Acropolis Restaurant is located within the property boundary. The site is mostly covered with asphalt, concrete or buildings, with only a few small, grassy areas. The location of buildings, treatment system, roadways, and the monitoring wells and GW/SVE system are also shown on Figure 2.

1.3 SITE HISTORY

Since the beginning of industrial activity at this site in 1968, solvents have been used for manufacturing carbon copy paper, printer ribbons and other office supply products. Burroughs-Unisys manufactured these products at this facility from 1976 to 1986. Although Burroughs sold the business operations in 1986 to NuKote International, similar manufacturing operations and chemical use continued at this facility. A detailed discussion of the property including ownership and lease agreements is presented in the *Remedial Investigation Report* (Unisys, 1992).

Primary solvents used in the manufacturing process included isopropyl alcohol (isopropanol or IPA), methyl ethyl ketone (2-butanone or MEK), toluene and methanol. These solvents were stored in underground storage tanks (USTs) in the northeast corner of the site. Historical records and environmental investigations revealed that between 1986 and 1992, IPA, methanol, MEK, and toluene were the only chemicals stored in the former USTs, which impacted soil and groundwater beneath the site by 1985. These are four of the five contaminants identified in the ROD as SSICs, and used for the RAOs for soil and groundwater. Acetone, the fifth SSIC, was not stored at the facility. The presence of acetone has been attributed to subsurface biodegradation of IPA (Geraghty & Miller, 1988).

1.4 REMEDIAL SYSTEM STATUS

The Record of Decision (ROD) (NYSDEC, March 1994) identified a remediation plan after evaluating and approving the Remedial Investigation/Feasibility Study (RI/FS). NYSDEC selected enhancements and modifications (Alternative 5 in the ROD) to the Interim Remedial Measures (IRM) GW/SVE system. In cooperation with NYSDEC, Unisys presented the Remedial Design (RD) in response to the ROD (Unisys, March 1995).

The selected remedial alternative included continued operation of the IRM with documented modifications that included installation of five additional GW/SVE wells, and enhancements that included cycling, evaluation of pulsing, and evaluation of passive air or active water injection to assist fluid migration. The wells (SV-41 through SV-45) shown on Figure 2, were added to the existing network on May 16, 1995, and the system was restarted on May 30th. After being restarted, the system operated on a cycling and pulsing schedule designed to enhance the remediation of previously identified areas impacted by VOCs. The GW/SVE treatment system was shut-down on March 25, 1997. In the fall of 1998, the GW/SVE treatment system was decommissioned under the supervision of Day Environmental, Inc. (DAY) of Rochester, New York. Staff at DAY served as the on-site GW/SVE treatment system operators between November 1990 and March 1997. The decommissioning was supervised by DAY and the demolition report is included as Appendix D to this report.

1.4.1 REMEDIAL ACTION OBJECTIVES

The soil RAOs which are stated in the ROD reflect the NYSDEC-TAGM-4046 *Determination of Soil Clean Up Objectives and Clean Up Level.* The groundwater RAOs reflect SCGs, 10NYCRR Part 5 and 6NYCRR Part 700. For the SSICs they are as follows:

SSIC	Soil RAO (ppm)	Groundwater RAO (ppb)
Acetone	0.11	50
Isopropyl Alcohol	0.11	50
Methanol	0.11	50
Methyl Ethyl Ketone	0.23	50
Toluene	1.5	5

Remedial Action Objective Soil Concentrations using TAGM 4046

Site-specific, risk-based soil cleanup numbers were established by Environmental Standards, Inc. (ESI), and presented in the *Feasibility Study* (IES, August 1993). Three scenarios were presented for soil concentrations. The most conservative of these was calculated using the Trench Utility Worker Scenario and 1/2 the threshold limit value (TLV) as the maximum allowable air concentration in the trench. The criteria used to establish the action level was a health index (HI) of 1, which is the level of exposure to a specific compound from all significant pathways below which it is unlikely for even a sensitive population to experience adverse health affects.

In the same document, site-specific, risk-based groundwater concentrations were determined for the facility, and it was determined the compound-specific cleanup concentrations for groundwater by setting a HI of 1 (IES, August 1993). The risk-based assessment included ingestion, dermal contact and inhalation of volatile organics from water use in the home as potential exposure pathways by using the very conservative assumption that the shallow groundwater could be used as a potable drinking water source. This is very unlikely because of the very low yield of the aquifer (see the Record of Decision, NYSDEC, March 1994).

The following table presents the risk-based concentrations for the most conservative soil scenario and the overburden groundwater. Although NYSDEC, in the Record of Decision, did not adopt the conservative risk-based standards as the site RAOs, they are presented here as a reference for determining the risk to human health posed by residual concentrations of SSICs. All of the compounds of interest have very low toxicity characteristics and, as a result, have high exposure tolerance levels.

SSICs	Soil (ppm)	Overburden Groundwater (ppb)
Acetone	170	8,900
Isopropyl Alcohol	140	2,500
Methanol	44	10,000
Methyl Ethyl Ketone	180	3,300
Toluene	600	1,900

Risk-Based Action Levels for Soil and Groundwater

2.0 1998 ACTIVITIES

As mandated by Section 27-1305 of the Environmental Conservation Law (ECL), NYSDEC maintains a Registry of all Inactive Hazardous Waste Disposal Sites. Effective January 8, 1999, the Classification for this release has been changed from Class II to Class IV site. The reason for the re-classification is the site soil has been successfully remediated by the GW/SVE system, and one small are of groundwater contamination on-site persists downgradient of the former UST area. A long-term monitoring program has been implemented. The objective of the post-remediation groundwater monitoring program is to collect the appropriate data concerning the groundwater conditions at and downgradient of the former UST basin which served as the source for the groundwater plume in the overburden and bedrock formations at the site. The goal of the post-remediation groundwater monitoring program is to demonstrate the remedial actions and water quality conditions are protective of the soil and groundwater conditions of the state of New York.

2.1 WELL ABANDONMENT PROGRAM

The well abandonment program removed the wells not in the long-term monitoring program (all of the groundwater monitoring, soil vapor extraction, and other wells in the table below) located on-site. These wells were abandoned in November 1998, as identified in the table below, and summarized in Appendix D, Section 7.

Location	Date Abandoned	Location	Date Abandoned	Location	Date Abandoned	Location	Date Abandoned
GM-1	18-Nov-98	SVE-1	18-Nov-98	SVE-15	20-Nov-98	SVE-33	24-Nov-98
GM-1D	18-Nov-98	SVE-2	18-Nov-98	SVE-16	20-Nov-98	SVE-34	25-Nov-98
GM-2	17-Nov-98	SVE-3	18-Nov-98	SVE-17	25-Nov-98	SVE-35	24-Nov-98
GM-2D	17-Nov-98	SVE-3A	18-Nov-98	SVE-18	25-Nov-98	SVE-36	25-Nov-98
GM-3DD	20-Nov-98	SVE-4	18-Nov-98	SVE-19	25-Nov-98	SVE-37	25-Nov-98
GM-4	17-Nov-98	SVE-5	18-Nov-98	SVE-20	25-Nov-98	SVE-38	25-Nov-98
GM-4D	17-Nov-98	SVE-5A	18-Nov-98	SVE-22	24-Nov-98	SVE-39	25-Nov-98
GM-6	19-Nov-98	SVE-6	18-Nov-98	SVE-23	24-Nov-98	SVE-40	25-Nov-98
GM-6D	19-Nov-98	SVE-6A	18-Nov-98	SVE-24	24-Nov-98	SVE-41	25-Nov-98
GM-7	18-Nov-98	SVE-7	18-Nov-98	SVE-25	24-Nov-98	SVE-42	25-Nov-98
GM-7D	18-Nov-98	SVE-8	19-Nov-98	SVE-27	24-Nov-98	SVE-43	25-Nov-98
GM-9	23-Nov-98	SVE-9	20-Nov-98	SVE-28	24-Nov-98	SVE-44	25-Nov-98
GM-10D	23-Nov-98	SVE-10	20-Nov-98	SVE-29	24-Nov-98	SVE-45	20-Nov-98
GM-11D	20-Nov-98	SVE-11	20-Nov-98	SVE-30	24-Nov-98	X	25-Nov-98
MW-16	19-Nov-98	SVE-12	20-Nov-98	SVE-31	24-Nov-98	C-1	23-Nov-98
MW-16D	19-Nov-98	SVE-14	20-Nov-98	SVE-32	24-Nov-98	C-2	23-Nov-98

2.2 SITE GEOLOGY

Pleistocene-age glacial lake sediments composed predominantly of brown-to-tan clayey silt with occasional fine sand overlie shale and limestone bedrock. These sediments generally range in thickness from approximately 10 to 20 feet. The Irondequoit Limestone Formation underlies the overburden and consists of interbedded dark gray-to-black calcareous shale, and gray-to-light gray dolomite and crystalline limestone. A thin weathered portion of the Rochester Shale Formation was identified above the limestone. The shale appears to be present across most of the site with a maximum thickness of approximately five feet. Bedrock is reported to have a slight regional dip to the south. On-site, the bedrock surface slopes to the east with bedrock highs to the north and west.

2.3 SITE HYDROGEOLOGY

Two hydrogeologic units have been identified and monitored at the site for 12 years. These include a water bearing zone in the overburden clay and silt, and bedrock aquifer comprising of the Irondequoit Formation. Eight (8) monitoring wells are currently used for monitoring groundwater quality and water level measurements. The wells are shown on Figure 3. Wells have been designated as "shallow" for those screened in overburden and "deep" for those in bedrock. Historical groundwater elevation data are presented in Appendix A.

Historical and recent water level monitoring have shown that the saturated thickness is greater in the southern portion of the property than in the north. Hydraulic conductivities in the overburden in the southern half of the site are approximately 50 feet per day (ft/day) based on pumping tests at GM-1. Conductivities in the northern portion of the site are significantly lower, ranging from 0.007 to 2.8 ft/day based on slug tests (Geraghty & Miller, 1988).

The bedrock aquifer is monitored by wells with screened intervals ranging from 25 to 60 feet bgs. Groundwater depths range from 5 feet bgs in the southern portion of the property to 25 feet bgs in the north. Deeper bedrock wells (MW-13DD) have screened intervals from 50 to 60 feet with groundwater depths ranging from 25 to 40 feet bgs indicating a strong downward gradient in the bedrock aquifer. The hydraulic gradient varies from approximately 0.005 in the south and western portions of the site to 0.05 to the northeast. The implementation of the well abandonment program has resulted in the observation network which now only monitors this lower permeability, thinner hydrogeologic zone.

2.4 GROUNDWATER SAMPLING

Figure 3 presents the post-remediation groundwater monitoring network. As part of the GW/SVE system demolition and disposal of the treatment plant components, 67 extraction and monitoring wells were abandoned. Well nests MW-14 and MW-15 were conveyed to Kodak. The wellheads of monitoring wells GM-3, GM-8, and GM-10 were modified (cut-off below grade and equipped with at-grade curb boxes) to allow their use as groundwater monitoring locations along with wells GM-3D, GM-5, MW-13, MW-13D, and MW-13DD, which constitutes the long-term groundwater monitoring network. A summary of the wells abandoned is found in Appendix D, Section 7 of this report.

The post-remediation water quality monitoring locations are listed below:

Location	1998		1999				2000				2001			
	Monthly	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
GM-3	X	X	X	X	X	X		X		X			X	
GM-3D		X	X	X	X	X		X		X			X	
GM-5	X	X	X	X	X	X		X		X			X	
GM-8	X	X	X	X	X	X		X		X			X	
GW-10	X	X	X	X	X	X		X		X			X	
MW-13	X	X	X	X	X	X		X		X			X	
MW-13D	X	X	X	X	X	X		X		X			X	
MW-13DD		X	X	X	X	X		X		X			X	

The 1998 water quality monitoring dates are listed below:

26-January-98
25-February-98
24-March-98
28-April-98
27-May-98
23-June-98
30-July-98
31-August-98
30-September-98
29-December-98

Appendix A presents the historical groundwater elevation summary. The observation network for the long-term groundwater monitoring program is depicted on Figure 3. Figure 4 presents the potentiometric contour map for water levels measured in January 1998, and Figure 5 depicts the potentiometric contour map for water levels measured in February 1998.

Review of potentiometric surface maps generated from 1987 through 1998 show flow in overburden is consistently to the northeast with an approximate hydraulic gradient of 0.005. Well hydrographs, representative of groundwater fluctuations at the site are presented in Appendix B. Head levels in overburden (GM-3) and bedrock (GM-3D) indicates the bedrock and overburden are not as strongly connected hydraulically in the area (Appendix B) downgradient of the former UST area.

2.5 VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER

Historical groundwater quality results are summarized in Appendix C for all monitoring wells in the long-term groundwater monitoring program at the site. Groundwater samples have been analyzed for the SSICs beginning in 1987 through December 1998.

Figure 6 presents the January 1998 groundwater quality sampling for the long-term monitoring wells. This report does not graphically depict the results of each groundwater sampling event, as generally the analytical results depicted positive detections only at monitoring well GM-5 for each sampling event, and at well GM-10 during the February 1998 sampling event (Figure 7). Figure 8 provides the results of the April 1998 sampling event, and Figure 9, Figure 10, and Figure 11 present the results of the June 1998, August 1998, and December 1998, groundwater sampling, respectively.

Toluene was detected during each sampling event at GM-5 throughout 1998, and the only other compound detected at GM-5 was acetone in August 1998.

Location	Date	2- Butanone	Acetone	Isopropanol	Methanol	Toluene	Total VOCs
GM-5	26-Jan-98	< 50	< 50	< 100	< 1000	24	24
GM-5	25-Feb-98	< 50	< 50	< 100	< 1000	79	79
GM-5	24-Mar-98	< 50	< 50	< 100	< 1000	270	270
GM-5	28-Apr-98	< 20	< 20	< 180	< 110	100	100
GM-5	27-May-98	< 20	< 20	< 98	< 110	35	35
GM-5	23-Jun-98	< 67	< 67	< 98	< 110	430	430
GM-5	30-Jul-98	< 40	< 40	< 98	< 110	380	380
GM-5	31-Aug-98	< 40	73	< 100	< 100	290	363
GM-5	30-Sep-98	< 400	< 400	< 100	< 100	600	600
GM-5	29-Dec-98	<100	< 40	< 100	< 100	300	300

VOC concentration versus time graphs for well GM-5 are shown on Figure 12 for Total VOCs (summary of SSIC). Sampling does not indicate a significant increase in VOCs at GM-5 since the GW/SVE system was turned-off (Figure 13). Figure 14 also indicates that VOC levels have not significantly increased with the increase (rebound) in the water table at GM-5. In general, the water table rebound is approximately 5-feet in the center of the cone-of-depression at the former GW/SVE extraction area.

3.0 SUMMARY AND CONCLUSIONS

Based on extensive groundwater monitoring data (collected from 1987 through 1998), and the monitoring of the VOC plume pre- and post-remediation it does not appear that VOCs have migrated from the former UST basin. This result was predicted in the groundwater flow model (Unisys, October, 1997), and the model will be updated in 1999 to reflect current conditions.

Accordingly, the monitoring program will continue on the schedule identified below:

	1999				2000				2001			
Location	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**
GM-3	X	X	X	X		X		X			X	
GM-3D	X	X	X	X		X		X			X	
GM-5	X	X	X	X		X		X			X	
GM-8	X	X	X	X		X		X			X	
MW-10	X	X	X	X		X		X			X	
MW-13	X	X	X	X		X		X			X	
MW-13D	X	X	X	X		X		X			X	
MW-13DD	X	X	X	X		X		X			X	

with the scheduled reporting of annual results as listed below:

1999 Annual Monitoring Report **– May 1, 2000**
2000 Annual Monitoring Report **– April 15, 2001**
2001 Annual Monitoring Report **– February 15, 2002**

4.0 REFERENCES

BHE Environmental, Inc., 1990. *Operation Work Plan for the Interim Remedial Measures, Former Burroughs-Unisys Facility, Rochester, New York.*

BHE Environmental, Inc., 1995. *Remedial Design for Former Burroughs-Unisys Facility, Rochester, New York*, March 10, 1995.

BHE Environmental, Inc., 1996. *Annual Performance Report of Remedial Activities for Former Burroughs Unisys Facility, Rochester, New York,* September 27, 1996.

Dames and Moore, 1989. *Report on Monitoring Well Sampling and Analysis Former Burroughs Unisys Facility, Rochester, New York,*

Geraghty and Miller, Inc., 1987. *Investigation of Groundwater Quality Conditions at the Nu-Kote International facility (Formally Burroughs, Inc., Rochester, New York*

Geraghty and Miller, Inc., 1988. *Investigation of Groundwater Quality Conditions at the Burroughs Office Products Division, Rochester, New York*

Integrated Environmental Solutions, Inc., 1993. *Addendum Remedial Investigation Report for Former Burroughs Unisys Facility, Rochester, New York,*

Integrated Environmental Solutions, Inc., 1993. *Draft Feasibility Study Burroughs Unisys Facility*, August 6, 1993.

Supercomputer Systems Engineering and Services Company (SSESCO), 1997. The savi3D User Guide.

Terra Vac Corporation, 1993. *Pilot Test Report, Former Burroughs Unisys Facility, Rochester, New York*, November 1989

Unisys Corporation, 1997. *Focused Evaluation of Remedial Alternatives, Former Burroughs-Unisys Facility, Rochester, New York*. October 15, 1997.

Unisys, 1992. *Draft Remedial Investigation Report for Former Burroughs Unisys Facility, Rochester, New York.*